Appendix A

Scotts Valley Market Study, Economic Impact Study, and Community and Social Impact Study

Advantage Partners Consulting

Scotts Valley Market Study, Economic Impact Study, and Community and Social Impact Study

Vallejo, CA

July 2024

Prepared for:

Acorn Environmental, and

The Scotts Valley Band of Pomo Indians

Prepared by:

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TABLE OF CONTENTS

DISCLAIMER

Gaming revenue forecasts, pro formas, conclusions, and recommendations made in this report by Advantage Partners Consulting (APC) were based on the Consulting Team's understanding of, and experience working in regional gaming markets across the United States, and the greater Bay Area gaming market, in particular. APC also made certain assumptions about the market, which helped form the basis of its forecasts. Some of those assumptions may not materialize or unanticipated events may occur that may alter the outcome of the forecasts presented in this report. As such, APC and its consulting partners accept no liability with regards to the estimates provided herein.

EXECUTIVE SUMMARY

Acorn Environmental is assisting the Scotts Valley Band of Pomo Indians ("Tribe") in its Land in Trust process with the goal of developing a casino ("Project") on the Tribe's ancestral lands. The Company and the Tribe have identified a suitable parcel of land for development of a casino, related non-gaming amenities, and tribal community functions, approximately 34 miles northeast of San Francisco. The 128-acre site is just off Interstate 80 and Columbus Parkway, within the city of Vallejo.

Advantage Partners Consulting ("APC" or "Consulting Team") was engaged to perform a series of studies to integrate into the Project's Economic Assessment ("EA"). These include a Casino Market Study that will forecast gaming revenue and revenues from other services that the Project will generate, an Economic Impact Study that will measure the impact of the Project in terms of labor, labor income, tax receipts, and total output, a Competitive Impacts Analysis that will measure the impacts that the Project will have on other Tribal casinos in the region, and a Social and Community Impact Study.

For each of the aforementioned tasks, APC was asked to prepare its analysis under three unique development scenarios:

Alternative A – Proposed

Alternative A is the proposed project. It consists of the core development which will include a casino, restaurants, events/multi-purpose space, and associated parking and infrastructure. In addition to the casino complex, a Tribal housing and community development, comprised of 24 single-family residences, necessary infrastructure, and an adjacent Tribal administration building will also be built.

Alternative B – Reduced Intensity Alternative

Alternative B is the Reduced Intensity Alternative. It consists of the core development which will include a casino, restaurants, events/multi-purpose space, and associated parking and infrastructure. It does not include any Tribal housing or Tribal administration building.

Alternative C – Hotel and Commercial Alternative

Alternative C consists of two hotels, two commercial buildings, Tribal housing, and Tribal administration buildings. Specifically, Alternative C includes two hotels, each with 132 lodging units, its own café, and limited meeting space. Tribal housing consists of 40 townhomes. Alternative C does not include a casino or related amenities.

SUMMARY OF RESULTS

ALTERNATIVES A AND B: FORECAST OF GAMING REVENUES

Gaming revenues, win per slot per day, win per table per day, and total annual visits are summarized in the table below.

Five-Year Gaming Performance and Visitation Summary *revenue/visits in millions*	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
Total Net Gaming Revenue	**$ 751**	**$ 835**	**$ 852**	**$ 869**	**$ 886**
Net Slot Revenue	$ 533	$ 593	$ 605	$ 617	$ 629
Slot Units	3,500	3,500	3,500	3,500	3,500
Win Per Slot Per Day	**$ 418**	**$ 464**	**$ 473**	**$ 483**	**$ 492**
Net Table Revenue	$ 218	$ 242	$ 247	$ 252	$ 257
Table Units	130	130	130	130	130
Win Per Table Per Day	**$ 4,592**	**$ 5,102**	**$ 5,204**	**$ 5,308**	**$ 5,414**
Source: APC					

ALTERNATIVES A AND B: PRO FORMA REVENUE FORECAST

The table below summarizes the revenue forecast for first five years of operation for Alternatives A and B.

Alternatives A & B - Pro Forma Revenue Forecast	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
TOTAL GGR	$ 827.1	$ 914.7	$ 928.7	$ 947.3	$ 966.3
TOTAL NON-GAMING	$ 96.2	$ 108.2	$ 110.2	$ 112.7	$ 115.2
TOTAL GROSS REVENUE	**$ 923.3**	**$ 1,022.9**	**$ 1,038.9**	**$ 1,060.0**	**$ 1,081.5**
(-) Promo and Marketing Comps	$ 82.4	$ 86.5	$ 83.7	$ 85.3	$ 87.1
NET REVENUE	**$ 840.9**	**$ 936.5**	**$ 955.3**	**$ 974.7**	**$ 994.4**
Source: APC					

ALTERNATIVES A AND B: COMPETITIVE IMPACTS

The table below summarizes the competitive impacts on all primary, secondary and tertiary casino competitors in the region. The impact on the proposed Koi Nation Shiloh Resort & Casino is also forecasted.

Competitive Impacts Summary (2029 with Project vs 2029 Base)			
Property	**City**	**% Impact**	**Years to Recover***
Primary Competition			
Cache Creek Casino Resort	Brooks	(15.5%)	5.6
San Pablo Lytton Casino	San Pablo	(21.1%)	7.9
Graton Resort & Casino**	Rohnert Park	(12.1%)	4.3
Secondary Competition			
Hard Rock Sacramento	Wheatland	(7.9%)	2.7
Thunder Valley Casino Resort	Lincoln	(5.9%)	2.0
Red Hawk Resort Casino	Placerville	(6.9%)	2.3
Jackson Rancheria Casino Resort	Jackson	(8.8%)	3.0
Harrah's Northern Cal	Ione	(8.9%)	3.1
Sky River Casino	Elk Grove	(6.2%)	2.1
River Rock Casino**	Geyserville	(11.6%)	4.1
Twin Pines Casino & Hotel	Middletown	(12.5%)	4.4
Tertiary Competition			
Colusa Casino Resort	Colusa	(9.3%)	3.2
Feather Falls Casino & Lodge	Oroville	(5.7%)	2.0
Gold Country Casino Resort	Oroville	(5.7%)	1.9
Konocti Vista Casino Resort	Lakeport	(9.4%)	3.3
Robinson Rancheria Resort & Casino	Nice	(9.1%)	3.2
Running Creek Casino	Upper Lake	(8.9%)	3.1
Coyote Valley Casino Resort	Redwood Valley	(9.3%)	3.2
Sherwood Valley Casino	Willits	(9.3%)	3.2
Future Competition			
Koi Nation Shiloh Resort**	Windsor	(9.9%)	3.4

Source: APC

**Calculated assuming continued annual growth at 3.1%*

***Impacts calculated after all planned expansion/opening*

ALTERNATIVE C: FORECAST OF HOTEL AND COMMERCIAL REVENUES

The tables below summarize the hotel revenue and commercial rental revenues for Alternative C.

Stable Year (Year 2) Hotel Revenue Forecast			
	Hotel 1	Hotel 2	Combined
Grade	Upper Upscale	Upscale	
# of Keys	132	132	264
(x) Days in a Year	365	365	
Available Room Nights	48,180	48,180	96,360
(x) Est. Occupancy %	74%	83%	78%
Occupied Room Nights	35,412	39,749	75161
(x) ADR ($)	285	220	251
Total Room Revenue ($m)	10.1	8.7	18.8
Café Revenue ($m)	1.1	0.8	1.9
Meeting & Event Revenue ($m)	0.3	0.2	0.4
Total Hotel Revenue ($m)	**11.5**	**9.7**	**21.2**
Source: APC			

Stable Year (Year 2) Commercial Space Revenue Forecast			
	Commercial 1	Commercial 2	Combined
Grade	Large	Boutique	
Square Footage	120,474	9,228	129,702
(x) Sales/Sq. Ft ($)	450	1,000	489
Total Commercial Revenue ($m)	**54.2**	**9.2**	**63.4**
Source: APC			

ALTERNATIVE C: PRO FORMA REVENUE FORECAST

The table below summarizes the revenue forecast for first five years of operation for Alternative C.

Alternative C - Pro Forma Revenue Forecast	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
DEPARTMENTAL REVENUES					
Hotel	$ 19.1	$ 21.2	$ 21.6	$ 22.1	$ 22.5
Commercial Space	$ 53.9	$ 63.4	$ 65.3	$ 67.3	$ 69.3
TOTAL Revenue ($m)	**$ 73.0**	**$ 84.6**	**$ 87.0**	**$ 89.4**	**$ 91.8**
Source: APC					

ENGAGEMENT OVERVIEW

Acorn Environmental is assisting the Scotts Valley Band of Pomo Indians (“Tribe”) in its Land in Trust process with the goal of developing a casino (“Project”) on the Tribe’s ancestral lands. The Company and the Tribe have identified a suitable parcel of land for development of a casino, related non-gaming amenities, and Tribal community functions, approximately 34 miles northeast of San Francisco. The 128-acre site is just off Interstate 80 and Columbus Parkway, within the city of Vallejo.

Advantage Partners Consulting (“APC” or “Consulting Team”) was engaged to perform a series of studies to integrate into the Project’s Economic Assessment (“EA”). These include a Market Study that will forecast gaming revenue and net income that the Project will generate, an Economic Impact Study that will measure the impact of the Project in terms of labor, labor income, and total output, a Competitive Impacts Analysis that will measure the impacts that the Project will have on other Tribal casinos in the region, and a Social and Community Impact Study.

For each of the aforementioned analyses, APC was asked to prepare its analysis under three unique development scenarios:

Alternative A – Proposed

Alternative A is the proposed project. It consists of the core development which will include a casino, restaurants, events/multi-purpose space, and associated parking and infrastructure. The casino and associated facilities will occupy the central portion of the Project site, and will be housed in a five-story structure that includes three levels of below-ground parking and two levels above ground that will house the casino and related amenities.

In addition to the casino complex, a Tribal housing and community development will occupy a northern portion of the Project site, comprised of 24 single-family residences, necessary infrastructure, and an adjacent Tribal administration building.

Alternative B – Reduced Intensity Alternative

Alternative B is the Reduced Intensity Alternative. It consists of the core development, which will include a casino, restaurants, events/multi-purpose space, and associated parking and infrastructure. The casino and associated facilities will occupy the central portion of the Project site, and will be housed in a five-story structure that includes three levels of below-ground parking and two levels above ground that will house the casino and related amenities. It does not include Tribal housing or Tribal administration building.

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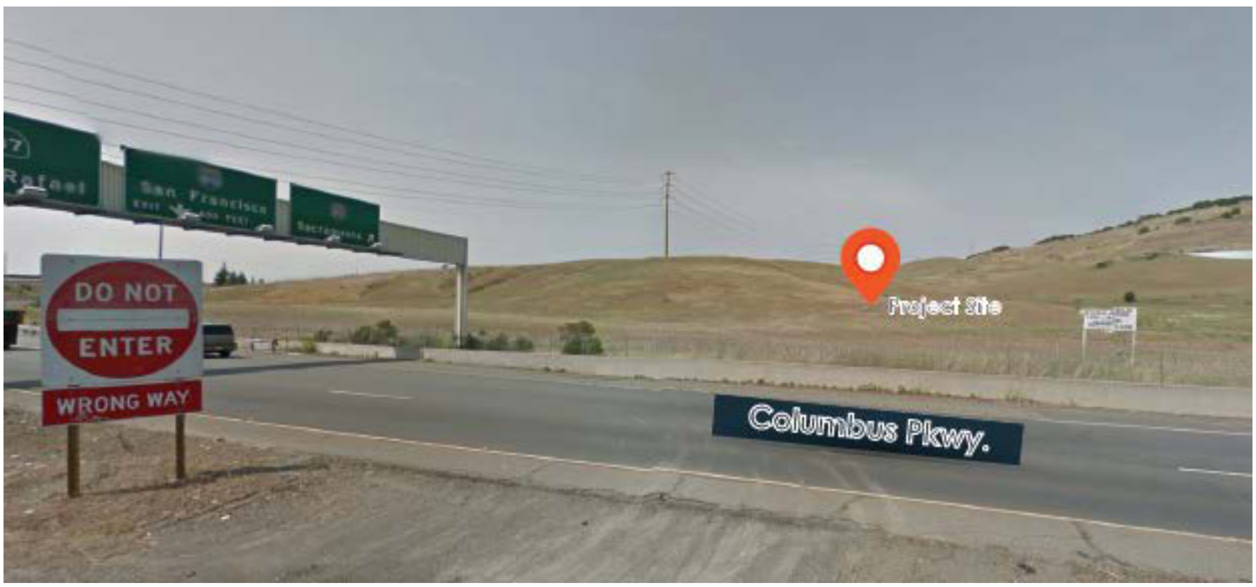
Advantage Partners Consulting

PROJECT AND SITE DESCRIPTION

SITE DESCRIPTION

LOCATION

The Project site is located on a 128-acre land parcel at the intersection of Interstate 80 ("I-80") and Columbus Parkway in the city of Vallejo. At that point, I-80 is oriented in a north/south configuration. The site is located just east of the eastbound lanes of I-80. Columbus Parkway currently serves as a primary transportation corridor servicing a major shopping center, auto mall, and upscale residential communities to the south and east of I-80. While the Project site is undeveloped today, much of the surrounding area around the I-80 interchange is fully developed.



ACCESS

Vehicular access to the site is excellent. I-80 is the region's primary east-west highway and connects to the San Francisco Bay Bridge, approximately 30 miles to the west. I-80 runs through Sacramento, 57 miles to the east, where it connects with I-5 and US-50. I-80 also intersects with I-580, offering connectivity to the city of Oakland and communities along the South Bay. I-780, a primary highway serving the East Bay, intersects I-80 approximately four miles to the west of the Project site while I-680 intersects I-80 eight miles to the east. In addition to easy access to and from I-80, State Route 37 (Columbus Parkway) provides access to US-101, and Marin and Sonoma counties.

SURROUNDING NEIGHBORHOOD

The area around the Project site is fully developed with a number of retail centers as well as a variety of entertainment venues. Gateway Plaza, a big box retail center, is located on the opposite side of Columbus Parkway. That shopping center along with others feature a Best Buy, Home Depot, Target, and COSTCO along with a number of other nationally branded retailers. Adjacent to the mall is a regional auto mall.

Residential communities can be found to south and east of the Project site along Columbus Parkway, and west of I-80.

Two major entertainment venues are on the opposite side of I-80. These include a Six Flags Theme Park and the Solano County Fairgrounds. The Fairgrounds is currently under redevelopment and upon completion will be rebranded as Solano 360. It will feature an exposition center along with a traditional fairgrounds.

Project Site and Surrounding Community

PROJECT COMPONENTS: ALTERNATIVE A AND ALTERNATIVE B

The Project is expected to have sufficient capacity to meet the needs of the local and regional gaming market. The sizing of the casino property is identical under both the (A) Proposed Project and (B) Reduced Intensity Project. The tables below summarize the major components and capacities of the Project.

CASINO

After comparison with the major properties currently in the regional market and tentatively calculating the win per unit per day (WPUPD) with different assumptions for the number of electronic gaming devices (EGDs) and the numbers of tables, APC assumes 3,500 electronic gaming devices (EGDs) and 130 table games for both Alternative A and Alternative B. It is important to note an appropriate mix of Asian-centric tables games including Baccarat and its variations and Pai-Gow to cater to preferences of the regional demographics was factored in.

Casino and Non-Gaming Components Alternatives A and B	
Gaming	**Units**
EGDs - Total	**3,500**
Table Games - Total	**130**
Restaurants and Bars	**Seats**
Total Dining Seats	**1,219**
Total Bar Seats	**450**
Banquet and Meeting Space	**Sq. Ft**
Ballroom and Prefunction	80,500
Source: APC	

RESTAURANTS AND BARS

Given the racial and ethnic mix of the Bay Area, food & beverage offerings are tailored to better match the market. As evident in the demographic summary detailed within this report, various Asian populations are represented throughout the Bay Area. As such, the mix of dining will skew toward various Asian nationalities. Bars and lounges will also play an important role in the gaming entertainment experience.

MEETING & EVENT SPACE

The city of Vallejo lacks a sufficient amount of meeting space. Normally, meeting space is built in conjunction with lodging; however, given demand for meeting space, coupled with the need for an entertainment venue, APC included flexible meeting space in its recommendations.

TRIBAL HOUSING AND ADMINISTRATION

Alternative A – Proposed Project also includes:

- 24 single-family residences
- Tribal administration building
- All necessary and related infrastructure.

PROJECT COMPONENTS: ALTERNATIVE C

Alternative C is a non-gaming alternative. It consists of the following components.

- Two four-story structures each with 132 lodging units
    - Café
    - Business Center
    - Swimming pool
- Two commercial buildings

TRIBAL HOUSING

- 50 townhomes
- Three Tribal administration buildings

ECONOMIC AND DEMOGRAPHIC OVERVIEW

This chapter provides a demographic and economic overview of the regional market area. To understand the relative economic strength of the region and health of the consumer demand segments, APC focused on trends in population, income, and employment. For the purposes of this analysis, APC examined the multiple counties surrounding the host county of Solano, which encompasses the primary trade and catchment area that the Project would serve. Data at the county level were derived from reliable sources including Claritas, the U.S. Bureau of Labor Statistics, and other publicly available sources.

ECONOMY

The Project Site is located in Vallejo, CA, which is an incorporated city inside of Solano County. Solano County is conveniently situated between the greater San Francisco Bay Area and Sacramento markets. Accessible from the major transportation corridor of I-80, Solano County boasts one of the largest manufacturing bases in northern California, totaling $5.8 billion in gross regional product including advanced materials, biotech, and food & beverage. There are approximately 1.3 million workers within a 40 mile radius of the county. The following table summarizes the major employers in Solano County.

Employer Name	Location	Industry	Employment
Flatiron Construction Corp	Benicia	General Contractors	3,500
Solano County	Fairfield	Government	3,200
Valero Benicia Refinery	Benicia	Manufacturing	1,200
Kaiser Permanente Vallejo Med	Vallejo	Hospitals	1,200
NorthBay Medical Ctr	Fairfield	Hospitals	1,115
Collins Aerospace	Fairfield	Manufacturing	1,100
Six Flags Discovery Kingdom	Vallejo	Amusement & Theme Parks	1,000
Kaiser Permanente Vacaville MD	Vacaville	Hospitals	900
Duravent Inc	Vacaville	Equipment Wholesale	800
Jelly Belly Candy Co	Fairfield	Manufacturing	700
Sutter Solano Medical Ctr	Vallejo	Hospitals	690
NorthBay Healthcare Green Vly	Fairfield	Health Services	600
Northbay Vacavalley Hospital	Vacaville	Hospitals	501
Solano County Sheriff	Fairfield	Government	500
Touro University California	Vallejo	University/College	500
Guittard Chocolate Co	Fairfield	Manufacturing	400
Walmart Supercenter	Dixon	Department Stores	300
Walmart Supercenter	Suisun City	Department Stores	300
Vacaville City Hall	Vacaville	City Hall	300
Solano County Office of Education	Fairfield	Schools	250
USDA Forest Svc	Vallejo	Government	200
Vallejo City Manager's Office	Vallejo	Government	150
Source: CA State Government, CA Employment Development Division, Solano County			

Solano County offers a more affordable living option when compared to the western portions of the Bay Area. On average, housing costs are estimated to be 50 percent less than counties to the west. In addition to a diverse economy and relatively affordable housing, the mild climate, and proximity to the Sierra Nevada mountains to the east, wine country to the north, and San Francisco to the west have helped fuel the area's growth. These factors are important when evaluating the labor force needs of the Project as well as attracting top talent to relocate to the area.

LABOR FORCE AND EMPLOYMENT STATISTICS AND TREND

To understand the relative strength and stability of the regional economy, APC examined labor force and employment statistics for Solano County, Contra Costa County, the city of Vallejo, and the State of California as a whole. Based on commuting patterns and population sizes, Solano County and Contra Costa County are expected to contribute the bulk of employees needed to meet the Project's labor demands. Solano County has a labor force in excess of 200,000 workers along with Contra Costa County at over 550,000 workers. Both counties currently have low unemployment rates or are at normal unemployment levels. Nevertheless, both counties were not immune to the pandemic related shutdowns with unemployment spiking in 2020.

A more volatile labor market exists in Vallejo given a smaller labor force and less diverse economy when compared to broader county areas. Overall, Contra Costa County generates lower unemployment when compared to the state benchmark, while Solano County tracks closer to state averages.

Solano County Average Annual Statistics				
in 000s except %	Labor Force	Employed	Unemployed	Rate
2013	202.3	183.8	18.6	9.2%
2014	202.4	187.0	15.4	7.6%
2015	204.9	192.2	12.6	6.2%
2016	207.3	195.8	11.4	5.5%
2017	207.9	198.0	10.0	4.8%
2018	209.1	200.8	8.3	3.9%
2019	208.5	200.6	7.9	3.8%
2020	202.2	182.5	19.7	9.8%
2021	200.7	185.8	14.9	7.4%
2022	202.3	193.8	8.5	4.2%
Source: US Bureau of Labor Statistics, CA Employment Development Division				

Contra Costa County Average Annual Statistics				
in 000s except %	Labor Force	Employed	Unemployed	Rate
2013	536.0	495.3	40.7	7.6%
2014	538.5	504.8	33.6	6.2%
2015	544.6	517.0	27.6	5.1%
2016	553.2	528.4	24.8	4.5%
2017	557.9	536.3	21.6	3.9%
2018	560.3	542.3	18.0	3.2%
2019	561.0	543.5	17.5	3.1%
2020	547.4	498.1	49.3	9.0%
2021	544.0	509.3	34.7	6.4%
2022	551.5	532.1	19.4	3.5%
Source: US Bureau of Labor Statistics, CA Employment Development Division				

Vallejo (City) Average Annual Statistics				
in 000s except %	Labor Force	Employed	Unemployed	Rate
2013	58.0	50.8	7.1	12.3%
2014	57.5	51.6	5.9	10.3%
2015	57.7	52.9	4.8	8.4%
2016	56.9	53.4	3.5	6.1%
2017	56.7	53.3	3.3	5.9%
2018	56.7	54.2	2.5	4.5%
2019	56.7	54.3	2.4	4.2%
2020	55.2	48.8	6.4	11.6%
2021	54.4	49.6	4.7	8.7%
2022	54.3	51.8	2.5	4.7%
Source: US Bureau of Labor Statistics, CA Employment Development Division				

California (State) Average Annual Statistics				
in 000s except %	Labor Force	Employed	Unemployed	Rate
2013	18,565	16,888	1,678	9.0%
2014	18,677	17,265	1,412	7.6%
2015	18,824	17,647	1,177	6.3%
2016	19,012	17,965	1,047	5.5%
2017	19,185	18,258	927	4.8%
2018	19,290	18,470	820	4.2%
2019	19,413	18,618	795	4.1%
2020	18,972	17,048	1,924	10.1%
2021	18,973	17,586	1,387	7.3%
2022	19,252	18,441	811	4.2%
Source: US Bureau of Labor Statistics, CA Employment Development Division				

POPULATION & INCOME

The Consulting Team prepared its gaming revenue forecast at the zip code level and aggregated up to the county level to present demographic data. As a result, the counties presented in the following tables account for over 90 percent of the Project's total gaming revenue. For each county, APC quantified the population over the age of 21, the number of households, and the average annual household income ("AAHI") in 2023 and 2029.

In 000's	Age 21+ Population			Households			
2023 ESTIMATE	**Asian**	**Non-Asian**	**Total**	**Asian**	**Non-Asian**	**Total**	**AAHI**
Alameda County	321.2	955.7	**1,276.9**	147.2	438.2	**585.4**	$167.7
Contra Costa County	145.4	728.2	**873.6**	69.1	398.1	**467.2**	$168.8
San Francisco County	219.9	474.6	**694.4**	113.9	247.0	**360.9**	$221.3
San Mateo County	169.3	415.2	**584.6**	75.8	189.7	**265.5**	$237.9
Santa Clara County	436.4	975.1	**1,411.9**	199.6	508.6	**708.2**	$233.4
Solano County	52.1	287.5	**339.5**	24.0	132.3	**156.3**	$121.8
Napa, Sonoma, Marin	52.1	287.5	**339.5**	24.0	132.3	**156.3**	$121.8
Sacramento, San Joaquin	266.3	1,476.0	**1,742.3**	79.1	694.2	**773.3**	$106.2
TOTAL/AVERAGE	**1,645.2**	**5,963.9**	**7,609.1**	**767.9**	**2,796.7**	**3,564.6**	**$166.2**
In 000's	Age 21+ Population			Households			
2029 FORECAST	**Asian**	**Non-Asian**	**Total**	**Asian**	**Non-Asian**	**Total**	**AAHI**
Alameda County	357.8	942.8	**1,300.6**	162.8	429.0	**591.8**	$178.6
Contra Costa County	175.7	739.5	**915.2**	79.8	335.7	**415.5**	$182.1
San Francisco County	222.3	464.9	**687.0**	117.0	246.1	**363.1**	$226.5
San Mateo County	184.8	394.1	**578.9**	83.2	177.4	**260.5**	$237.0
Santa Clara County	478.9	945.8	**1,424.7**	213.8	422.6	**636.4**	$228.4
Solano County	53.6	287.5	**341.1**	25.0	131.0	**156.0**	$128.1
Napa, Sonoma, Marin	38.7	658.3	**697.0**	18.7	314.4	**333.1**	$145.8
Sacramento, San Joaquin	288.0	1,532.3	**1,820.3**	83.1	852.1	**935.2**	$114.9
TOTAL/AVERAGE	**1,817.8**	**5,972.3**	**7,790.1**	**842.5**	**2,775.1**	**3,617.6**	**$177.8**
	Age 21+ Population			Households			
CAGR	**Asian**	**Non-Asian**	**Total**	**Asian**	**Non-Asian**	**Total**	**AAHI**
Alameda County	1.8%	(0.2%)	**0.3%**	1.7%	(0.4%)	**0.2%**	1.1%
Contra Costa County	3.1%	0.3%	**0.8%**	2.4%	(2.7%)	**(1.8%)**	1.3%
San Francisco County	0.2%	(0.4%)	**(0.2%)**	0.3%	(0.1%)	**0.1%**	0.4%
San Mateo County	1.5%	(0.9%)	**(0.2%)**	1.5%	(1.1%)	**(0.3%)**	0.0%
Santa Clara County	1.6%	(0.5%)	**0.2%**	1.5%	(0.7%)	**(0.2%)**	(0.4%)
Solano County	0.5%	0.0%	**0.1%**	0.7%	(0.2%)	**(0.0%)**	0.9%
Napa, Sonoma, Marin	(4.9%)	2.0%	**1.6%**	(3.8%)	16.3%	**11.1%**	3.1%
Sacramento, San Joaquin	1.3%	0.6%	**0.7%**	0.8%	3.4%	**3.2%**	1.3%
TOTAL/AVERAGE	**1.7%**	**0.0%**	**0.4%**	**1.6%**	**(0.1%)**	**0.3%**	**1.1%**

Source: APC, 2020 US Census

EXAMINATION OF THE REGIONAL CASINO COMPETITION

Casino gaming in various forms has been available in California for well over three decades. In fact, the tribes of California were the ones that initially challenged the laws that prohibited the nation's Indian tribes from offering casino gaming. These challenges in turn led to a 1987 decision by the United States Supreme Court that allowed tribes to offer gaming. That decision in turn led to the passage of the Indian Gaming Regulatory Act of 1988. In 1999, the majority of California's tribes entered into Compacts with the Governor. In 2000, Proposition 1A further codified the rights of tribes to offer casino gaming and ushered in a period of unprecedented expansion of Indian gaming in the state.

REGIONAL MARKET MAP

PRIMARY COMPETITION

The Tribe and its development partners will be entering a very mature market in which the region's casino operators have long cultivated loyalty among the region's gaming customers. This section reviews those primary competitors that the Project will compete with.

Three primary competitors, Cache Creek Casino Resort, San Pablo Lytton Casino, and Graton Resort & Casino were identified. They are all located within a 60-mile radius and 1-hour drive time ring from the Project site, and each competes with the Project for players and traffic from north of the Project site, west of the Project site, and south of the Project site. These three competitors also rank among the highest in gaming revenue among all competitors included in this study, and Cache Creek Casino Resort and Graton Resort & Casino are also considered the leaders in Northern California in terms of scale and amenities offered along with Thunder Valley Casino Resort.

Understanding the strengths and weaknesses of these primary competitors was used not only in the Market Study but the Competitive Effects Study, presented later in this report that quantifies the impact that the Project will have on regional competitors.

CACHE CREEK CASINO RESORT

Cache Creek Casino Resort is owned and operated by the Yocha Dehe Wintun Nation, and is one of the most attractive and successful casinos in California. It features an expansive casino, two hotel towers with a total of 659 lodging keys, a wealth of dining options, and a championship golf course. Given the suite of amenities and established presence in the market, wrestling high-worth players from this competitor will be a challenge that location alone will not overcome.

The Rumsey Band of Wintun Indians has benefited from astute and stable management. The management team had long recognized the value of the Asian populations residing in the Bay Area, well before Asian-American gamers' value was recognized by the majority of Nevada's casino operators. Going back to the 1990's, one could find collateral material at the casino's player rewards center in Mandarin, Cantonese, Vietnamese and Tagalog. In particular, the casino developed relationships with many high-worth players of Chinese descent who reside in the Bay Area.

HISTORY

Cache Creek is one of the oldest casinos in California. It has evolved over the past four decades, starting as a bingo hall in 1985 and then adding gray market slot machines in the 1990s. After signing the Davis Compact in 1999, and the subsequent passage of Proposition 1A two years later, the Tribe was able to secure conventional financing. This in turn allowed the Tribe to replace its original casino building with its current facility in 2004 at a cost of $200 million.

Tribal leadership had long understood that in order to protect its share of the market, its casino had to be more than a room with slot machines and table games. As such, it developed a suite of non-gaming amenities that complemented the casino and enhanced the vacation experience. The Tribe built a championship golf course in a valley approximately one mile east of the casino. It also constructed a 200-key, four-star hotel.

Demand for lodging had long exceeded supply, and the vast majority of room nights were allocated to Casino Marketing, making it nearly impossible for a non-rated player to book a room. That led the Tribe to add a 459-key hotel tower, which it opened in 2020.

LOCATION AND ACCESS

Cache Creek is located in the Capay Valley, approximately 90 miles northeast of San Francisco and 48 miles northwest of Sacramento. Access to the casino from the Bay Area is via Interstate 80/Interstate 505. While the majority of the commute is on interstate highway, the final portion of the trip takes drivers on approximately 13 miles of rural roads that wind through small towns and the Capay Valley. While picturesque, the route can be difficult to navigate, particularly at night. Low speed limits also frustrate drivers. Likewise, the commute from Sacramento is equally difficult, again requiring customers to navigate two-lane roads.

Cache Creek is sixty miles from the Project site.

AMENITIES

Cache Creek features a long list of amenities that clearly differentiates the property from other Indian casinos. These include a championship golf course, 659 rooms and suites, a 1,300-seat events center, two outdoor pools, multiple dining options including two Chinese restaurants, a sushi restaurant, steakhouse, 3-meal room, and a number of grab-and-go facilities. While it has a buffet, operating hours and days have been reduced post-pandemic.

Cache Creek was also one of the first California casinos to establish high limit rooms for Asian games separate from high limit slots and western-style table games. Management's continued focus on premium Asian gaming remains the property's primary strength.

EXPANSION PLANS

With the most recent expansion completed in 2020, the Tribe has not announced any further expansions.

SAN PABLO LYTTON CASINO

The San Pablo Lytton Casino is a Class II gaming facility located in the city of San Pablo. It is owned and operated by the Lytton Band of Pomo Indians. It benefits from a location in a densely populated urban region near Berkley and Oakland.

HISTORY

As with many tribes in California, the Lytton Band's reservation was located in a less than ideal location. The city of San Pablo is an economically depressed community. The casino was originally developed on land that once housed a trailer park and bowling alley.

The Lytton Band of Pomo Indians regained federal recognition in the 1980s, and has about 275 enrolled members. The Tribe never entered into a Compact with the Governor. US Senator Diane Feinstein, who served in that capacity from 1992 until her death in 2023 was steadfastly opposed to a casino so close to San Francisco, which further precluded the Tribe from entering into a Compact, or placing adjacent land into trust.

Since the Indian Gaming Regulatory Act permits any federally recognized tribe the right to offer Class II gaming, the Tribe opened up a card room in 1994, featuring player banked table games, essentially various types of poker. By 2004, the Tribe added several hundred Class II electronic gaming devices, whose game math was based on bingo. The quality of those machines continued to improve where today, their gaming entertainment quality is nearly identical to Class III machines. As important, by not signing a Compact, the Tribe is under no obligation to share revenues with the state. It does, however, contribute a portion of its revenues to the city of San Pablo, which has grown dependent on those revenue streams. Today, the casino offers over 1,500 Class II gaming devices and enjoys some of the highest win per unit per day revenues in California.

While the casino is confined to a very small land parcel, precluding any major expansion, the Tribe was able to purchase an adjacent medical center in 2017. That facility was subsequently demolished and 1,000 surface parking spaces were added.

LOCATION AND ACCESS

The San Pablo Lytton Casino is located approximately five blocks from an I-80 interchange. Access from the highway is very good. The casino is approximately 18 miles northeast of San Francisco and nine miles from Berkley. The casino is also served by public transit. It enjoys a location within a densely populated area with no nearby competition.

The San Pablo Casino is nineteen miles southwest of the Project site.

AMENITIES

The casino has very few amenities. It offers a steakhouse and grab-and-go facility. Over the years, every available piece of public space was allocated to Class II machines. This business strategy eventually caused the closure of the casino's original poker room.

EXPANSION PLANS

The Tribe does not have plans to expand the property nor enter into a Compact with the Governor.

GRATON RESORT & CASINO

Graton Resort & Casino is owned and operated by the Federated Indians of Graton Rancheria. It is located near Rohnert Park in Sonoma County.

HISTORY

Development of the Graton Resort & Casino took well over a decade. Planning began in 2003. The Tribe partnered with Red Rock Resorts, which served as the Tribe's management company for the first seven years of operation. The property was modeled after the Company's Red Rock Casino Resort in Las Vegas. The Tribe now operates the casino on its own, having retained most of the management team that Red Rock Resorts originally brought in.

The casino opened on November 5, 2013 at a total cost of $850 million. Just over a year later, the Tribe secured a second $450 million loan to build their six-story, 200-room hotel, which opened in November 2016.

LOCATION AND ACCESS

The Graton Resort & Casino is located just south of Rohnert Park and west of US-101. The property is approximately 50 miles north of San Francisco. Graton's location makes it the most convenient full-service casino resort to residents of Marin County and San Francisco.

The Graton Resort & Casino is approximately 40 miles northwest of the Project site. Average traffic time between Graton and the Project site is approximately one hour.

AMENITIES

The casino-resort features all of the elements of a locals-oriented property. In addition to a 200-room hotel and casino, the property features over 3,000 Class III gaming devices, approximately 100 table games, and an attractive mix of casual and fine dining. The hotel also has ample meeting space and an events center.

EXPANSION PLANS

In June 2023, the Tribe broke ground on its $1 billion expansion that will include 221 additional hotel keys, 2,000 more electronic gaming devices, 20 more table games, a 3,500-seat entertainment venue, and a five-story parking structure.

SECONDARY COMPETITION

Eight secondary competitors were identified including the Hard Rock Hotel and Casino Sacramento, Thunder Valley Casino Resort, Red Hawk Resort Casino, Jackson Rancheria Casino Resort, Harrah's Northern California, Sky River Casino, River Rock Casino, and Twin Pines Casino & Hotel. They are all located outside a 60-mile distance radius and 1-hour drive time ring from the Project site, but within an 85-mile distance radius and 80-minute drive time ring from the Project site.

Six of the competitors are located east of the Project site in the Greater Sacramento area, competing with the Project for players and traffic east of the Project site in Solano County, Yolo County, Sacramento County, and San Joaquin County. Two of the competitors are located further northwest of the Project site than Graton Resort & Casino. They do not directly compete with the Project, but they compete with two of the Project's primary competitors in Graton Resort & Casino and Cache Creek Casino Resort and tertiary competitors further northwest for players and traffic from Sonoma County, Napa County, and Yolo County.

SKY RIVER CASINO

The Sky River Casino is owned by the Wilton Rancheria and managed by Boyd Gaming, the Tribe's development partner. It is located in the city of Elk Grove and opened in August of 2022.

HISTORY

The history of the Wilton Rancheria and the casino are intertwined, and deserve to be mentioned. The Tribe has historic roots to the area around the Cosumnes River near the casino site. The Tribe's status was terminated in 1958 under the California Rancheria Act, at a time when the federal government believed assimilation of Native American tribes was the appropriate social policy. It had devastating effects on the Tribe, plunging its members into poverty and unemployment.

By the 1990's the Tribe re-organized their government and requested federal recognition. In 2009, the Tribe had its federal recognition restored. A 36-acre portion of land was taken into trust for development of a casino. Through negotiations with the city of Elk Grove, a more suitable site was chosen, leading to the development of the casino at a former shopping mall.

LOCATION AND ACCESS

Sky River Casino is located just west of CA-99 and north of the Kammerer Road interchange, approximately 20 miles south of downtown Sacramento. It is a very convenient option for residents living on the south side of the city. More important, the property is located approximately 100 miles from the city of Fremont, the heart of the East Bay, and 110 miles from San Mateo in the South Bay, two cities with large concentrations of wealthy Asian Americans.

Sky River is 73 miles east of the Project site.

AMENITIES

Sky River Casino features a 110,000 square foot gaming floor with 2,000 slot machines, 80 table games, a poker room and multiple high-limit gaming areas. It offers four dining venues including an upscale steakhouse, brew pub, Chinese restaurant and a multi-station food hall. Overall, the property offers all of the essential elements of a modern casino property. It has a high limit Asian gaming room, quality dining options, and well-designed gaming floor.

EXPANSION PLANS

The Tribe and Boyd Gaming intend to add a hotel with 302 guest rooms, a spa, fitness center, pool, and an entertainment venue. A timeline has not been announced. The land parcel is of sufficient size to accommodate any future expansion.

THUNDER VALLEY CASINO RESORT

Thunder Valley Casino Resort is located near the city of Lincoln in the northeast suburbs of Sacramento. It is owned and operated by the United Auburn Indian Community.

HISTORY

The United Auburn Indian Community is a Native American tribe consisting mostly of Miwuk and Maidu Indians that were indigenous to the Sacramento Valley. Like other tribes, they lost their federal recognition in 1958, and subsequently had it restored in 1994. The Tribe then set about finding suitable land for development of a casino. What they wound up with was a parcel of land located near the county's sanitary landfill. While it was at first viewed as an unattractive site, it proved to be near ideal. There was little community opposition, given its proximity to the county dump. Nevertheless, residential growth in the area around the casino accelerated in the early 2000's giving the Tribe excellent access to a local residential market living within ten miles of the property.

The Tribe signed a Compact with Governor in 1999 and renegotiated the agreement in 2004. The casino opened in June of 2003 and underwent the first of several expansions in 2010. The Tribe also partnered with Station Casinos (now Red Rock Resorts) to serve as their development partner and casino operator. Station Casinos shepherded development of the casino and modeled it after their Green Valley Ranch Casino in Henderson, NV. Many architectural elements are nearly identical to the Nevada property.

LOCATION AND ACCESS

Thunder Valley Casino Resort is located off of CA-65, roughly equidistant from the cities of Lincoln and Rocklin. The property is easily accessible from CA-70 and I-80. It is 30 minutes from downtown Sacramento. Given its location in the booming northeast quadrant of Sacramento, the property is the dominant casino property in the Sacramento region.

Thunder Valley is 82 miles east of the Project site.

AMENITIES

Thunder Valley is an excellent example of a property that evolved from an attractive locals casino, modeled after Green Valley Ranch, into a regional gaming and entertainment destination. Over the course of the past two decades, the property saw the addition of a 408-key hotel with 46 suites, a spa, 14 restaurants and a 900-seat ballroom and an amphitheater. It also acquired the Whitney Oaks Golf Club, an 18-hole championship golf course in nearby Rocklin.

RECENT EXPANSION

In February of 2023, the Venue at Thunder Valley opened. It is a $100 million indoor entertainment venue, capable of seating 4,500 patrons within a massive 150,000 square foot theater. Given its size, the casino is capable of bringing in true A-list acts such as The Eagles and Bruno Mars in a fairly intimate setting at prices that the market can afford.

The casino also recently opened a 111-key addition to their hotel.

HARD ROCK HOTEL & CASINO SACRAMENTO AT FIRE MOUNTAIN

The Hard Rock Hotel & Casino at Fire Mountain is located in the town of Wheatland in Yuba County, north of Sacramento. It opened in October of 2019. It is owned by the Enterprise Rancheria and managed by the Seminole Tribe of Florida. The Seminole Tribe owns the Hard Rock brand and has developed a chain of casinos bearing that name.

HISTORY

The Estom Yumeka Maidu Tribe of the Enterprise Rancheria has been a federally recognized tribe since 1915. Unlike other Native American Rancherias that lost their federal recognition in 1958, the Tribe retained theirs. Their history though was no less painful. The Rancheria was originally located in the hills northeast of Wheatland on what is now Lake Oroville. Tribal members were displaced by construction of the Oroville Dam, and settled in and around the city of Oroville.

The Enterprise Rancheria was able to negotiate with the state for a 40-acre site in Wheatland, adjacent to the Toyota Amphitheater, a regional outdoor entertainment venue. That occurred in 2002. In 2012 the land was placed into trust by the Bureau of Indian Affairs.

The Rancheria had a succession of development partners and the project was ultimately completed by the Seminole Tribe of Florida. The Tribe faced opposition from the United Auburn Indian Community, owners of Thunder Valley, and the Cachil Dehe Bane of Wintun Indians, owners of the Colusa Casino. Ultimately, the Tribe succeeded in overcoming opposition from other tribes and opened the property in 2019.

LOCATION AND ACCESS

The Hard Rock Hotel & Casino at Fire Mountain, now referred to as the Hard Rock Sacramento, is located on a 40-acre parcel within the 900-acre Yuba County Sports & Entertainment Zone. The project is located on Forty Mile Road, adjacent to the existing Toyota Amphitheatre between CA-70 and CA-65. The casino is five miles south of Marysville and 32 miles north of Sacramento. The surrounding area is sparsely populated.

Overall, highway access is good but the casino is hindered by a location that is less convenient than its primary Sacramento competitors. Thunder Valley, Red Hawk and Sky River all enjoy locations closer to residential populations.

The Hard Rock Casino is 88 miles northeast of the Project site.

AMENITIES

The property opened with a full suite of amenities including a 170-key, five-star hotel, a casino with 1,600 Class III gaming devices, 55 table games, a high-limit Asian gaming pit, a second high-limit table game room, a high limit slot room, a full suite of Hard Rock branded restaurants, and a 2,500-seat indoor entertainment venue.

EXPANSION PLANS

Hard Rock Live, the property’s entertainment venue, opened in 2021 along with a fueling station and convenience store on the perimeter of the property. No additional expansions have been announced.

RED HAWK RESORT & CASINO

Red Hawk Resort & Casino is owned and operated by the Shingle Springs of Miwok Indians. The property is located in Placerville within Eldorado County, just north of US-50, It is approximately 24 miles east of Sacramento.

HISTORY

Red Hawk Casino opened in December of 2008. Lakes Gaming assisted in the design and development of the casino, operating it under a management contract from its opening in 2008 until 2013, when its management services agreement was terminated.

The Tribe faced a number of challenges in the development of the resort. The site of the casino is in the foothills of the Sierra Nevada mountains, amidst varying terrain and elevations. Site preparation was an expensive and time-consuming endeavor. In addition, the Tribe was responsible for building a highway interchange at US-50. This was a very expensive project.

Although beautifully designed, the casino struggled to generate sufficient cash flow to cover debt service associated with development of the property. It was for this reason that the Tribe was unable to add a hotel until 2023.

LOCATION AND ACCESS

Red Hawk is located just north of US-50, a primary highway corridor connecting Sacramento to Lake Tahoe and Carson City. Downtown Sacramento is 24 miles to the west. The property's primary markets are the suburban residential corridors along US-50.

Access to the casino from US-50 is excellent. Patrons exiting US-50 can easily navigate to the casino's porte-cochere or parking garage.

Red Hawk is 92 miles east of the Project site.

AMENITIES

The property only recently evolved into a full-service resort. Prior to the opening of its hotel in 2023, the property did not have many non-gaming amenities to attract visitors. While it did offer an excellent mix of dining, the absence of a hotel severely limited the property's reach beyond the local day-trip gaming market.

The new hotel changed the positioning of the property. Its rooms are stylish and modern although built more to a 3.5 star grade than its primary competitors. The addition of The Apex (described below) further positioned the property as a family-oriented gaming resort. This is a clear point of differentiation from its competitors.

RECENT EXPANSION

In December of 2022, Red Hawk opened The Apex, an 85,000 square foot indoor amusement center on the top floor of the casino's garage. The Apex features an 18-lane bowling center, sports bar, a multi-level indoor go-cart track, golf simulation bays, and state-of -the-art virtual reality gaming suites. In addition, the property features a Kids Quest soft play activity center and a Cyber Quest arcade.

In May of 2023, Red hawk opened a five-story hotel with 156 lodging keys, including 25 suites.

JACKSON RANCHERIA CASINO RESORT

Jackson Rancheria Casino Resort is owned and operated by the Jackson Rancheria Band of Miwuk Indians. Jackson Rancheria is located approximately 50 miles southeast of Sacramento in the Sierra Nevada foothills at the base of the Eldorado National Forest.

HISTORY

The Jackson Rancheria Casino Hotel opened in 1991, making it the oldest property in the Sacramento/Stockton region. The property underwent a series of expansions, but it has not seen any significant improvements, aside from new machines and casino carpeting, in the last eight years.

LOCATION AND ACCESS

Jackson Rancheria is located off of CA-88 in the foothills of the Sierra Nevada Mountain range. It is not a particularly easy property to get to. US-88 is a two-lane road that runs south to Stockton, the casino's primary market. The fastest route for visitors from Sacramento is to travel southeast along CA-16 to CA-49 for 50 miles. Patrons of the property are greeted with excellent signage at CA-88.

The target markets at Jackson Rancheria are the Sacramento, Elk Grove, and Stockton markets, as well as tourists traveling to the area to visit national parks and other outdoor attractions. The property also attracts a considerable RV segment.

Jackson Rancheria is 105 miles east of the Project site.

AMENITIES

The property consists of a casino, hotel with an outdoor swimming pool, fitness center, arcade, entertainment and meeting space, several food & beverage outlets, an outdoor amphitheater, an RV park, and a convenience store.

Overall, the property is in good condition. The hotel was built in two phases with the latter phase featuring a more upscale design. The hotel has held up well given its age of approximately 20 years. Nevertheless, it is not competitive with the lodging at Red Hawk, Thunder Valley, and Hard Rock.

The hotel is separated from the casino by a service road. Hotel guests reach the casino via a skybridge that connects to the 4th floor of the parking garage.

EXPANSION PLANS

There are no known expansion plans currently underway.

HARRAH'S NORTHERN CALIFORNIA

Harrah's Northern California Casino is owned and operated by the Buena Vista Rancheria of Me-Wuk Indians in a management agreement with Caesars Entertainment Corporation. It opened in April 2019.

HISTORY

In 2018, the Tribe signed an operating agreement with Caesars Entertainment to manage the casino and license the Harrah's brand.

LOCATION AND ACCESS

Harrah's Northern California is located approximately 10 miles south of CA-88 in Ione, CA, at the base of the Sierra Nevada foothills, approximately 40 miles northeast of Stockton and 50 miles southeast of

Sacramento. It is located in a fairly remote location and visitors most probably have to drive past Jackson Rancheria or Sky River before arriving at the property.

Harrah's Northern California is 93 miles east of the Project site.

AMENITIES

The property is fairly austere. It is comprised of a casino and two food & beverage outlets.

The Marketplace food court offers three unbranded dining options of Mexican, Asian, and American. Louie Oliver's restaurant provides a casual, yet upscale option and serves as the casino's three-meal restaurant and bar.

EXPANSION PLANS

There are plans for a hotel but, given the recent opening of the Sky River Casino, the Tribe and its management company may not choose to invest in a lodging facility.

RIVER ROCK CASINO

The River Rock Casino is located in Geyserville, approximately four miles east of CA-101. It is owned and operated by the Dry Creek Rancheria Band of Pomo Indians and opened in 2002. The casino overlooks Alexander Valley and provides one of the most scenic views of any casino in the state. The casino is housed in a series of Sprung structures.

HISTORY

River Rock opened in 2002. In 2007, the Tribe announced plans to replace its Sprung structures with a permanent facility that would include a hotel, new casino, and a variety of other amenities. The announced budget was $300 million. While a massive garage was constructed to serve the new casino, the Tribe had difficulty securing funding for the rest of the project, and development stalled. The opening of the Graton Casino Resort in 2013, 32 miles to the south, negatively impacted property performance, further delaying financing and construction of a replacement facility.

LOCATION AND ACCESS

River Rock is located on a hillside overlooking Alexander Valley, one of California's premiere wine growing regions. It is approximately 25 miles north of Santa Rosa and 30 miles south of Ukiah.

The views from the casino are dramatic with broad vistas of vineyards and the coastal mountain range to the west. To reach the property though, patrons must egress US 101 and transit across four miles of two-lane roads that wind through vineyards, a small village and past multi-million-dollar residences. The local community had long been opposed to having a casino perched above the valley, with tour buses and cars driving across the valley at all hours. Regardless, after two decades, the casino and surrounding community have learned to live together.

River Rock is 68 miles east of the Project site.

AMENITIES

The casino features approximately 1,000 electronic gaming devices, 24 table games, a restaurant and bar branded as the Center Stage Bar & Grill, a three-meal restaurant and occasional buffet called Quail Run Café, and an Asian themed quick-serve dining outlet.

EXPANSION PLANS

The Tribe has recently taken initiatives to improve the property. In 2019, it engaged a consulting firm to conduct a feasibility study to replace the existing casino with a new building and add a hotel. In 2023, the Tribe reached an agreement with the Sonoma County Board of Supervisors and entered into a Memorandum of Understanding. The agreement outlined an expansion project that could feature a 100-key hotel, a 60,000-square-foot casino with up to 1,500 slot machines, about 440 more than in the existing casino, a wedding chapel and spa, and other amenities. The Tribe does not yet have a definite timeline, and it remains to be seen if the Tribe will be able to secure funding, given current and future competitive pressures. For the purposes of this report, APC assumed that this replacement property will be built and operational when the Project opens in 2028.

TWIN PINES CASINO & HOTEL

Twin Pines Casino Hotel is owned and operated by the Middletown Rancheria of Pomo Indians. It is south of the town of Middletown and primarily serves the local population. A modest hotel allows the casino to market into the Bay Area for a share of the overnight gaming population. Despite a location near a wealthy exurbian community, the casino is a very basic facility that offers a convenience-based gaming experience rather than an amenity-rich gaming and lodging destination.

LOCATION AND ACCESS

Twin Pines Casino is located on CA-29, just north of Napa Valley. CA-29 is a primary north-south road that crosses through Napa Valley. Access to the property from the highway is excellent.

Twin Pines is 60 miles north of the Project site.

HISTORY

Twin Pine opened in 1994 as a small slots-only casino housed in a steel building. In 2000, the casino moved into a larger Sprung structure, and in 2008 the casino was relocated into a new, purpose-built building. A hotel opened in 2009. Despite being value-engineered at an estimated cost per lodging key of $110,000, the hotel rooms offer a relatively attractive lodging experience. Overall, Twin Pine is an attractive 3-star casino-hotel that primarily targets residents living in Napa Valley.

AMENITIES

Twin Pine features a casino with 500 electronic gaming devices and 7 table games, a three-meal restaurant, bar & lounge, a quick-serve dining outlet, and gift shop. The property also features a hotel with 56 standard rooms and 3 suites, and a 10,000 square foot entertainment venue.

EXPANSION PLANS

No expansion plans have been made public.

TERTIARY COMPETITION

The region further north outside the Sacramento and Bay Area markets contains a number of smaller casinos that are considered tertiary competitors. Eight of these casinos are identified and they are all located outside a 90-mile distance radius and 85-minute drive time ring from the Project site. None of the properties listed below are expected to compete directly with the Project. Nevertheless, they affect player visitation patterns and the operations including marketing efforts of casinos in "primary competition" and "secondary competition." Because of this reason, they are also included in the gravity model series for gaming revenue forecast. These casinos include:

- Coyote Valley Casino Hotel, Redwood Valley, CA
- Sherwood Valley Casino, Willits, CA
- Konocti Vista Casino Resort, Lakeport, CA
- Robinson Rancheria Resort & Casino, Nice, CA
- Running Creek Casino, Upper Lake, CA
- Colusa Casino Resort, Colusa, CA
- Feather Falls Casino & Lodge, Oroville, CA
- Gold Country Casino Resort, Oroville, CA

FUTURE COMPETITION

SHILOH CASINO & RESORT

On September 15, 2021, the Koi Nation of Northern California submitted an application to the Bureau of Indian Affairs, requesting that the Secretary of the Interior take a 68.6-acre land parcel into trust for the benefit of the Tribe. In 2022, the Bureau of Indian Affairs initiated the preparation of an Environmental Assessment to analyze the potential environmental consequences of the Koi Nation of Northern California's proposed fee-to-trust transfer of this land parcel for gaming purposes in unincorporated Sonoma County, California, adjacent to the Town of Windsor. The proposed project includes a casino, hotel, conference/event center, restaurants, bars, and supporting parking and infrastructure. For the purposes of this report, APC assumed that this casino will be built and operational when the Project opens in 2028.

LOCATION AND ACCESS

The Shiloh Casino & Resort will be located east of US 101 and just south of the town of Windsor. The Shiloh Casino & Resort will be 16 miles north of the Graton Resort & Casino, and 32 miles south of the River Rock Casino in Geyserville.

Access and visibility from US 101 is expected to be very good, although Graton will remain the more convenient property to the residential populations living in Sonoma and Marin Counties to the south.

Shiloh Casino & Resort will be 55 miles northwest of the Project site. Given its location, it would be appropriately labelled as a primary competitor along with Graton Resort & Casino after a successful opening.

AMENITIES

Shiloh Casino & Resort will consist of a casino with 2,750 electronic gaming devices and 105 table games. Supporting amenities will include a 400 key hotel, 74,000 square feet of banquet and meeting space, a food court, five restaurants, and four bars. It will also feature a 2,800-seat events center, and parking for over 5,100 vehicles.

The table below summarizes key attributes for all casinos within the Project's primary, secondary, tertiary, and future competition. All these casinos are included in the gravity model series used to forecast revenue and competitive impacts.

Regional Competitive Summary

Property	City	EGD's*	Tables*	Hotel Keys*	F&B*
Cache Creek Casino Resort	Brooks	2,500	120	659	11
San Pablo Lytton Casino	San Pablo	1,500	-	-	1
Graton Resort & Casino**	Rohnert Park	3,500	120	200	12
TOTAL - PRIMARY		**7,500**	**240**	**859**	**24**
Hard Rock Sacramento	Wheatland	1,600	75	170	6
Thunder Valley Casino Resort	Lincoln	3,400	140	408	18
Red Hawk Resort Casino	Placerville	2,500	75	156	5
Jackson Rancheria Casino Resort	Jackson	1,500	32	86	6
Harrah's Northern Cal	Ione	700	12	-	3
Sky River Casino	Elk Grove	2,000	80	400	10
River Rock Casino**	Geyserville	1,000	24	-	3
Twin Pines Casino & Hotel	Middletown	500	7	59	3
TOTAL - SECONDARY		**13,200**	**445**	**1,279**	**54**
Colusa Casino Resort	Colusa	1200	9	62	4
Feather Falls Casino & Lodge	Oroville	850	12	84	4
Gold Country Casino Resort	Oroville	950	15	48	5
Konocti Vista Casino Resort	Lakeport	350	6	74	3
Robinson Rancheria Resort & Casino	Nice	350	8	48	3
Running Creek Casino	Upper Lake	270	6	-	2
Coyote Valley Casino Resort	Redwood Valley	400	10	101	3
Sherwood Valley Casino	Willits	220	-	-	1
TOTAL - TERTIARY		**4,590**	**66**	**417**	**25**
Koi Nation Shiloh Resort	Windsor	2,750	105	400	10
TOTAL - FUTURE		**2,750**	**105**	**400**	**10**
TOTAL - REGION		**28,040**	**856**	**2,955**	**113**

Source: APC, Property websites, American Casino Guide, CasinoCity.com, 500Nations.com

**EGD, table, hotel keys, food & beverage outlets/venues are approximate*

*** Graton Resort & Casino and River Rock Casino stats here are before expansion*

CASINO MARKET STUDY (ALTERNATIVES A AND B)

The first step in APC's analyses was to determine the revenues and expenses associated with the two casino development scenarios. To complete this task, APC conducted a Casino Market Study. Given that the only difference between Alternative A and Alternative B is the elimination of Tribal housing and Tribal administration, the difference between the gaming revenue impact was negligible.

METHODOLOGY

The Consulting Team employed the following methodologies to complete its analyses.

SITE VISIT

APC initiated this assignment by conducting a site visit to the greater San Francisco Bay Area. During the site visit, the Consulting Team examined the overall Project site, connectivity to the regional highway network, and proximity to local and regional population centers. The Consulting Team also visited nearby residential communities, paying particular attention to their ethnic and demographic composition. Particular attention was also paid to the surrounding commercial centers and entertainment venues.

The Consulting Team visited each of the primary and secondary casino competitors in the greater regional gaming market. While the Consulting Team had conducted similar site visits in years past, it was important to understand what improvements may have been made to individual properties as well as to determine if some properties had fallen into a state of disrepair. These observations affected each competitor's level of attraction, which in turn were factored into the forecasting models.

For each casino property, the Consulting Team examined vehicular access, distance from nearby population centers, quality of parking, and sense of arrival. Once inside the casino, the team examined the overall condition of the casino, slot machine and table game mix, high limit areas, and overall service levels. Particular attention was paid to the food & beverage offerings and other non-gaming amenities. These evaluations were then summarized, and served as a basis to determine each property's level of attraction, an important input for the forecasting model.

DEMOGRAPHIC AND ECONOMIC EVALUATION

APC quantified relevant regional economic trends for the entire trade area. These included employment trends, leisure and hospitality trends, and other relevant economic drivers. Using a demographic mapping program, APC quantified local and regional demographic trends including population growth, and changes in the age composition of the region's population. With insights gained from its analysis, APC estimated the local and regional population in the subject year of the forecast.

GRAVITY MODEL SERIES – GAMING REVENUES FORECAST

The Consulting Team employed a gravity model series to forecast the gaming revenue for the Project, gauged the total gaming market growth in the region, examined the sources of this market growth, and forecasted the competitive impacts to existing casinos in the regional market.

Gravity models are used in various social sciences to simulate, explain, and predict customer behaviors that mimic gravitational interaction as described in Isaac Newton's Law of Gravity. In the retail, gaming and hospitality industries, gravity models are used to identify site locations with higher traffic and correspondingly higher potential revenue. It is the core piece of analysis in many feasibility studies, market sizing efforts, and competitive impact forecasts in the gaming industry. A gravity model series generally factor in the following data:

- Demographic data by zip code/county level of the covered area.
- Demographic and income trends and projections from current year to subject year.
- Distance/drive time from each zip code/county to all the gaming destinations.
- The numbers of positions, hotel rooms, and F&B outlets of every existing and proposed property in the covered area.
- The current performance of existing properties.
- Player database information showing geographical sources of gaming revenue (where available).

The model was back tested and recalibrated to settle on the most accurate parameters to replicate the actual situation to the most granular level. Attractiveness values for the Project were calculated based on machine learning, and the model then outputs the forecasted gaming revenues under different scenarios.

This gravity model process also identified the key feeder markets for gaming revenue at the Project, the areas where gaming dollars are most subject to competitive effects, and the overall impact to the Greater Bay Area gaming market.

APC initially calibrated the gravity model to current market conditions in the “2023 Calibration” phase. APC then factored in demographic growth/decline and expected competitive changes in the market before the subject year (Year 2 of Project opening, targeted at 2029) to yield a “2029 Base Projections” scenario. The expected changes factored into for the “2029 Base Projections” include the following:

- Shiloh Resort & Casino owned by Koi Nation will open before 2029 near Windsor, CA with 2,750 EGD’s, 105 tables, 400 hotel rooms, and 10 food & beverage outlets.

- Graton Resort & Casino will complete their expansion which includes 2,000 additional EGD’s, 20 additional tables, 221 additional hotel rooms, a 3,500-seat entertainment venue and a parking garage before 2029.

- River Rock Casino will increase its slot count from 1,000 to 1,500 and table count from 24 to 28, and add a 100-room hotel tower.

Building from the “2029 Base Projections” scenario, APC layered in the casino programming for the Project to yield results for Alternative A – Proposed Project.

Given that Alterative B – Reduced Intensity Alternative, only removed 24 single family homes and an administrative building from the proposed development, APC deemed this too small a change to materially affect gaming revenue. As such, revenue forecasts are the same for Alternatives A and B.

ASIAN VS. NON-ASIAN ANALYSIS

Due to the concentration of Asian populations in the region, APC applied gaming factors independently to Asian and Non-Asian populations. It has been proven by decades of gaming operations/research across the globe that Asians demonstrate a higher propensity to gamble and contribute a higher percentage of income to gaming compared to other racial/ethnic groups. Analysis and studies examining databases of commercial gaming corporations and large tribal gaming enterprises have consistently confirmed that Asians make 10 percent to 30 percent more trips to casinos and spend 30 percent to 70 percent more of their disposable income on gambling activities. This is also why many major gaming operators have dedicated marketing departments and host programs specifically designed for Asian players. In fact, most large-scale/established operators have dedicated marketing teams for specific Asian ethnic groups such as Chinese, Korean, and Japanese customer segments.

MAJOR ASSUMPTIONS

The Consulting Team utilized the following major assumptions during the analysis/forecast:

- The Project will open in the beginning of 2028, as such calendar year 2028 was modeled as the first year of operations.
- **The first stabilized year of operation for the Project is expected to be 2029, whereby the market will have one full year (2028) to absorb it and allow for an appropriate ramp up period and marketing campaign penetration.**
- APC expects the Project to hire and retain executive and management teams of the highest caliber and quality.
- Given the competitive market that the Project will operate in, APC assumed that the Project would deploy a robust pre-opening marketing effort to recruit players and advertise the Project.
- The Project will employ aggressive marketing campaigns including free play offers and player appreciation events.
- The Project will roll out a well-designed, multi-tiered player rewards program.
- A robust marketing program designed to cater to the various Asian demand segments will be instituted and maintain excellent execution each year of operation.
- The Project will employ multi-lingual staff members such as dealers and hosts to adequately accommodate muti-ethnic demand segments.
- No other changes occur in the regional market area during the forecast period other than the changes previously detailed in this report.

MODEL CALIBRATION AND BASE PROJECTIONS

The Consulting Team calibrated the gravity model to simulate actual market conditions by utilizing the aforementioned methodology. The Consulting Team then factored in demographic growth/decline and expected competitive changes in the market in the subject year to yield a “2029 Base Projections” scenario. Building from the "2029 Base Projections" scenario, APC layered in the casino programming for the Project to yield results for the "Alternative A – Proposed Project" scenario.

MARKET GROWTH AND SIZING SUMMARY

In each stage of the forecasting model, the Consulting Team monitored the overall size and growth rates for the defined local market. The local market is defined as the aggregate of the following counties in the San Francisco Bay Area:

- Contra Costa County
- Alameda County
- Santa Clara County
- San Francisco County
- Solano County
- San Mateo County
- Marin County
- Napa County
- Sonoma County
- Sacramento County
- San Joaquin County

The Consulting Team also examines and forecasts the annual gaming revenue at each casino in the San Francisco Bay Area. The list of casinos examined and forecasted are the same as all the casinos previous identified under "Primary Competition," "Secondary Competition," "Tertiary Competition," and "Future Competition." All casinos under these four groups are also collectively referred to as "All Competition" in the tables.

The Consulting Team estimates that all existing casinos in "All Competition" generated a combined $2.7 billion from the local market in the 2023 Calibration phase. In the "2029 Base Projections" scenario, all casinos in "All Competition" are forecasted to generate $3.24 billion, a 19.9 percent increase over six years from 2023 to 2029 or a 3.1 percent average annual growth. This increase is primarily driven by the Graton Resort & Casino nearly doubling its gaming capacity, the Koi Nation Shiloh Resort & Casino opening and stabilizing, the completion of gaming space and hotel expansion of River Rock Casino, the Sky River Casino being fully ramped up by 2029, and inflationary increases from 2023 to 2029. APC arrived at this 3.1 percent average annual growth rate based on historical trends, current performances, regional demographic changes and employment forecast, and recent trends in the tribal gaming industry. The National Indian Gaming Commission (NIGC) recently released its fiscal year 2023 gross gaming revenue report showing a 2.4 percent year-over-year increase in national Indian gaming revenue from fiscal year 2022, and the average annual growth rate of national Indian gaming revenue was 3.3 percent from 2014 to 2019 before COVID-19.

The local market is expected to grow incrementally over the Base Projections model as the Project is layered in. As a result, APC projects the local market size to increase to $3.65 billion or a 12.8 percent increase in the Alternative A – Proposed Project scenario. The following table shows the progression of the market size growth in each stage of the gravity model.

Local Market Gaming Revenue Destination Summary						
	Project			Project + All Competition		
revenue in millions	Asian	Non-Asian	Total	Asian	Non-Asian	Total
Calibration	$ -	$ -	**$ -**	$ 798	$ 1,902	**$ 2,700**
Base Projection, 2029	$ -	$ -	**$ -**	$ 1,036	$ 2,201	**$ 3,237**
Alternatives A & B, 2029	$ 263	$ 509	**$ 772**	$ 1,177	$ 2,477	**$ 3,654**
Source: APC						

The table above also shows that the Project will generate $772 million in gaming revenue from the local market (defined earlier). A detailed breakdown of this $772 million by county will be provided in the next section, but it is worth noting that with the opening and stabilization of the Project, the total gaming revenue from the local market generated by the Project and all competition (20 other casinos) also increased $417 million. This means $417 million of the $772 million local market gaming revenue, or 54 percent of expected net gaming revenue achieved by the Project is organic growth, and only 46 percent of the Project net gaming revenue would be cannibalization. A more detailed examination of competitive impacts on the other 20 casinos under "All Competition" by the Project is available in a later chapter.

The growth of the market is within reason and expectation as the Project will be one of the largest casinos in the North Bay area, comparable to Cache Creek to the north and the expanded Graton Resort & Casino to the west. Currently, the market is underserved because almost all tribal casinos require driving for an hour or more from major residential areas and are very inconvenient for residents in the South Bay to reach because of the traffic around San Francisco as well as multiple bridges and other traffic choke points.

Despite this, San Pablo Lytton Casino, the non-Compacted Class II-only casino with extremely limited amenities and very poor playing environment, is still enjoying high win per unit per day (WPUPD) on inferior Class II slots because they have relatively the best location near Oakland and San Francisco. Cache Creek Casino, despite being one and a half hours away from San Francisco and Oakland and one hour away from Sacramento, still has a very energized panel of customers, occupying more than 60 percent of its gaming positions on weekday nights is also evidence that the market is underserved.

The Project site benefits from the following traffic/location related advantages among the competitive set:

- Situated right off I-80, which connects Sacramento and Oakland/San Francisco.
- Located near the most traveled exit in Vallejo with established major destinations nearby including a COSTCO, Target, Home Depot, other various big box retail stores, Six Flags amusement park, auto mall, and cinemas.
- Benefits from the trend of people moving to the outskirts of the Bay Area for space and affordability, especially Vallejo.

- Residents within a 90-minute radius of Vallejo and various areas along I-80 do not have to travel far to pay a visit to the Project.

The final step in the gravity model series was to open the Project to simulate its impact and gaming revenue draw in the market. APC performed this simulation, taking into account the Project programming and various non-gaming amenities planned as later outlined in this report.

GAMING REVENUE BY MARKET SEGMENT

The following table details the net gaming revenue projection by market segment. In Alternative A – Proposed Project scenario, the Project is projected to generate local net gaming of $772.5 million. Of this total, approximately 34 percent emanates from the Asian market segments. The local market accounts for over 92 percent of total net gaming revenue. The Project will garner seven to eight percent of total net gaming revenue from outside of the defined local market. Contra Costa County and Alameda County account for about 40 percent of total net gaming revenue due to population size and proximity to the Project.

Net Gaming Revenue Summary by Market Segment

	Project			Project + All Competition		
revenue in millions	Asian	Non-Asian	Total	Asian	Non-Asian	Total
Contra Costa County	$ 53.2	$ 132.2	$ 185.4	$ 131.5	$ 324.9	$ 456.4
Alameda County	$ 55.8	$ 98.1	$ 153.9	$ 220.9	$ 370.8	$ 591.7
Santa Clara County	$ 47.6	$ 56.8	$ 104.5	$ 280.9	$ 343.2	$ 624.1
San Francisco County	$ 41.6	$ 61.7	$ 103.3	$ 186.5	$ 277.4	$ 463.9
Solano County	$ 25.9	$ 69.5	$ 95.4	$ 38.1	$ 119.0	$ 157.1
San Mateo County	$ 26.4	$ 35.9	$ 62.3	$ 123.4	$ 177.0	$ 300.4
Marin, Napa, Sonoma	$ 7.0	$ 38.2	$ 45.2	$ 34.4	$ 363.1	$ 397.5
Sacramento, San Joaquin	$ 5.6	$ 16.9	$ 22.5	$ 160.8	$ 501.6	$ 662.4
Total Local Market	**$ 263.0**	**$ 509.4**	**$ 772.5**	**$ 1,176.5**	**$ 2,477.0**	**$ 3,653.5**
Outer Market			$ 62.3			
TOTAL			**$ 834.8**			

Source: APC

GAMING PERFORMANCE AND VISITATION FORECAST

With the net gaming revenue forecast complete, the Consulting Team prepared projections over a five-year time horizon. APC allowed for an appropriate ramp up from Year 1 to Year 2 and moderate year-over-year growth thereafter. Given the anticipated demand, APC envisions significant table games demand to meet the preferences of the local market demographics. As such, roughly 28 percent to 30 percent of gaming revenue is estimated to stem from table games.

Based on publicly reported admissions at comparable casino properties and proprietary data, the Consulting Team estimated annual visitation that the Project could attract. In Year 2, 5.5 million visits are projected.

Five-Year Gaming Performance and Visitation Summary					
revenue/visits in millions	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
Total Net Gaming Revenue	**$ 751**	**$ 835**	**$ 852**	**$ 869**	**$ 886**
Net Slot Revenue	$ 533	$ 593	$ 605	$ 617	$ 629
Slot Units	3,500	3,500	3,500	3,500	3,500
Win Per Slot Per Day	**$ 418**	**$ 464**	**$ 473**	**$ 483**	**$ 492**
Net Table Revenue	$ 218	$ 242	$ 247	$ 252	$ 257
Table Units	130	130	130	130	130
Win Per Table Per Day	**$ 4,592**	**$ 5,102**	**$ 5,204**	**$ 5,308**	**$ 5,414**
Source: APC					

NON-GAMING AMENITY ANALYSIS

The Project's non-gaming amenity offering is paramount in constructing a property that will enhance the guest experience, serve the community, and ultimately drive revenue for all stakeholders. As such, a robust food & beverage program is proposed to serve the core casino patrons as well as attract casual gamers and non-gamers to new restaurants. Additionally, the Consulting Team prepared a forecast for meeting and event space as the area is currently underserved. The meeting and event space will feature concerts and host large scale banquets and meetings to further drive visitation to the area.

FOOD & BEVERAGE

The Project's food & beverage amenities will serve as a critical component in the overall guest experience and financial operating performance. As such, it was paramount to develop an appropriate food & beverage program that would appeal to core gaming customers and the local population.

Blending insights from the Project leadership, regional preferences observed in the market, and the Consulting Team's knowledge of other regional markets, APC formulated programming recommendations detailing the size and style of each proposed venue. Through an iterative process to match property demand levels, APC prepared a detailed revenue forecast by food & beverage venue factoring in guest visitation from the gaming floor, and non-gaming customers by meal period.

VISITATION BY MEAL PERIOD

Drawing on the annual visitation forecast, the Consulting Team estimated the likelihood of guests dining by meal period ("MP"). This estimation was done for each meal period typical in a 24-hour cycle:

- MP1 – breakfast hours
- MP2 – lunch hours
- MP3 – dinner hours
- MP4 – late night hours

Given that the Project will not feature a hotel in its first phase, the distribution of average daily guests will be much lower during MP1 compared to MP2 and MP3. However, the Consulting Team factored in demand for breakfast hours to serve the needs of patrons that visit the property during those hours such as retirees and third shift workers.

With the distribution of guests complete, APC applied capture rates by meal period, signifying the propensity to dine. This analysis yields the number of guests dining by meal period. The Consulting Team estimates approximately 5,500 daily covers on average or a 36 percent capture rate of the average daily guest count for Year 2 of Project opening, targeted at 2029.

COVERS AND REVENUE BY MEAL PERIOD AND VENUE

An iterative cover analysis model was constructed utilizing the number of seats at each venue to meet the demand by meal period. To meet the forecasted demand, APC assigned average turns in each MP by venue. The Consulting Team made reasonable assumptions as to which venues would be open by meal period from an operational efficiency standpoint and to meet demand. The Consulting Team paid close attention to the number of turns by venue by spreading patronage across the facility in order to not strain any single venue.

To project revenue by meal period at each venue, APC assumed an average per cover check amount. These cover prices were adjusted by venue and meal period and inflated to 2029 dollars while taking into account price levels currently in the market. Additionally, an appropriate comp rate was applied at each venue ranging from 6 percent to 25 percent depending on the venue.

For Year 2 of Project opening, targeted at 2029, APC estimates the Project will serve approximately 2 million annual covers and generate $64.5 million in revenue before comps.

SUMMARY

To estimate casino floor beverage/center bar, and bar venues revenue, APC applied appropriate capture rates, and beverage per guest/spend per guest assumptions similar to levels achieved at comparable properties. The following table summarizes the projected food and beverage revenue in Year 2, or 2029.

Food & Beverage Revenue Summary

revenue in millions	Revenue	Comped Revenue	Percentage Comped
Restaurants/Bar Food	$ 64.6	$ 12.2	18.9%
Bars	$ 15.8	$ -	0.0%
TOTAL	**$ 80.4**	**$ 12.2**	**15.2%**

Source: APC

MEETING & EVENT SPACE

A robust meeting and event space program is proposed for the Project to round out its amenity mix, drive visitation/revenue, and feature a premiere venue in an underserved market. Given the hyper-competitive market and the concert circuit that is already in place among the region's casinos, APC assumed that the Project would offer a comparable entertainment experience and benefit from the existing tour circuit. Additionally, a large ballroom that is divisible into smaller spaces will be able to host and attract multiple simultaneous group events to large-scale events and banquets.

APC projected meeting and event space revenue by three different revenue segments: entertainment, beverage/retail, and banquets/meetings.

ENTERTAINMENT

APC assumed that the Project would feature an entertainment calendar similar to the other comparable properties in the market today to effectively compete and attract customers.

The Consulting Team factored in two distinct types of entertainment: "A" level acts, featuring national music acts, and "B" level acts that garner less attendance and command a lower ticket price. The Consulting Team projects the facility's events will garner 86 percent occupancy, yielding $9.1 million in ticket revenue in for Year 2 of Project opening or 2029.

BEVERAGE AND RETAIL

Additional revenue is expected to be generated from the sale of beverages and retail items on concert and event days. APC applied an average beverage spend and retail spend per ticket based on the projected ticket sales in each year to forecast revenue.

MEETING AND BANQUETS

APC also assumed the event space would be utilized as a venue for banquets and large-scale meetings driven by mid-week demand, such as corporate meetings/conventions, and weekend banquets, such as weddings. For Year 2 of Project opening or 2029, APC projects this source of revenue will generate $3.6 million in revenue.

In total, APC expects the proposed event space to generate $14.1 million in 2029, with a majority of revenue expected to stem from concerts/shows and banquet/meetings.

Meeting and Event Space Revenue Summary

	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
REVENUE					
Entertainment	$ 7,066,382	$ 9,132,000	$ 9,507,600	$ 9,895,154	$ 10,295,009
Retail	$ 411,000	$ 521,901	$ 548,061	$ 575,321	$ 603,723
Beverage	$ 616,500	$ 782,852	$ 822,091	$ 862,981	$ 905,584
Meetings	$ 2,966,600	$ 3,643,120	$ 3,792,256	$ 3,884,383	$ 3,978,842
TOTAL REVENUE	**$ 11,060,482**	**$ 14,079,873**	**$ 14,670,008**	**$ 15,217,840**	**$ 15,783,158**

Source: APC

PRO FORMA REVENUE FORECAST (ALTERNATIVES A AND B)

With the projections completed, APC prepared a consolidated revenue forecast for Alternative A and Alternative B. As a result, a five-year pro forma revenue forecast by category from gross gaming revenue down to the net revenue is presented.

GROSS GAMING REVENUES

Net Slots/EGDs and Table Games revenue were forecasted using APC's proprietary gravity model as detailed earlier in the report. The net gaming revenue forecast was grossed up to account for an attractive free play and table discounts offering. Poker Room revenue projections are the summation of estimated rake collection from regular cash game poker action and estimated numbers of tournaments held, expected numbers of entrants, and an appropriate house take percentage.

NON-GAMING REVENUES

Food & beverage revenues were forecast as detailed in the Non-Gaming Amenity Analysis chapter of this report. In total, food & beverage revenue is expected to be approximately 8.8 percent of total gross gaming revenue. Meeting and Event revenues were forecast as detailed in the Non-Gaming Amenity Analysis chapter of this report. Other revenues were based on research on comp sets. This is revenue primarily derived from gift shop sales, vending machine sales and ATM transaction fees.

PROMO AND MARKETING COMPS

Slot Free Play and Table Match Play & Discounts as a percentage of gross revenue were based on market research and proprietary data. Complimentary expenses were derived from comped food & beverage, promotional tickets, and retail merchandise giveaways.

Alternatives A & B - Pro Forma Revenue Forecast

	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
TOTAL GGR	$ 827.1	$ 914.7	$ 928.7	$ 947.3	$ 966.3
TOTAL NON-GAMING	$ 96.2	$ 108.2	$ 110.2	$ 112.7	$ 115.2
TOTAL GROSS REVENUE	**$ 923.3**	**$ 1,022.9**	**$ 1,038.9**	**$ 1,060.0**	**$ 1,081.5**
(-) Promo and Marketing Comps	$ 82.4	$ 86.5	$ 83.7	$ 85.3	$ 87.1
NET REVENUE	**$ 840.9**	**$ 936.5**	**$ 955.3**	**$ 974.7**	**$ 994.4**

Source: APC

COMPETITIVE IMPACTS ANALYSIS

The application of gravity model series was detailed in the earlier "Casino Market Study" chapter as the tool to simulate the current performance, incorporate planned expansions, and forecast future performance.

APC built a gravity model that includes all the 20 identified casinos, three under "Primary Competition", eight under "Secondary Competition", eight under "Tertiary Competition", and one under "Future Competition". Then the model was trained through machine learning with public and proprietary information and the Consulting Team's decades of industry experience and familiarity with the market to a level that it accurately replicates the current gaming revenue generation and distribution dynamics among all the 20 identified casinos. This is the "2023 Calibration" phase.

Then all demographic changes (including population growth, employment shift, income growth, and projected inflation), as well as planned expansion at all the 20 identified casinos were layered into the model to arrive at the "2029 Base" phase.

At last, the Project casino is layered onto the "2029 Base" for the model to forecast its gaming revenue as shown in the earlier "Casino Market Study" chapter, and also to forecast the competitive impacts on all the other 20 casinos, including the Koi Nation Shiloh Resort and Casino, which is not currently built but expected to be in operation by Year 2 of the Project, or 2029. It is only fair to use the "2029 Base" as the denominator or "prior" for this competitor impact study, because that would be the status quo if the Project never gets built. Because all the gaming revenue data are based on empirical knowledge and for the purpose of ensuring confidentiality, all impacts are shown in percentages.

In "2023 Calibration," the 19 casinos under "Primary Competition," "Secondary Competition," and "Tertiary Competition" are estimated to have a combined 30,500 gaming positions. In "2029 Base," the same 19 casinos and the Koi Nation Shiloh Resort & Casino are estimated to have over 36,600 gaming positions. The Project casino in Alternatives A and B is estimated to add another 4,400 more positions, a 12 percent increase.

It is expected that the three primary competitors in San Pablo Lytton Casino, Cache Creek Casino Resort, and Graton Resort & Casino would experience the sharpest negative impacts in GGR, 21.1 percent, 15.5 percent and 12.1 percent, respectively. The Project casino effectively sits at the heart of the triangle formed by these three primary competitors.

Competitive Impacts Summary (2029 with Project vs 2029 Base)			
Property	**City**	**% Impact**	**Years to Recover***
Primary Competition			
Cache Creek Casino Resort	Brooks	(15.5%)	5.6
San Pablo Lytton Casino	San Pablo	(21.1%)	7.9
Graton Resort & Casino**	Rohnert Park	(12.1%)	4.3
Secondary Competition			
Hard Rock Sacramento	Wheatland	(7.9%)	2.7
Thunder Valley Casino Resort	Lincoln	(5.9%)	2.0
Red Hawk Resort Casino	Placerville	(6.9%)	2.3
Jackson Rancheria Casino Resort	Jackson	(8.8%)	3.0
Harrah's Northern Cal	Ione	(8.9%)	3.1
Sky River Casino	Elk Grove	(6.2%)	2.1
River Rock Casino**	Geyserville	(11.6%)	4.1
Twin Pines Casino & Hotel	Middletown	(12.5%)	4.4
Tertiary Competition			
Colusa Casino Resort	Colusa	(9.3%)	3.2
Feather Falls Casino & Lodge	Oroville	(5.7%)	2.0
Gold Country Casino Resort	Oroville	(5.7%)	1.9
Konocti Vista Casino Resort	Lakeport	(9.4%)	3.3
Robinson Rancheria Resort & Casino	Nice	(9.1%)	3.2
Running Creek Casino	Upper Lake	(8.9%)	3.1
Coyote Valley Casino Resort	Redwood Valley	(9.3%)	3.2
Sherwood Valley Casino	Willits	(9.3%)	3.2
Future Competition			
Koi Nation Shiloh Resort**	Windsor	(9.9%)	3.4

Source: APC

**Calculated assuming continued annual growth at 3.1%*

***Impacts calculated after all planned expansion/opening*

For Cache Creek, the Project will partially intercept visitation from the Bay Area in the south and draw away more visitation from Sacramento. For San Pablo Lytton, the Project will further dwarf it in attractiveness, game offerings, and diverse and quality amenities. This strong appeal would significantly cut down visitation from Sonoma County, Napa County, Solano County, and Sacramento County. For visitors from Marin County, San Joaquin County, Contra Costa County, Alameda County and further south, the newer and more comprehensive Project could easily justify the slightly longer drive to visit the Project compared to visiting San Pablo Lytton. The negative impact on Graton Resort & Casino would not be as severe, because the expanded Graton would still be a highly attractiveness and powerful casino, effectively the second largest in California and the largest in Northern California. Moreover, the opening of nearby Koi Nation Shiloh Resort & Casino and an expanded River Rock Casino would form a very strong destination market in the center of Sonoma County with immense gravitational pull of visitation and gaming revenues from Marin County, Sonoma County, Napa County, and more counties further north along the Pacific coast and the U.S. Route 101 corridor. The impact to Graton because of the Project would mostly be lost revenue from Solano County, part of Napa County, and intercept traffic along U.S. Route 101.

For the six existing casinos east of the Project under “Secondary Competition” and the eight existing casinos north of the Project under “Tertiary Competition,” the Project will fulfill more demand in the local market and also stimulate more gambling behavior among various populations in the market. While the Project would draw some share of the visitation and gaming revenue westward from these eight casinos, the Project will also organically grow the total gaming revenue emanating from the local market, and because of this, the negative impacts are smaller.

To conclude this chapter, APC would like to put the competitive impacts into perspective with the two following statements:

1. As shown in the “Casino Market Study” chapter, a summary table shows that the Project will generate $772 million in gaming revenue from the local market, and with the opening and stabilization of the Project, the total gaming revenue from the local market generated by the Project and all competition (20 other casinos) also increased $417 million. This means $417 million of the $772 million local market gaming revenue, or 54 percent of expected net gaming revenue achieved by the Project is organic growth, and only 46 percent of the Project net gaming revenue would be cannibalization.

2. Also shown in the “Casino Market Study” chapter, the Consulting Team estimates that all existing casinos in “All Competition” generated a combined $2.7 billion from the local market in the 2023 Calibration phase. In the “2029 Base Projections” scenario, all casinos in “All Competition” are forecasted to generate $3.24 billion, a 19.9 percent increase over six years from 2023 to 2029 or a 3.1 percent average annual growth. Assuming this 3.1 percent annual growth in gaming revenue for this market would persist given a strong economy and an underserved market, it is comforting to know that the negative impacts due to the Project would wear off over a limited number of years to arrive back at the 2029 base level. The table below shows the estimated number of years for each casino to arrive back at the 2029 base level with the 3.1 percent annual growth only.

HOTEL AND COMMERCIAL SPACE STUDY (ALTERNATIVE C)

Alternative C consists of two hotels, two commercial buildings, Tribal housing, and Tribal administration buildings. Specifically, Alternative C includes two hotels, each with 132 lodging units, its own café, and limited meeting space. Tribal housing consists of 40 townhomes. Tribal administration will be housed in three buildings within the central portion of the Project Site. Alternative C does not include a casino or related amenities.

CURRENT LODGING SUPPLY

The area is currently served by a number of limited-service hotels including a Courtyard by Marriott, Hampton Inn, Quality Inn, and Red Roof Inn. There is a notable dearth of quality four-star and five-star lodging in the immediate market area as evidenced by the Smith Travel Research (STR) data below.

The following table shows that there are not any four-star or five-star quality hotels in Vallejo, Fairfield, Vacaville, and Benicia, the four largest cities in Solano County. In total, there are approximately 6,500 hotel keys in the market set with roughly half of the rooms located in Napa County, west of Solano County. There are about 2,100 hotel rooms in the Vallejo/Fairfield market, 30 percent of which are of three-star or Upscale quality.

Hotel Inventory by Location and Class

City	Luxury	Upper Upscale	Upscale	Upper Midscale	Midscale	Economy	Total	Drive Time
Vallejo			172	250	79	347	848	5-10 min
Fairfield			454	185	218	396	1,253	20-25 min
Vacaville			341	327	247	224	1,139	30-35 min
Benicia				145			145	15-20 min
Napa	1,634	835	325	185	60	58	3,097	30-45 min
Total Rooms	**1,634**	**835**	**1,292**	**1,092**	**604**	**1,025**	**6,482**	
Vallejo			20%	29%	9%	41%	100%	
Fairfield			36%	15%	17%	32%	100%	
Vacaville			30%	29%	22%	20%	100%	
Benicia				100%			100%	
Napa	53%	27%	10%	6%	2%	2%	100%	
% of Total	**25%**	**13%**	**20%**	**17%**	**9%**	**16%**	**100%**	

Source: Smith Travel Research/APC

HOTEL POSITIONING

With the above finding of the lack of any four-star or five-star quality hotels in the area, the Consulting Team proposes to the Company that in Alternative C, it would be optimal to build two hotels at the upper upscale level (four-star) or one hotel building at the upper upscale level (four-star) and one building at the upscale level (three-star). Given the site's connectivity to freeways and its proximity to malls and Six Flags amusement park nearby, the hotels would stand to benefit and outperform the existing hotels in the area.

More specifically, the proposed hotels would appeal to family travelers to the area, commercial transportation lodgers traveling along I-80 between Sacramento and San Francisco, and business travelers.

The planned commercial space could offer valuable addition and diversification to the myriad of shopping venues nearby. The ideas for the use of this commercial space are endless, including a sporting goods store, a cannabis store, a collection of high-end luxury goods stores, even a green-energy interactive museum.

The commercial space would bring in an additional lodger segment to complement family travelers, commercial transportation lodgers, and business travelers identified above.

The meeting and event space at the hotels could also attract small groups, sales meetings, and some events due to its location. The hotels would also generate some auxiliary revenue from the cafés and group sales.

REVENUE FORECAST

APC conducted research on the average daily rates (ADR) and occupancy of the existing lodging options within Solano County and the nearby Napa County to forecast the demand and pricing of the planned hotels. The Consulting Team also studied the types of retail businesses feasible for the proposed space and estimated reasonable sales per square foot. APC prepared the revenue forecast for a stable Year 2 (2029) as shown in the tables below.

Stable Year (Year 2) Hotel Revenue Forecast

	Hotel 1	Hotel 2	Combined
Grade	Upper Upscale	Upscale	
# of Keys	132	132	264
(x) Days in a Year	365	365	
Available Room Nights	48,180	48,180	96,360
(x) Est. Occupancy %	74%	83%	78%
Occupied Room Nights	35,412	39,749	75161
(x) ADR ($)	285	220	251
Total Room Revenue ($m)	10.1	8.7	18.8
Café Revenue ($m)	1.1	0.8	1.9
Meeting & Event Revenue ($m)	0.3	0.2	0.4
Total Hotel Revenue ($m)	**11.5**	**9.7**	**21.2**
Source: APC			

Stable Year (Year 2) Commercial Space Revenue Forecast			
	Commercial 1	Commercial 2	Combined
Grade	Large	Boutique	
Square Footage	120,474	9,228	129,702
(x) Sales/Sq. Ft ($)	450	1,000	489
Total Commercial Revenue ($m)	**54.2**	**9.2**	**63.4**
Source: APC			

HOTEL COMPETITIVE IMPACT

In order to assess the proposed hotels' competitive impacts on existing hotels in the area, APC collected and compiled the data shown in the table below. This table lists all the 26 hotels within a five-mile radius of the Project site, as well as the hotels room count, chain scale, associated brand, and opening date, where available.

List of Hotels within 5-mile Radius of Project Site					
Property Name	Distance (mile)	Room Count	Chain Scale	Open Date	Brand
Courtyard Vallejo / Napa Valley	2.9	172	Upscale	Aug-89	Marriott International
DoubleTree by Hilton Hotel & Spa Napa Valley	4.8	132	Upscale	Nov-06	Hilton Worldwide
Country Inn & Suites by Radisson Vallejo / Napa Valley	2.9	134	Upper Mid	Sep-86	Choice Hotels International, Inc.
Hampton Inn Vallejo	3.0	116	Upper Mid	Mar-90	Hilton Worldwide
Fairfield Inn & Suites Napa Valley	4.9	80	Upper Mid	May-04	Marriott International
Home2 Suites by Hilton Napa Valley	5.0	102	Upper Mid		Hilton Worldwide
Quality Inn Near Six Flags Napa Valley	3.2	79	Midscale	Sep-88	Choice Hotels International, Inc.
Super 8 Vallejo/Napa Valley	1.4	60	Economy	Apr-71	Wyndham Hotels & Resorts
Motel 6 Vallejo / Napa Valley	1.6	40	Economy	Jun-69	G6 Hospitality LLC
Studio 6 Vallejo / Napa Valley	1.7	36	Economy	Sep-22	G6 Hospitality LLC
SureStay by Best Western Vallejo / Napa Valley	2.1	49	Economy	Oct-89	BWH Hotels
Econo Lodge Vallejo	2.2	95	Economy	Sep-87	Choice Hotels International, Inc.
Motel 6 Vallejo Six Flags West	2.2	55	Economy	Jan-76	G6 Hospitality LLC
Vallejo Inn	0.4	29	Indep	Jan-87	
Rodeway Inn Vallejo	1.4	85	Indep	Jun-83	
California Motel	1.5	18	Indep	Jan-40	
Islander Motel	1.5	21	Indep		
Great Western Inn	1.5	25	Indep	Jan-35	
Bays Inn	1.6	20	Indep	Jan-36	
Budget Inn Vallejo / Napa	1.7	17	Indep		
El Rancho Motel	1.8	20	Indep	Oct-76	
Motel 7	1.8	78	Indep	Jun-74	
Economy Inn	1.8	10	Indep		
Discovery Inn	1.9	20	Indep		
Travel Inn	2.0	60	Indep	Sep-63	
Regency Inn	2.2	38	Indep		
Sub Totals					
Upscale		304			
Upper Midscale and Midscale		511			
Economy		335			
Independent		441			
Total		**1,591**			
Source: APC, STR					

A few observations stand out from the table above:

1. There is a serious shortage of high-quality lodging options in the area. Firstly, there is no hotel above the upscale level within a five-mile radius ring of the Project site. Secondly, even the two upscale options (Courtyard Vallejo/Napa Valley, and DoubleTree Napa Valley) are below par in quality, services, size and appeal for the upscale level based on the Consulting Team's firsthand experience and interviews with guests at those two hotels.
2. This is a highly segmented hotel market with 26 hotels offering a mere total of 1,591 hotel rooms. This translates to an average of only 61 rooms per hotel. 13 out of the 26 hotels (50 percent) are independently owned and run with no associated brand, loyalty program, or marketing, and these 13 hotels account for 28 percent of the total room stock. A highly segmented market usually means a weak and less competitive market with a sizable unmet demand.

3. It is surprising and somewhat concerning to see that the majority of these 26 hotels where built more than 40 years ago, and some were even built around a century ago. Only two hotels in the market were built after 1990, and the most recent one was built in 2006.

4. Each of the 19 hotels within a 2.9-mile distance radius from the Project site is an economy scale hotel or independent hotel. This represents a huge void in the hotel offerings near the site.

The four key observations above reaffirmed the Consulting Team's recommendation above that it would be optimal to build two hotels at the upper upscale level (four-star) or one hotel building at the upper upscale level (four-star) and one building at the upscale level (three-star).

An upper upscale hotel will fill a glaring market void to appeal to family travelers and business travelers to the area, and a newly built upscale hotel will also cater to travelers that currently have no interest in any of the outdated subpar hotels in the area. APC believes neither the upper upscale hotel nor the upscale hotel will pose any meaningful competitive impact to the existing hotel room stock in the area, and moreover, an argument could be made that these new lodging options would make traveling to this area more appealing to the public, and in return increases visitation and positively impact the hotel performances.

COMMERCIAL SPACE COMPETITIVE IMPACT

Alternative C includes two commercial buildings, a large building with 120,474 sq ft, and a smaller boutique facility with 9,228 sq ft of space. The area to the south of this development is already replete with a tremendous amount of retail and commercial space, including a major power shopping center containing a COSTCO, Target, Home Depot, Best Buy, Kohls, dozens of smaller national brands as well as independent retailers. The Columbus Parkway exit of I-80 is the shopping and commercial destination for residents of southern Solano County.

The area around Columbus Parkway and to the south continues to evolve as a major commercial center with new projects in various stages of development. Demand for additional commercial and retail space continues unabated. A commercial/retail development along the north side of Columbus Parkway would serve a number of purposes. It would alleviate congestion as vehicles enter the auto mall and retail center to the south, and offer residents alternative forms of retail/commercial space including low-rise offices and retail options that require less square footage than traditional big box retailers. The two hotels will also require different styles of retail development more appropriate to overnight guests. This evolution of retail and commercial space is expected to enhance retail and commercial options in the area.

PRO FORMA REVENUE FORECAST (ALTERNATIVE C)

Alternative C - Pro Forma Revenue Forecast

	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
DEPARTMENTAL REVENUES					
Hotel	$ 19.1	$ 21.2	$ 21.6	$ 22.1	$ 22.5
Commercial Space	$ 53.9	$ 63.4	$ 65.3	$ 67.3	$ 69.3
TOTAL Revenue ($m)	**$ 73.0**	**$ 84.6**	**$ 87.0**	**$ 89.4**	**$ 91.8**
Source: APC					

ECONOMIC IMPACT STUDY

APC was engaged by the Company to prepare an Economic Impact Study to determine the economic impacts of the Project. The Company further asked that the Consulting Team prepare this Economic Impact Study for the three alternatives as described below.

Alternative A – Proposed
Alternative A is the proposed project. It consists of a development that will include a casino, restaurants, events/multi-purpose space, and associated parking and infrastructure. In addition to the casino complex, it includes a Tribal housing and community development, comprised of 24 single-family residences, necessary infrastructure, and an adjacent Tribal administration building.

Alternative B- Reduced Intensity Alternative
Alternative B is the Reduced Intensity Alternative. It consists of a development that will include a casino, restaurants, events/multi-purpose space, and associated parking and infrastructure. It does not include Tribal housing or Tribal administration building.

Alternative C
Alternative C consists of two hotels, two commercial buildings, Tribal housing, and Tribal administration buildings. Specifically, Alternative C includes two hotels, each with 132 lodging units, its own café, and limited meeting space. Tribal housing consists of 40 townhomes. Alternative C does not include a casino or related amenities.

METHODOLOGY

The Consulting Team utilized the Input-Output/Social Accounting Matrix Model ("I-O/SAM"). The Input-Output economic model depicts how the total Output of each industry in an economy depends on inter-industry demands and final demands by putting transactions in a matrix framework. A project of this scope, particularly Alternative A and Alternative B, will have significant effects and benefits on other industries in its trade area. The I-O/SAM model measures those effects by using a series of multipliers. These multipliers consider all aspects of the Input-Output framework, including what inputs and outputs will come from the subject region. APC calculated the effects on Total Output, Number of Jobs, Labor Income, and incremental federal, state and county taxes. Analyses were prepared for two distinct phases: the Construction Phase and the Operations Phase.

APC utilized the IMPLAN system, an industry standard and widely accepted economic impact assessment software system. The system's model combines extensive databases of economic factors, multipliers, and demographic data, allowing users to develop local level models to estimate economic impacts for a given project. The model achieves this by identifying Direct impacts by economic sector and then develops a set of Indirect and Induced impacts by utilizing industry specific multipliers, local/regional purchase coefficients, income to output ratios, and other factors. IMPLAN's datasets consist of database information for over 500 different industries (NAIC level classification), and a multitude of different economic variables. This data is used with national Input-Output (I-O) matrices that detail interrelationships between economic sectors and includes schedules of Social Accounting Matrix data.

Simplifying further, the Input-Output economic model represents how the total output of each industry in an economy depends on the inter-industry demands and final demands by modeling transactions through a matrix framework. A large-scale casino-resort project will have significant impacts and effects on other industries in a defined trade area. The I-O/SAM model measures these impacts by using a series of multipliers. These multipliers consider all aspects of the Input-Output framework, including which inputs and outputs will come from the subject region or study area. The Consulting Team defined the study area as Solano County to estimate countywide benefits. The degree of impact and benefits for a given study area may vary due to where the Project's managers ultimately hire construction firms, vendors, and employees.

TERMS AND DEFINITIONS

CONSTRUCTION PHASE AND OPERATIONS PHASE

Impacts will occur in two very distinct phases; these phases are known as the Construction Phase and the Operations Phase. Naturally, the Construction Phase will stimulate the economy in the defined study area due to the hiring of local and regional contractors, construction workers, as well as the procurement of construction materials. These activities are considered temporary and non-recurring and will benefit the economy for one particular window of time. Nevertheless, the construction of a large-scale casino-resort will have a significant impact on the economy with some ripple effects after the Construction Phase is complete. These ripple effects occur and benefit the economy as construction workers and suppliers re-spend the money earned in the local economy, essentially creating a multiplier effect. This activity provides further benefits to businesses in the economy resulting from the incremental spending ability of those workers and businesses. Once construction is complete and the Project is operational, the economy will then benefit on a recurring annual basis during the Operations Phase.

CONSTRUCTION PHASE

The Construction Phase begins with the selection of a general contractor and project managers. Their activities stimulate other area businesses as the general contractor hires subcontractors, procures materials from various companies, and hires workers. These activities in turn stimulate household spending in the study area.

It is also important to note that procurement of certain materials and equipment may be purchased through local or regional suppliers/dealers, although the goods may have been manufactured outside of the study area. In these occurrences, the procurement of these goods and supplies are recorded as a local transaction, as is the case with slot machine and table game purchases for the Project.

Construction activities typically have high multipliers because of the significant volume of labor input required, and the procurement of construction materials needed to complete a construction project. For instance, if slot machines made in Nevada are distributed and sold by a manufacturer based in Nevada to an operator in California, then the event is captured as an import from outside of the study area.

Conversely, if slot machines are produced by a company or wholesaled and sold to an operator within its study area, then the IMPLAN model records this as a local transaction from a wholesale sector to the operator. A regional purchase coefficient (RPC) records the amount of each item that is procured from local businesses and how much from other regions in the U.S. and foreign countries. The Consulting Team utilized historical RPCs to calculate each impact.

OPERATIONS PHASE

During the Operations Phase there will be a series of economic benefits stimulated by the operations of the casino and all of its amenities. These benefits are recurring and will provide sustained stimulation to the economy on an annual ongoing basis. For example, just prior to opening, employees will be hired and trained. Once the property is open, they will become employees. The economic benefit will be in the form of wages and salaries paid to these workers, or Labor Income benefit. Additionally, once the Project opens, significant revenue inflows will occur and benefit the subject economy.

DIRECT, INDIRECT, AND INDUCED IMPACTS

For each impact, the Consulting Team estimated Total Output, Employment (jobs created), Labor Income (wages and salaries earned), Total Output, and Taxes Paid.

The Direct, Indirect, and Induced impacts describe the types of output generated. These terms are best defined by using real world examples.

EMPLOYMENT DIRECT IMPACT

Using Employment as an example, the Direct Employment impact refers to the jobs created by the subject facility. Hospitality operations and casino projects in particular, require large amounts of labor in both the Construction Phase and Operations Phase. In this study, the Direct Impact on Employment are the jobs created by the Project.

EMPLOYMENT INDIRECT IMPACT

Indirect Impacts are caused by inter-industry transactions. In order to provide goods and services to its customers, casinos need inputs from other companies and vendors such as utility providers, food suppliers, janitorial suppliers, and private bus companies. A regional food distributor may have to hire additional delivery drivers and warehouse personnel to properly serve the casino resort’s kitchens and restaurants. A commercial laundry would be engaged to supply linens for the Project’s restaurants, and would in turn have to hire additional personnel to fulfill that function. A bus company that is contracted by the casino to provide line runs will have to hire additional drivers. This demand for other industries’ goods and services creates jobs in other industrial sectors (Indirect Employment).

EMPLOYMENT INDUCED IMPACT

Induced impacts are the factor-institution interactions of labor and capital. When the casino’s staff of newly employed workers get paid, these workers spend money at various businesses in the study area economy. They shop at the local mall, the neighborhood supermarket, big box retailers, and other stores, and they purchase products and services. Those businesses in turn will have to increase staff to service those customers. While this spending and consumption is not related to the casino-resort’s customer expenditures, it does create an incremental set of jobs at retail stores and service establishments. Additionally, those new employees hired by other service providers to service the resort's employees in turn spend money at other area merchants, thus creating additional jobs. This is referred to as the Induced Employment impact.

TOTAL OUTPUT

IMPLAN defines the total annual production value of each Industry or Commodity as Output. Output is in producer prices and includes net of inventory changes. Output is revenue except for in the case of retail sales, or if there are additions/deletions to inventory. For all Industries, Output equals the value of production. For service industries other than wholesale and retail, the value of production equals revenue.

Since Output is the total production value of an Industry, it includes all components of production value or Output for a given Industry. This is referred to as the Leontief Production Function.[1]

CONSTRUCTION PHASE IMPACTS

PROJECT CONSTRUCTION COSTS

In preparing the Construction Phase economic benefit analysis, the Consulting Team utilized IMPLAN's regional purchase coefficients as investments in construction activities are anticipated to remain within the study area. The primary inputs into the model are construction costs. The table below details construction cost estimates for the casino project.

Construction and Development Costs	
Category	**Total Cost**
Casino	$ 306,000,000
Food & Beverage	$ 54,000,000
Other	$ 88,000,000
Parking Garage	$ 114,000,000
Total Back of House	$ 211,000,000
Construction Costs	**$ 773,000,000**
Development Costs	$ 665,000,000
Grand Total	**$ 1,438,000,000**
Source: APC	

[1] https://support.implan.com/hc/en-us/articles/115009668388-Output

SUMMARY OF ANALYSIS

The tables below summarize Total Output, Employment (number of jobs), Labor Income, and Additional Taxes generated from the Construction Phase for Alternative A, Alternative B, and Alternative C. Detailed analyses can be found in the appendix of this report.

Est. Economic Benefits During Construction (Alternative A)				
in millions ex. employment	Direct	Indirect	Induced	Total
Output	$ 1,407	$ 167	$ 239	$ 1,813
Employment	6,704	875	1,401	8,980
Labor Income	$ 509	$ 39	$ 69	$ 617
in millions	Federal	State	County	Total
Additional Tax Receipts	$ 157	$ 65	$ 7	$ 229
Source: APC				

Est. Economic Benefits During Construction (Alternative B)				
in millions ex. employment	Direct	Indirect	Induced	Total
Output	$ 1,392	$ 166	$ 236	$ 1,794
Employment	6,634	866	1,387	8,887
Labor Income	$ 504	$ 38	$ 68	$ 611
in millions	Federal	State	County	Total
Additional Tax Receipts	$ 169	$ 65	$ 7	$ 240
Source: APC				

Est. Economic Benefits During Construction (Alternative C)				
in millions ex. employment	Direct	Indirect	Induced	Total
Output	$ 173	$ 21	$ 29	$ 224
Employment	827	108	173	1,107
Labor Income	$ 63	$ 5	$ 8	$ 76
in millions	Federal	State	County	Total
Additional Tax Receipts	$ 19	$ 8	$ 1	$ 28
Source: APC				

TOTAL CONSTRUCTION OUTPUT

Total Output measures the value of goods and services that go into the construction and construction-related activities in conjunction with the Direct, Indirect and Induced impacts in the study area’s economy. For Alternative A, the Direct Impact from construction related activities and procurement of materials is estimated at 1.4 billion. The Indirect Impact resulting from these developments are estimated at $167 million. The Induced Impact is estimated at $239 million. Total Output for all three impacts is estimated at $1.8 billion.

For Alternative B, the Direct Impact from construction related activities and procurement of materials is estimated at 1.39 billion. The Indirect Impact resulting from these developments are estimated at $166 million. The Induced Impact is estimated at $236 million. Total Output from all three impacts is estimated at $1.79 billion.

For Alternative C, the Direct Impact from construction related activities and procurement of materials is estimated at $173 million. The Indirect Impact resulting from these developments are estimated at $21 million. The Induced Impact is estimated at $29 million. Total Output from all three impacts is estimated at $224 million.

TOTAL CONSTRUCTION EMPLOYMENT

For Alternative A, the Direct Impact from construction related activities on Employment is estimated at 6,704 jobs. The Indirect Impact on Employment resulting from these activities is estimated at 875 jobs. The Induced Impact is estimated at 1,401 jobs. The total number of jobs created during the Construction phase is estimated at 8,980.

For Alternative B, the Direct Impact from construction related activities on Employment is estimated at 6,634 jobs. The Indirect Impact on Employment resulting from these activities is estimated at 866 jobs. The Induced Impact is estimated at 1,387 jobs. The total number of jobs created during the Construction Phase is estimated at 8,887.

For Alternative C, the Direct Impact from construction related activities on Employment is estimated at 827 jobs. The Indirect Impact on Employment resulting from these activities is estimated at 108 jobs. The Induced Impact is estimated at 173 jobs. The total number of jobs created during the Construction Phase is estimated at 1,107.

TOTAL CONSTRUCTION LABOR INCOME

For Alternative A, the Direct Impact from construction on Labor Income is estimated at $509 million. The Indirect Impact on Labor Income is estimated at $39 million. The Induced Impact is estimated at $69 million. The Total Impact on Labor Income is estimated at $617 million.

For Alternative B, the Direct Impact from construction on Labor Income is estimated at $504 million. The Indirect Impact on Labor Income is estimated at $38 million. The Induced Impact is estimated at $68 million. The Total Impact on Labor Income is estimated at $611 million.

For Alternative C, the Direct Impact from construction on Labor Income is estimated at $63 million. The Indirect Impact on Labor Income is estimated at $5 million. The Induced Impact is estimated at $8 million. The Total Impact on Labor Income is estimated at $76 million.

ADDITIONAL TAXES FROM CONSTRUCTION PHASE

The Construction Phase is expected to generate a considerable amount of incremental tax revenues. For Alternative A, the Project will generate $157 million in additional federal taxes, $65 million in state taxes, and $7 million in county taxes. In total, Alternative A will generate $229 million in additional taxes.

For Alternative B, the Project will generate $169 million in additional federal taxes, $65 million in state taxes, and $7 million in county taxes. In total Alternative B will generate an incremental $240 million in taxes.

For Alternative C, the Project will generate $19 million in federal taxes, $8 million in state taxes, and $1 million in county taxes. In total Alternative C will generate $28 million in additional taxes.

OPERATIONS PHASE IMPACTS

To estimate the ongoing economic benefits during the Operations Phase, the Consulting Team utilized the pro forma revenue forecasts presented in "Casino Market Study" and "Hotel and Commercial Space Study" chapters earlier in this report. As such, various elements were evaluated for model inputs including revenues and staffing inputs for employment as estimated by APC.

ALTERNATIVES A AND B PRO FORMA REVENUE FORECAST

Revenue forecasts for Alternative A and Alternative B are identical since Tribal housing and administration are the only variances, and are not expected to have a measurable impact on gross revenues. Below is the forecast of the first five years of operation. All Operations Phase impacts are calculated for Year 2, or 2029.

Alternatives A & B - Pro Forma Revenue Forecast

	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
TOTAL GGR	$ 827.1	$ 914.7	$ 928.7	$ 947.3	$ 966.3
TOTAL NON-GAMING	$ 96.2	$ 108.2	$ 110.2	$ 112.7	$ 115.2
TOTAL GROSS REVENUE	**$ 923.3**	**$ 1,022.9**	**$ 1,038.9**	**$ 1,060.0**	**$ 1,081.5**
(-) Promo and Marketing Comps	$ 82.4	$ 86.5	$ 83.7	$ 85.3	$ 87.1
NET REVENUE	**$ 840.9**	**$ 936.5**	**$ 955.3**	**$ 974.7**	**$ 994.4**

Source: APC

ALTERNATIVE C

Pro forma revenue forecast for Alternative C, the hotel and commercial space scenario without a casino, is summarized in the table below.

Alternative C - Pro Forma Revenue Forecast	Year 1 2028	Year 2 2029	Year 3 2030	Year 4 2031	Year 5 2032
DEPARTMENTAL REVENUES					
Hotel	$ 19.1	$ 21.2	$ 21.6	$ 22.1	$ 22.5
Commercial Space	$ 53.9	$ 63.4	$ 65.3	$ 67.3	$ 69.3
TOTAL Revenue ($m)	**$ 73.0**	**$ 84.6**	**$ 87.0**	**$ 89.4**	**$ 91.8**
Source: APC					

SUMMARY OF ANALYSES

The tables below summarize Total Output, Employment (number of jobs), Labor Income, and Additional Taxes generated from the Operations Phase for Alternative A & Alternative B, and Alternative C. All Operations Phase impacts are calculated based on Year 2 of operation, or 2029.

Est. Economic Benefits During Operation (Alternatives A & B)				
in millions ex. employment	Direct	Indirect	Induced	Total
Output	$ 937	$ 260	$ 108	$ 1,304
Employment	3,640	1,685	636	5,960
Labor Income	$ 197	$ 57	$ 31	$ 285
in millions	Federal	State	County	Total
Additional Tax Receipts	$ 79	$ 46	$ 16	$ 142
Source: APC				

Est. Economic Benefits During Operation (Alternative C)				
in millions ex. employment	Direct	Indirect	Induced	Total
Output	$ 87	$ 24	$ 10	$ 121
Employment	527	157	59	743
Labor Income	$ 18	$ 5	$ 3	$ 27
in millions	Federal	State	County	Total
Additional Tax Receipts	$ 7	$ 4	$ 0	$ 12
Source: APC				

TOTAL OUTPUT DURING OPERATIONS

Total Output measures the total spending by the casino-resort's patrons, including labor income less expenditures that occur outside of the study area. For Alternative A and Alternative B, the Direct Output from casino-resort operations is estimated at $937 million. Indirect Output resulting from operations, which emanate from economic activities of casino suppliers and has a ripple effect in the regional economy is estimated at $260 million. The Induced Output is projected at $108 million. Total Output is estimated at $1.3 billion.

For Alternative C, the Direct Output is estimated at $87 million. Indirect Output from the two hotels and ancillary operations is estimated at $24 million. Induced Output is projected at $10 million. Total Output is estimated at $121 million.

TOTAL EMPLOYMENT DURING OPERATIONS

The Direct Impact of Employment during the Operations Phase refers to the direct staffing levels of the casino resort.

For Alternative A and Alternative B, the Direct Impact from the Operations Phase on Employment is estimated at 3,640. The Indirect Impact on Employment is estimated at 1,685. The Induced Impact is estimated at 636 jobs. In total, the Project is forecast to generate a total of 5,960 jobs across the region.

For Alternative C, the Direct Impact from the Operations Phase on Employment is estimated at 527. The Indirect Impact on Employment resulting from operations is estimated at 157. The Induced Impact is estimated at 59 jobs. In total, the total number of jobs created by Alternative C is 743.

TOTAL LABOR INCOME DURING OPERATIONS

As a result of the creation of these Direct jobs, the Direct Impact from operations for Alternative A and Alternative B on Labor Income is estimated at $197 million. The Indirect Impact on Labor Income is estimated at $57 million. The Induced Impact is estimated at $31 million. In total, the Project will generate $285 million in Labor income.

The Direct Impact from operations for Alternative C on Labor Income is estimated at $18 million. The Indirect Impact on Labor Income is estimated at $5 million. The Induced Impact is estimated at $3 million. Total Labor Income is estimated at $27 million.

ADDITIONAL TAXES FROM OPERATIONS PHASE

The Operations Phase is expected to generate a considerable amount of incremental tax revenues. For Alternative A and Alternative B, the Project will generate $79 million in federal taxes, $46 million in state taxes, and $16 million in county taxes. In total, Alternative A and Alternative B will generate $142 million in incremental taxes.

For Alternative C, the Project will generate $7 million in federal taxes, $4 million in state taxes and $0.1 million in county taxes.

Please note that all property taxes have been excluded in the above tax calculation because all alternatives will be constructed and operated on Tribal land put into trust, so no property taxes will be collected.

COMMUNITY IMPACTS ANALYSIS

The introduction of casino gaming into a host community can have both positive and negative impacts. Job creation, increased economic activity in and around the casino enterprise, and increased tax collection to fund local services are examples of positive impacts. There are, nonetheless, negative impacts on the community including the impact on housing and schools, as well as increased demand for police and fire protection, and emergency medical services. The introduction of a casino into a host community also increases the number of people within the community that may develop pathological gambling behavior as well as increases in petty crime in and around the casino enterprise.

This chapter examines various economic and social impacts for Alternative A and Alternative B, the two alternatives with the proposed casino.

POPULATION AND INCOME TRENDS

The Project is located in the city of Vallejo within Solano County. Solano County is located approximately 45 miles northeast of San Francisco, and 45 miles southwest of Sacramento. Solano County is bordered by Napa, Yolo, Sacramento, and Contra Costa counties. It covers 909 square miles including 84.2 square miles of water area and 675 square miles of rural land area. Much of the county's population is concentrated in three cities, Vallejo, Fairfield, and Vacaville. The city of Vallejo, located near the county's southwest border with Contra Cosa County, is the county's largest city. Fairfield, the county's second largest city in terms of population, serves as the county's seat of government.

The tables below detail population and income trends for the county and its five largest cities.

Solano County Total Population			
City	2017 Population	2023 Population	CAGR ('17-'23)
Vallejo	122,205	123,091	0.1%
Fairfield	118,219	119,338	0.2%
Vacaville	98,303	101,918	0.6%
Benicia	27,091	26,660	(0.3%)
Suisun City	29,264	29,508	0.1%
Solano County	**434,981**	**449,218**	**0.5%**
Source: APC, World Population Review, Neilsberg Research, Data USA			

Solano County Adult Population (21+)			
City	2017 Population	2023 Population	CAGR ('17-'23)
Vallejo	94,512	96,305	0.3%
Fairfield	90,785	92,157	0.3%
Vacaville	75,824	78,500	0.6%
Benicia	20,437	20,035	(0.3%)
Suisun City	22,705	22,892	0.1%
Solano County	**320,213**	**333,514**	**0.7%**
Source: APC, World Population Review, Neilsberg Research, Data USA			

Solano County Average Annual Household Income			
City	**2017**	**2023**	**CAGR ('17-'23)**
Vallejo	$65,000	$78,243	3.1%
Fairfield	$70,000	$82,350	2.8%
Vacaville	$85,000	$97,683	2.4%
Benicia	$90,000	$106,000	2.7%
Suisun City	$65,500	$75,000	2.3%
Solano County	**$74,000**	**$92,959**	**3.8%**
Source: Solano County Economic Development Corp, Data USA			

SOLANO COUNTY

Solano County's population stood at 449,218 as of 2023, and experienced a five-year compounded annual growth rate (CAGR) of 0.5 percent. Looking at the adult population (aged 21+), a slightly nuanced picture appears. Solano County's adult population stood at 333,514 and comprised 74 percent of the total population with a CAGR of 0.7 percent. The three largest cities though, had a greater percent of their populations aged 21+ as examined below.

In 2023, Solano County's average annual household income (AAHI) stood at $92,959 compared to a statewide average of $134,900.

VALLEJO

Vallejo has a population of 123,091 and experienced a CAGR of 0.1 percent from 2017 to 2023. Vallejo had a 2023 adult population of 96,305, which in turn comprised 78 percent of the city's total population. Furthermore, the adult population grew at a CAGR of 0.3 percent. Vallejo also makes up 27.4 percent of the total population in Solano County.

Vallejo has historically lagged behind other cities in the region in terms of AAHI. In 2023, AAHI stood at $78,243, having experienced a five-year CAGR of 3.1 percent.

FAIRFIELD

Fairfield is 15 miles north of Vallejo. Fairfield's population stood at 119,338 in 2023 and had a five-year CAGR of 0.2 percent. Its adult population was 92,157. Similar to Vallejo, Fairfield's adult population comprised 77 percent of total population and had a CAGR 0.3 percent. AAHI in 2023 was $82,350 and experienced a five-year CAGR of 2.8 percent.

VACAVILLE

Vacaville is 22 miles north of Vallejo. In 2023, it had a total population of 101,918 and a five-year CAGR of 0.6 percent. Similar to Vallejo and Fairfield, its adult population, which stood at 78,500, comprised 78 percent of the city's total population and had a CAGR of 0.6 percent. Vacaville also had a higher AAHI than the two aforementioned cities, which stood at $97,683 in 2023, having experienced a five-year CAGR of 2.4 percent.

BENICIA

Benicia is located 11 miles southeast of Vallejo and is the closest city in the county to the San Francisco Bay Area. It is also considerably smaller than the county's three largest cities, with a 2023 population of 26,660. Total population actually contracted and recorded a five-year CAGR of -0.3 percent. Its adult population stood at 20,035 and made up 75 percent of the city's total population. It experienced a five-year CAGR of -0.3 percent. Benicia's AAHI was substantially higher at $106,000 in 2023, having experienced a five-year CAGR of 2.7 percent.

SUISUN CITY

Suisun City is 15 miles northeast of Vallejo, roughly in between Fairfield and Vacaville. Its 2023 population was 29,508, having grown at a modest 0.1 percent. Its adult population was 22,892 in 2023, and made up 78 percent of the city's total population and had a five-year CAGR of 0.1 percent. Its AAHI in 2023 was the lowest of the five cities and stood at $75,000. It also had the lowest CAGR of the five cities at 2.3 percent.

OBSERVATIONS ON POPULATION AND INCOME TRENDS

The populations in the three largest cities in Solano County are considerably older than the county as a whole as well as cities in other counties. While this bodes well for entertainment facilities such as casinos that tend to attract older demographics, it also means that there is a lesser impact on schools and other services required by young families. That is offset by increased demand for medical and social services to better serve the needs of an older population.

EMPLOYMENT TRENDS

The ability for a region to supply a sufficient number of employees for a development the size and scope of Alternative A is a critical factor for not only the Project's long-term success but economic growth in the region. To better understand the region's ability to provide a sufficient number of employees, APC examined recent employment trends as detailed in the table below.

SOLANO COUNTY

In 2022, Solano County had an unemployment rate of 4.6 percent. In 2023, that rate fluctuated from a low of 4.5 percent in April to a high of 5.7 percent in January and February. As of December of 2023, Solano County had an unemployment rate of 5.3 percent. Unemployment peaked in 2020 at 17.7 percent during the height of the pandemic, but quickly receded 2022. The unemployment rate was as low as 4.4 percent in 2019. Excluding the pandemic years of 2020/2021, the county's highest annual unemployment rate was 5.4 percent in 2017.

VALLEJO

Vallejo's unemployment rate in 2022 was 4.3 percent and rose steadily in 2023; peaking at 5.6 percent in August; it stood at 4.9 percent in December of 2023. Looking back seven years, 2019 was the city's best year with an annual unemployment rate of 4.0 percent. Its highest annual rate was in 2017 at 5.0 percent.

Solano County Unemployment Rates (in %)						
Year/Month	**Vallejo**	**Fairfield**	**Vacaville**	**Benicia**	**Suisun City**	**Solano County**
23-Dec	4.9	5.0	4.7	4.5	5.2	**5.3**
23-Nov	4.8	5.1	4.6	4.4	5.1	**5.0**
23-Oct	4.7	4.9	4.5	4.3	5.0	**4.9**
23-Sep	4.6	4.8	4.4	4.2	4.9	**4.8**
23-Aug	5.6	5.4	5.3	5.1	5.6	**5.6**
23-Jul	5.2	5.3	5.0	4.8	5.5	**5.2**
23-Jun	5.1	5.1	4.8	4.7	5.4	**5.3**
23-May	4.6	4.7	4.5	4.4	5.0	**4.6**
23-Apr	4.4	4.5	4.3	4.2	4.8	**4.5**
23-Mar	4.9	5.0	4.8	4.6	5.3	**5.3**
23-Feb	5.0	5.1	4.9	4.7	5.4	**5.7**
23-Jan	4.9	5.0	4.8	4.6	5.2	**5.7**
2022	**4.3**	**4.4**	**4.2**	**4.1**	**4.5**	**4.6**
2021	**10.8**	**10.5**	**10.1**	**9.9**	**10.7**	**10.9**
2020	**17.7**	**17.5**	**17.2**	**16.9**	**17.6**	**17.7**
2019	**4.0**	**4.1**	**3.9**	**3.8**	**4.3**	**4.4**
2018	**4.4**	**4.5**	**4.3**	**4.2**	**4.7**	**4.5**
2017	**5.0**	**5.1**	**4.9**	**4.8**	**5.3**	**5.4**
Source: California Employment Development Dept						

FAIRFIELD

Fairfield's historic unemployment rate tracked closely to Vallejo and the county, overall. In 2023, the city had its lowest rate in April at 4.5 percent and its highest in August at 5.4 percent. It stood at 5.0 percent in December of 2023.

VACAVILLE

Vacaville has outperformed other cities and the county overall in employment. In 2023, Vacaville had its lowest unemployment rate in April at 4.3 percent and a high in August at 5.3 percent. It finished the year at 4.7 percent. Its best year was in 2019, when it recorded a 3.9 percent unemployment rate.

BENICIA

Historically, Benicia enjoyed a slightly lower unemployment rate than the other cities and the county, overall. In 2023, it had its lowest rate of 4.2 percent in April and its highest in August at 5.1 percent. The unemployment rate stood at 4.5 percent in December, 2023. Its best performing year was 2019 when it had a low of 3.8 percent.

SUISUN CITY

Suisun City has historically had slightly higher unemployment rates than other cities in the county, and the county overall. Its best year was 2019 when it achieved an unemployment rate of 4.3 percent, better than the county average of 4.4 percent. Its slightly elevated unemployment rate could probably be attributed to its somewhat isolated location east of Interstate 80.

OBSERVATIONS ON EMPLOYMENT TRENDS

The county and its cities have historically had unemployment rates that tracked closely with statewide averages. Nevertheless, unemployment rates appear competitive with other regions in the state, enhancing the region's ability to attract new workers. This, coupled with reasonable housing costs, described below, should help the Project attract workers, and add to the economic vitality of the county.

HOUSING TRENDS

The availability of affordable housing will play an important role in the Project's ability to attract and retain a stable workforce.

To appreciate housing prices in the region, one must first consider the cost of housing in the State of California, and the Bay Area, in particular. In 2023, eight of the most expensive housing markets in the United States were in California, and two of the top three most expensive markets were adjacent or proximate to Solano County.

Top 10 Most Expensive Housing Markets in the US

Rank	Region	State	Median Price	YOY Change
1	San Jose-Sunnyvale-Santa Clara	CA	$1,750,300	11.0%
2	Anaheim-Santa Ana-Irvine	CA	$1,299,500	14.8%
3	San Francisco-Oakland-Hayward	CA	$1,251,000	4.3%
4	Urban Honolulu, Hawaii	HI	$1,069,400	-1.9%
5	Salinas	CA	$993,900	17.1%
6	San Diego-Carlsbad	CA	$931,600	8.7%
7	Oxnard-Thousand Oaks-Ventura	CA	$916,800	7.9%
8	San Luis Obispo-Paso Robles	CA	$912,100	5.7%
9	Los Angeles-Long Beach-Glendale	CA	$884,400	6.7%
10	Boulder	CO	$849,400	11.8%

Source: National Association of Realtors

The tables below detail housing prices for Solano County and its five largest cities, and total units and vacancy rates.

Solano County Median Home Prices

City	2017	2018	2019	2020	2021	2022	2023
Vallejo	$382,000	$407,000	$435,000	$455,000	$485,000	$520,000	$545,000
Fairfield	$450,000	$475,000	$490,000	$510,000	$540,000	$570,000	$600,000
Vacaville	$470,000	$490,000	$510,000	$535,000	$560,000	$590,000	$615,000
Benicia	$600,000	$620,000	$650,000	$675,000	$700,000	$730,000	$750,000
Suisun City	$410,000	$425,000	$440,000	$460,000	$480,000	$500,000	$520,000
Solano County	**$445,000**	**$460,000**	**$480,000**	**$505,000**	**$530,000**	**$560,000**	**$580,000**

Source: Redfin, Zillow

Solano County Total Units and Housing Vacancy Rates (2017-2023)				
City	2017 Total Units	2017 % Vacant	2023 Total Units	2023 % Vacant
Vallejo	46,251	5.10%	47,000	4.50%
Fairfield	36,000	5.30%	37,200	5.00%
Vacaville	36,200	4.20%	37,500	4.00%
Benicia	11,250	3.70%	11,500	3.50%
Suisun City	9,800	5.60%	10,100	5.20%
Solano County	**151,200**	**4.90%**	**154,000**	**4.60%**
Source: Redfin, Zillow, U.S. Census Bureau				

SOLANO COUNTY

In 2023, Solano County had a median home price of $580,000. Home prices have risen steadily since 2017 when the median price was $445,000. Available housing units have increased only modestly from 2017 to 2023 with 154,000 units available at the end of the year. The vacancy rate was 4.6 percent.

VALLEJO

In 2023, the city of Vallejo had a median home price of $545,000. Like the county, prices have increased steadily since 2017, albeit at a more aggressive rate. In 2017, the median home price was $382,000. Available units only increased marginally from 46,251 in 2017 to 47,000 in 2023. The vacancy rate was 4.5 percent.

FAIRFIELD

In 2023, Fairfield had a median home price of $600,000. Like the county, prices have increased steadily since 2017. In 2017, the median home price was $450,000. Available units only increased from 36,000 in 2017 to 37,200 in 2023. The vacancy rate was 5.0 percent.

VACAVILLE

In 2023, Vacaville had a median home price of $615,000. Like the county, prices have increased steadily since 2017. In 2017, the median home price was $470,000. Available units only increased from 36,200 in 2017 to 37,500 in 2023. The vacancy rate was 4.0 percent.

BENICIA

In 2023, Benicia had a median home price of $750,000, by far the highest in the county. Prices have increased steadily since 2017 when the median home price was $600,000. Available units barely increased from 11,250 in 2017 to 11,500 in 2023. The vacancy rate was 3.5 percent, the lowest in the county. Benicia's proximity to the Bay Area and attractive location played a large part in driving up home prices.

SUISUN CITY

In 2023, Suisun City had a median home price of $520,000. Like the county, prices have increased steadily since 2017. In 2017, the median home price was $410,000. Available units only increased from 9,800 in 2017 to 10,100 in 2023. The vacancy rate was 5.2 percent, the highest in the county.

FORECASTED IMPACT ON HOUSING TRENDS AND AVAILABILITY

Of all economic indices, trends within the housing market bode well for future economic and population growth. Compared to home prices in other parts of the Bay Area, prices in Solano County remain affordable. This alone should attract workers from other parts of the state. The region also has available land to accommodate future growth.

APC conducted five case studies to examine the impacts of a casino opening on the housing trends of the area. All five case studies are for casinos opened after 2019. Three case studies are in the north Bay Area with close proximity to the Project. One case study is in the Midwest, and one case study is on the east coast. The three north Bay Area case studies are shown below.

Case Study #1

Subject: Amador County, CA
Time Frame: 2018-2023
Re: Harrah's Northern California Opening in May 2019

	Median Home Price			Total Units			% Vacancy		
City	2018	2023	CAGR %	2018	2023	CAGR %	2018	2023	delta
Ione	$340,000	$450,000	5.8%	4,800	5,000	0.8%	4.5%	4.0%	(0.5%)
Jackson	$360,000	$470,000	5.5%	3,500	3,700	1.1%	4.0%	3.8%	(0.2%)
Sutter Creek	$370,000	$480,000	5.3%	2,200	2,300	0.9%	5.2%	4.9%	(0.3%)
Amador County	**$350,000**	**$460,000**	5.6%	**13,500**	**14,000**	0.7%	**4.5%**	**4.2%**	**(0.3%)**

Sources: Redfin, Zillow, Realtor.com, U.S. Census Bureau

Case Study #2

Subject: Sacramento County, CA
Time Frame: 2018-2023
Re: Sky River Casino Opening in Aug 2022

	Median Home Price			Total Units			% Vacancy		
City	2018	2023	CAGR %	2018	2023	CAGR %	2018	2023	delta
Elk Grove	$445,000	$560,000	4.7%	51,000	53,000	0.8%	4.5%	4.0%	(0.5%)
Galt	$385,000	$490,000	4.9%	10,500	11,000	0.9%	5.2%	4.8%	(0.4%)
Sacramento County	**$385,000**	**$499,000**	5.3%	**580,000**	**600,000**	0.7%	**4.6%**	**4.2%**	**(0.4%)**

Sources: Redfin, Zillow, Realtor.com, U.S. Census Bureau

Case Study #3

Subject: Yuba County, CA
Time Frame: 2018-2023
Re: Hard Rock Sacramento Opening in Nov 2019

	Median Home Price			Total Units			% Vacancy		
City	2018	2023	CAGR %	2018	2023	CAGR %	2018	2023	delta
Wheatland	$320,000	$410,000	5.1%	5,500	6,000	1.8%	4.7%	4.3%	(0.4%)
Linda	$280,000	$370,000	5.7%	10,000	10,500	1.0%	5.2%	4.8%	(0.4%)
Olivehurst	$290,000	$380,000	5.6%	8,500	9,000	1.1%	5.1%	4.7%	(0.4%)
Marysville	$300,000	$390,000	5.4%	7,000	7,500	1.4%	4.9%	4.5%	(0.4%)
Plumas Lake	$310,000	$400,000	5.2%	6,500	7,000	1.5%	4.8%	4.4%	(0.4%)
Yuba County	**$300,000**	**$390,000**	**5.4%**	**37,500**	**40,000**	**1.3%**	**5.0%**	**4.6%**	**(0.4%)**

Sources: Redfin, Zillow, Realtor.com, U.S. Census Bureau

The cities in the call-out boxes above are the host cities of the casino. The remaining cities are the key municipalities in each county, and then the data for the entire county is provided. A close look at the findings from the three above case studies show no significant changes in housing trends for the casino host cities compared to other cities in the same county. The vacancy rates show no significant difference between casino host cities and other cities in each case study, but they are all falling since 2018, confirming the housing shortage issue the entire nation is facing. While not significant, the growth rates of the total units in all three casino host cities above are all slightly higher than the growth rates for all three counties, and this is a great testament to one of the benefits of opening a casino. It stimulates construction and helps ease the housing shortage issue overall.

The two non-California case studies are shown below.

Case Study #4

Subject:	Lake County, IL
Time Frame:	2018-2023
Re:	American Place Waukegan Opening in Feb 2023

	Median Home Price			Total Units			% Vacancy		
City	2018	2023	CAGR %	2018	2023	CAGR %	2018	2023	delta
Waukegan	$135,000	$180,000	5.9%	32,000	33,000	0.6%	6.5%	5.8%	(0.7%)
Gurnee	$260,000	$320,000	4.2%	12,500	13,000	0.8%	4.2%	3.9%	(0.3%)
North Chicago	$120,000	$165,000	6.6%	7,500	8,000	1.3%	7.0%	6.2%	(0.8%)
Lake County	**$270,000**	**$356,000**	5.7%	**278,000**	**290,000**	0.8%	**5.3%**	**4.9%**	**(0.4%)**
Sources: Redfin, Zillow, Realtor.com, U.S. Census Bureau									

Case Study #5

Subject:	The Commonwealth of Virginia
Time Frame:	2018-2023
Re:	Caesars Danville Opening in May 2023 and Rivers Portsmouth Opening in Jan 2023

	Median Home Price			Total Units			% Vacancy		
City/State	2018	2023	CAGR %	2018	2023	CAGR %	2018	2023	delta
Danville	$120,000	$170,000	7.2%	20,000	21,000	1.0%	6.0%	5.5%	(0.5%)
Portsmouth	$210,000	$260,000	4.4%	40,000	42,000	1.0%	5.5%	5.0%	(0.5%)
Virginia	**$285,000**	**$390,000**	6.5%	**3,600,000**	**3,700,000**	0.5%	**4.0%**	**3.8%**	**(0.2%)**
Sources: Redfin, Zillow, Realtor.com, U.S. Census Bureau									

Again, no significant differences in home price growth, total units growth, or vacancy rate change at casino host cities and nearby cities or the county/state as a whole can be observed in these two case studies. Based on the five case studies conducted above, APC believes the opening of the Project will not significantly change the current growth pattern of housing prices in the market.

Another angle to quantify the impact of a casino opening on housing is to start from the total employee count and work out the estimated total migration into the area, or Solano County for the Project. As presented in the earlier "Economic Impact Study" chapter, APC expects the Project to employ a total of 3,640 employees.

During research, APC discovered the data presented in the following two tables on workers and commuters in Solano County and a few neighboring counties. The first table below shows the percentage of workers that work in Solano County but live outside and the percentage of workers that live in Solano County but travel outside for employment.

It is noticeable that currently 49 percent of the Solano County commuters have to seek employment outside their domicile county. This percentage is very high, and significantly higher than the three other benchmark counties in the table, implying a lack of satisfactory jobs within Solano County. This is further confirmed by the percentage of commuters that work within Solano County and live outside at 26 percent. This percentage is significantly lower than the three other benchmark counties too, implying Solano County right now not only fails to keep nearly half of its commuters to work within itself, but also falls way behind other counties in attracting residents of other counties to work within Solano County.

County	Total Commuters	Living Inside, Working Inside Number	%	Living Inside, Working Outside Number	%	Working Inside, Living Outside Number	%
Solano County	261,303	65,332	25.0%	128,082	49.0%	67,889	26.0%
Yolo County	160,939	34,042	21.2%	54,296	33.7%	72,601	45.1%
Napa County	101,120	31,895	31.5%	31,895	31.5%	37,873	37.5%
Marin County	168,888	37,954	22.5%	37,954	22.5%	66,087	39.1%
Sources: APC, Solano County Budgets, U.S. Census Bureau							

Based on the above data, APC believes that if the Project casino comes to fruition, the job opportunities offered by the Project will be more attractive to residents of Solano County than to residents outside Solano County. It also makes the most economical and fiscal sense for Solano County to hope more of these new job opportunities go to employees that reside within its own county limits. In summary, APC assumes no more than 26 percent of the 3,640 direct jobs, or 946 jobs, created at the Project will be taken up by employees who currently reside outside Solano County.

The table above also shows that about one third of the commuters in nearby Yolo County and Napa County are traveling outside of their domicile county for work. The table below also shows that more than one third of commuters in the local market routinely travel more than 25 miles one-way for work. Both findings suggest a high percentage of employees in the region, even if employed by the Project in Solano County, would not move their domicile into Solano County, but rather continue their routine inter-county commute. Moreover, it is highly plausible that a high percentage of the above 946 new hires who do not reside in Solano County already commute into Solano County for work, and getting a new job at the Project will not require or facilitate any change to their current commute and domicile patterns. Based on all the above data and reasoning, APC assumes no more than 15 percent of the 946 new employees hired from outside Solano County, or 142 employees would migrate into Solano County due to the opening and stabilization of the Project.

	Percentage of Commuting Distance (One-Way)		
County	Over 50 miles	Over 25 miles	Over 10 miles
Solano County	18.3%	37.5%	60.0%
Yolo County	23.9%	39.1%	65.4%
Napa County	16.5%	29.9%	61.1%
Marin County	15.4%	33.3%	64.1%
Sources: APC, Solano County Budgets, U.S. Census Bureau			

As estimated by the U.S. Census Bureau data, the city of Vallejo has 2,100 vacant housing units and Solano County has 7,100 vacant housing units as of 2023. With the estimated in-migration employee count capped at 142, APC estimates a maximum incremental housing unit demand of 142, which translates to only 6.7 percent of the current vacant housing units in Vallejo and 2.0 percent of the current vacant housing units in Solano County. Incremental demand at this scale would pose negligible impacts on the current housing availability situation. It is also worth noting that these estimates are ceiling estimates, and the actual impacts would probably be smaller.

FORECASTED IMPACT ON EDUCATION SYSTEM

Educational attainment is an important measure of a community. Educational attainment not only illustrates that a community is attractive to more educated and higher earning residents, those residents in turn demand quality secondary and high school education for their offspring.

A key index of educational attainment is the percent of the population that has achieved an education beyond high school. These include those who attended college, graduated with an associate's degree, bachelor's degree or higher. In Solano County, a total of 69 percent of the adult population attended college. As important, 41 percent graduated with an associate's degree or higher.

In the city of Vallejo, 65 percent of the adult population attended college. 37 percent graduated with an associate's degree or higher. In Fairfield, 70 percent of the adult population had attended college while 41 percent earned an associate's degree or higher. 69 percent of adults in Vacaville attended college and 42 percent earned a degree. Suisun City lags behind other cities in the county. 64 percent attended college and 36 percent earned an associate's degree or higher.

Solano County 2023 Educational Attainment

City	Less than 9th grade	9th to 12th grade	High school graduate	Some college	Associate degree	Bachelor's degree	Graduate / Professional
Vallejo	3%	7%	25%	28%	10%	20%	7%
Fairfield	2%	6%	22%	29%	12%	21%	8%
Vacaville	2%	5%	24%	27%	11%	23%	8%
Benicia	1%	4%	20%	28%	12%	25%	10%
Suisun City	3%	7%	26%	28%	11%	18%	7%
Solano County	**2%**	**6%**	**23%**	**28%**	**11%**	**22%**	**8%**

Source: U.S. Census Bureau

As a county's population grows, demand will grow for schooling for the employees of the Project and other businesses that will generate employment because of the Project. The table below examines the current number of schools within the five largest cities in Solano County. It excludes schools in the smallest cities and unincorporated areas of the county.

Vallejo, the largest city in the county, has a total of 25 elementary schools, ten middle schools, and five high schools. Fairfield, with a slightly smaller population, contains thirty elementary schools, eight middle schools and six high schools. Vacaville has twenty elementary schools, six middle schools and four high schools.

Solano County 2023 Public Educational Facilities			
City	**Elementary Schools**	**Middle Schools**	**High Schools**
Vallejo	25	10	5
Fairfield	30	8	6
Vacaville	20	6	4
Benicia	10	3	2
Suisun City	12	4	3
Source: U.S. Census Bureau, Solano County			

The same methodology used to estimate the potential impact on housing availability because of the Project applies here in calculating the additional enrollment demand on the school districts. With the estimated in-migration employee count capped at 142, APC estimates a maximum of 142 households will migrate into Solano County.

According to the latest U.S. Census Bureau data, there are 2,841,400 children between 6 to 11 years old and 3,104,400 children between 12 to 17 years old across 13,550,586 households in California. This translates to 5,945,800 school age children across 13,550,586 households in California, or 0.439 school age children per household. Multiplying this school age children per household with the estimated 142 in-migrate households yield an estimated increase of 62 school age children in Solano County because of the opening of the Project.

According to Solano County Office of Education, the Vallejo City Unified School District has a total enrollment of 12,215 and all the school districts across Solano County have a total enrollment of 60,232 for the school year 2022-2023. An incremental 62 students that need to enroll in Solano County because of the Project opening equates 0.5 percent of the total enrollment at Vallejo City Unified School District or 0.2 percent of the total enrollment under Solano School District. Incremental demand at this scale only poses negligible impacts on the school districts. It is also worth noting that these estimates are ceiling estimates, and the actual impacts would probably be smaller. One reason for that is not all school age children will attend school, and another reason is newly hired employees at the Project could potentially move themselves into Solano County but leave their school age children at their current schools and school districts.

MUNICIPAL SERVICES IMPACT

In order to better measure the impact that the Project will have on Solano County and Vallejo's municipal services, the Consulting Team looked at Yuba County, a county with a similar economic profile, and one that recently saw the introduction of its own casino-hotel. Yuba County is home to Hard Rock Casino Sacramento. Hard Rock Sacramento currently houses 1,400 Class III electronic gaming devices, 52 table games, five dining outlets, multiple bars, a nightclub, events center, and 169-key hotel. In addition, the property features a fueling station and convenience store.

The Hard Rock Casino Sacramento is 88 miles from the Project site and shares many characteristics as the Project. Both have large agricultural economies yet the majority of its residents are concentrated in urbanized areas. As a relatively new property, which opened in 2019, it is a modern facility incorporating the latest life safety features. While the Hard Rock Sacramento's casino is approximately half the size of the Project's gaming floor, it does feature a hotel, and a large concert venue. Given the similarities of these two counties, Yuba County became an ideal measure of the impact that a casino can have on a county's municipal services, in particular Police, Fire/EMS, and ambulance services.

The following key metrics were provided to the Consulting Team by Hard Rock Sacramento leadership.

- Yuba County Sheriff deputies were called by Hard Rock Sacramento and responded 302 times in 2023.
- The Local fire department was called by Hard Rock Sacramento and responded a total of 175 times in 2023, primarily for emergency medical services.

Using the aforementioned number of calls made by the Hard Rock Sacramento for police, fire and EMT services, the Consulting Team was able to use these statistics as a basis for forecasting expected call volume for the Project.

FORECASTED IMPACT ON POLICE

Police services for the Project will be provided by the City of Vallejo Police Department. The table below summarizes monthly staffing levels for the Police Patrol division.

2023 Vallejo Police Dept. Stats		
	Service Calls	Patrol Officers
January	4,065	51
February	3,580	51
March	4,181	43
April	4,218	43
May	4,485	41
June	4,609	40
July	4,662	44
August	5,001	41
September	4,616	46
October	4,486	46
November	4,068	48
December	3,942	47
Average	**4,326**	**45**
Total	**51,913**	

Source: Vallejo Police Department

On average, the Vallejo Police Department received 4,326 calls per month for service and a total of 51,913 in 2023 as further detailed in the table on the next page. The average number of patrol officers staffed is 45.

Using Hard Rock Sacramento as a comparable because of the highly similar demographics, APC estimates Hard Rock Sacramento achieves approximately 2.5 million in annual visitation, which translates to a Call for Service Incidence Rate of approximately 121 service calls to the police per million visitors. In the "Casino Market Study" chapter, APC forecasts the Project would achieve 5.5 million in annual visitors in Year 2 or 2029. Multiplying this visitation forecast with the same Call for Service Incidence Rate of 121 service calls per million visitors, APC arrived at 664 additional calls for service to the police annually because of the opening of the Project. Divided by the total call for service volume of 51,913 in 2013, this represents an increase in work volume of 1.28 percent.

According to the Vallejo Police Department Biennial Report, the total annual budget for fiscal year 2023 was $59,788,187, which covers all salaries & benefits, administration, support services, operations, investigations, and vehicle & equipment maintenance and replacement. Assuming the 1.28 percent increase in workload translates to the same increase in budget, multiplying the 2023 budget with 1.28 percent yields an estimated increase in budget of $765,000.

FORECASTED IMPACT ON DISTRICT ATTORNEY AND COURTS

All incidents that demand further prosecutorial or judicial actions fall under Solano County. APC obtained the following budgetary data for the Solano County District Attorney Office and Courts for fiscal year 2023-2024.

It is worth noting that this budget is for the entirety of Solano County, and based on the demographic review presented earlier, the city of Vallejo, where the Project is located, makes up 27.4 percent of the total population in Solano County. It is reasonable to assume the Solano County budget is proportionately spent across its cities based on population given the high congruency in demographics within the county. This assumption leads to multiplying the $69.2 million county budget by 27.4 percent to yield an estimated $18,959,436 budget on cases from the city of Vallejo for judicial offices.

Public Protection	
Judicial	
District Attorney	$ 37,359,521
Public Defender	$ 20,401,307
Alternate Public Defender	$ 6,700,356
Other Public Defense	$ 4,145,325
CMF Cases	$ 585,553
Total Judicial	**$ 69,192,062**
Sources: Solano County 2023/2024 Budget	

Assuming the 1.28 percent increase in police workload translates to the same increase in case volume and the workload of the judicial offices, multiplying the above $19.0 million with 1.28 percent yields an estimated increase in budget of $243,000.

FORECASTED IMPACT ON DETENTION & CORRECTION

All incidents that demand detention, correction and probation fall under Solano County. APC obtained the following budgetary data for Solano County Detention & Correction for fiscal year 2023-2024.

Again, this budget is for the entirety of Solano County, and based on the demographic review presented earlier, the city of Vallejo, where the Project is located, makes up 27.4 percent of the total population in Solano County. It is reasonable to assume the Solano County budget is proportionately spent across its cities based on population given the high congruency in demographics within the county. This assumption leads to multiplying the $57.2 million county budget by 27.4 percent to yield an estimated $15,679,500 budget on incidents from the city of Vallejo for detention and correction.

Public Protection		
Detention & Correction		
CA Jail Construction Fund	$	1,678
Courthouse Fund	$	326,735
Probation	$	56,700,547
Administration	$	192,042
Ward Welfare	$	1,000
Total Detention & Correction	**$**	**57,222,002**
Sources: Solano County 2023/2024 Budget		

Assuming the 1.28 percent increase in police workload translates to the same increase in case volume and the workload of the judicial offices, multiplying the above $15.7 million with 1.28 percent yields an estimated increase in budget of $201,000.

FORECASTED IMPACT ON FIRE AND EMERGENCY MEDICAL SERVICES

Fire and Emergency Medical Services (EMS) are expected to be provided by the City of Vallejo Fire Department. APC submitted a Public Records Request to the city of Vallejo for its 2023 Fire Department Annual Run Report, which recorded 18,061 total calls for service for 2023.

In the City of Vallejo – Fiscal Year 2023-2024 Proposed Budget released on May 15, 2023, the city of Vallejo Fire Department had a total of net expenditure of $25,924,552 for fiscal year 2022-2023 and proposed a net expenditure of $25,443,061 for fiscal year 2023-2024. Taking the average of these two net expenditure figures ($25,683,807) and dividing it by the number of total calls for service annually (18,061) from Vallejo Fire Department 2023 Annual report cited above yields a cost per call of $1,422.

APC interviewed the Fire Chief/Safety Officer, Mr. Randy York of the Olivehurst Public Utility District in May 2024. The Olivehurst Fire Department, under the Olivehurst Public Utility District, despite physically located in Yuba County, has been providing Fire and EMS services to Hard Rock Sacramento since October 2019. As sited earlier, the Olivehurst Public Utility District's fire department was called by Hard Rock Sacramento and responded a total of 175 times in 2023, primarily for emergency medical services.

Using Hard Rock Sacramento as a comparable because of the highly similar demographics, APC estimates Hard Rock Sacramento achieves approximately 2.5 million in annual visitation, which translates to a Call for Service Incidence Rate of 70 service calls to the fire department per million visitors. In the "Casino

Market Study" chapter, APC forecasts the Project would achieve 5.5 million in annual visitors in Year 2 or 2029. Multiplying this visitation forecast with the same Fire/EMS Call for Service Incidence Rate of 70 service calls per million visitors, APC arrives at 385 additional calls for service to the fire department annually because of the opening of the Project. Divided by the total call for service volume of 18,061 in 2023, this represents an increase in work volume of 2.1 percent.

Multiplying the cost of $1,422 per call with the forecasted 385 incremental calls for service due to the Project opening, APC estimates the additional budget needed for fire and EMS would be $547,500. The same forecasted number can also be arrived at by multiplying the 2.1 percent estimated increase in work volume with the average annual fire department budget of $25,683,807.

FORECASTED IMPACT ON PROPERTY TAX REVENUE

The Land into Trust process will ultimately remove the 128-acre site from county property tax rolls. To measure the possible impact that this would have, APC examined both the current property taxes paid for the Project Site and compared those to the Solano County's total property tax receipt.

The Project site is comprised of four contiguous land parcels. Total property taxes paid in 2023 is summarized below. For the 2023 tax year, the total property tax burden on the 128-acre land parcel that is the subject of this report was $86,948.

Project 2023 Property Taxes	
Parcel #	**Taxes Paid**
0182010010	$ 74,625
0182020020	$ 2,712
0182020080	$ 8,084
0182020010	$ 1,526
Total Property Taxes	**$ 86,948**
Source: Solano County County Clerk	

APC compiled the total property tax levies and collections of Solano County over three prior fiscal years. While 2023/2024 fiscal year total levies and collections are not yet available, it is safe to conclude that the $86,948 property tax due from the four contiguous land parcels for the Project that could be lost makes up approximately 0.01 percent of the total property tax levies for Solano County. This miniscule loss will certainly be recouped by other fees paid to the County as well as the overall growth in economic activity that the Project will generate.

Solano County Property Tax Levies & Collections		
Fiscal Year	**Levy**	**Collection**
2022	$ 729,153,536	$ 713,478,186
2021	$ 691,252,723	$ 683,709,592
2020	$ 660,005,045	$ 657,744,952
Source: Solano County County Clerk		

The table on the next page details the top fifty property tax payers in Solano County. In comparison, the estimated loss of property taxes by the transfer of the land parcel into Trust status is less than 16 percent of what the Shiloh Wind Project, LLC, the fiftieth highest tax payer, paid in property taxes.

Top 50 Property Taxpayers in Solano County for FY2023-24			
Principal/Property Tax Payer	**Parcels**	**Property Value**	**Total Taxes**
PACIFIC GAS & ELECTRIC CO	21	$ 979,919,069	$ 17,181,828
LERO REFINING COMPANY CALIF	28	$ 872,645,600	$ 10,409,070
GENENTECH INC	27	$ 801,390,817	$ 9,322,830
EUSER-BUSCH COMM STRAT LLC	2	$ 327,822,393	$ 3,760,498
STAR-WEST SOLANO LLC	7	$ 200,797,493	$ 2,308,700
INVITATION HOMES INC	423	$ 167,655,006	$ 2,155,320
PW FUND A LP	8	$ 178,307,910	$ 2,152,013
THE NIMITZ GROUP	102	$ 97,388,497	$ 2,151,578
ORTHBAY HEALTHCARE GROUP	12	$ 185,030,456	$ 2,091,657
ON OWNER POOL 1 SF N-B P LLC	28	$ 148,837,064	$ 1,777,737
CRAMENTO MUNICIPAL UTIL DIST	43	$ 144,891,667	$ 1,594,741
CPG FINANCE II LLC	3	$ 115,873,057	$ 1,541,605
FLANNERY ASSOCIATES LLC	197	$ 121,142,123	$ 1,515,536
COLONY STARWOOD HOMES	296	$ 118,138,118	$ 1,503,657
NT DUNHILL I LLC	8	$ 104,303,387	$ 1,387,900
PARK MANAGEMENT CORP	2	$ 92,996,270	$ 1,325,857
SHILOH IV WIND PROJECT LLC	1	$ 121,805,903	$ 1,309,292
GATEWAY 80 OWNER LP	4	$ 107,220,205	$ 1,308,214
SHILOH WIND PROJECT II LLC	1	$ 119,954,659	$ 1,289,393
PRIME ASCOT LP	282	$ 66,037,090	$ 1,275,511
SHILOH WIND PROJECT III LLC	1	$ 117,900,550	$ 1,267,313
NTRO WATT PROPERTY OWNER II	8	$ 89,768,544	$ 1,216,392
CORDELIA WINERY LLC	22	$ 98,685,509	$ 1,142,148
YER COOKWARE INDUSTRIES INC	7	$ 95,529,322	$ 1,139,380
APS WEST COAST INC	36	$ 95,603,521	$ 1,137,501
TRAVIS CREDIT UNION	10	$ 49,192,374	$ 1,135,289
AISER FOUNDATION HOSPITALS	5	$ 75,706,959	$ 1,097,576
NORTH POINTE APARTMENTS LLC	2	$ 92,135,197	$ 1,089,153
TRAVIS WAY LLC	1	$ 93,134,910	$ 1,083,747
RANGER NORTHBAY LLC	2	$ 90,270,000	$ 1,079,152
WRPV XIII BV VALLEJO LLC	2	$ 67,930,203	$ 994,898
ALZA CORPORATION	6	$ 81,571,879	$ 950,595
NETXERA ENERGY	1	$ 82,994,167	$ 892,104
RTH BAY LOGISTICS OWNER LLC	1	$ 74,970,000	$ 854,390
EQUOIA EQUITIES-RIVER OAKS	2	$ 62,167,547	$ 736,272
L-MART REAL ESTATE BUS TRUST	5	$ 62,642,313	$ 727,607
TE COMPENSATION INSRN FUND	4	$ 59,559,068	$ 726,644
JDM 111 2600 NAPA LLC	1	$ 67,488,901	$ 725,051
CDA COMM IMPROVMENT AUTH	1	$ 61,751,060	$ 719,982
N/A ROLLING OAKS-88 LP	1	$ 61,726,611	$ 719,961
RDAGH METAL BEVERAGE USA	1	$ 66,458,992	$ 700,989
AMDEN PARC RESIDENTIAL LLC	2	$ 59,170,141	$ 685,198
L METAL BEVERAGE CONT CORP	3	$ 64,313,105	$ 680,063
RTH VILLAGE DEVELOPMENT INC	2	$ 51,973,303	$ 675,177
WESTCORE CG SOLANO LLC	1	$ 52,211,549	$ 662,733
RTHBAY HEALTH ADVANTAGE LLC	2	$ 55,135,494	$ 638,478
FPA6 VILLAGE GREEN LLC	1	$ 54,295,919	$ 624,688
NN CROSSING APARTMENTS LLC	2	$ 51,037,205	$ 606,837
HE CLOROX INTERNATIONAL CO	3	$ 51,367,244	$ 550,208
SHILOH WIND PROJECT I LLC	1	$ 51,011,201	$ 548,319
Total		$ 7,209,859,572	$ 93,170,782

Source: County of Solano, 2023-24 Adopted Budget

SOCIAL IMPACTS ANALYSIS

PROBLEM GAMBLING

Today, casino gambling, whether tribal or commercial, is available in 48 states; sports wagering is available in 38 states, and seven states permit online casino gambling. Only Utah and Hawaii prohibit gambling.

The California Department of Public Health defines problem gambling as the uncontrollable urge to gamble despite negative consequences in a person's life.[2] Over the past thirty years, as legal casino gaming has expanded across the United States and around the globe, methodologies have evolved to identify problem gambling behavior, measure the degree of problem gambling within individuals, along with treatment methodologies.

IDENTIFYING PROBLEM GAMBLING BEHAVIOR

The most authoritative measures for problem gambling are found in the Diagnostic and Statistical Manual of Mental Disorders, and the South Oaks Gambling Screen (SOGS). These are measurement tools that mental health professionals use to identify and classify problem gambling behavior.

DSM-5TR

The *Diagnostic and Statistical Manual of Mental Disorders,* often known as the "DSM," is a reference book on mental health and brain-related conditions and disorders. The American Psychiatric Association is responsible for the writing, editing, reviewing and publishing of this book. It was first published in 1952.

Version 5 of this publication (DSM-5), last published in 2013, was updated in March of 2022 (DSM-5TR) and a chapter within it examines problem gambling behavior, and how to identify the behavior. It remains the most current tool to measure if an individual's behavior qualifies that person as a problem gambler.

DSM-5 established nine criteria for identifying problem gambling. A person who exhibits four or more of the following behaviors in a 12-month period is classified as a problem gambler.

1. Needs to gamble with increasing amounts of money in order to achieve the desired excitement.
2. Is restless or irritable when attempting to cut down or stop gambling.
3. Has made repeated unsuccessful efforts to control, cut back, or stop gambling.
4. Is often preoccupied with gambling (e.g., having persistent thoughts of reliving past gambling experiences, handicapping or planning the next venture, thinking of ways to get money with which to gamble).
5. Often gambles when feeling distressed (e.g., helpless, guilty, anxious, depressed).
6. After losing money gambling, often returns another day to get even ("chasing" one's losses).
7. Lies to conceal the extent of involvement with gambling.
8. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling.

[2] https://www.cdph.ca.gov/Programs/OPG/Pages/what-is-problem-gambling.aspx

9. Relies on others to provide money to relieve desperate financial situations.[3]

SOUTH OAKS GAMBLING SCREEN

The South Oaks Gambling Screen (SOGS) is a 20-item questionnaire based on DSM-III criteria for pathological gambling. This diagnostic tool correlates well with the criteria of those established in the DSM. It offers a convenient means to screen clinical populations of alcoholics and drug abusers, as well as general populations, for pathological gambling. SOGS is a more comprehensive survey that weighs various answers. It asks 16 basic questions along with an additional 21 sub-questions to not only determine if the respondent is a pathological gambler, but also the severity of that behavior.

Combined, SOGS and DSM-5TR are the authoritative tools to identify pathological gaming in individuals within a population.[4]

PREVALENCE OF PATHOLOGICAL GAMBLING IN CALIFORNIA

Estimates on the percent of adults who are classified as problem gamblers vary widely. The National Gambling Impact Study (NGIS), a seminal study conducted by the National Gambling Impact Commission and published in 1999, estimated that 1.3 percent to 1.6 percent of U.S. adults qualified as problem gamblers.[5] In a study entitled, "Prevalence of Problem Gambling: A Meta-analysis of Recent Empirical Research (2016-2022)"[6] the authors found a prevalence of moderate risk/at risk gambling to be 2.43 percent and of problem/pathological gambling to be 1.29 percent in the adult population.

The California Council on Problem Gambling, a non-profit organization that provides information on treatment options, and an affiliate of the National Council on Problem Gambling (NCPG) posts on its website that 3.7 percent of adults in California qualify as problem gamblers.[7] A closer look into the research that determined that figure reveals something less alarming:

> "In this report, respondents are classified as at-risk gamblers if they scored 1 or 2 on the lifetime NODS (DSM-5); as problem gamblers if they scored 3 or 4 on the lifetime NODS; and as pathological gamblers if they scored 5 or more on the lifetime NODS.
>
> Based on the NODS, the lifetime prevalence of pathological gambling in California is 1.5 percent and the lifetime prevalence of problem gambling is 2.2 percent. The prevalence of lifetime at-risk gambling in California is 9.5 percent. The overall lifetime prevalence rate of problem and pathological gambling in California (3.7 percent) is at the higher end of the range of prevalence rates identified using this screen in other states and nationally."[8]

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[3] https://portal.ct.gov/-/media/dmhas/pgs/dsmdiagnosispdf.pdf
[4] https://www.hca.wa.gov/assets/free-or-low-cost/south-oaks-gambling-screen-SOGS.pdf
[5] https://www.ojp.gov/ncjrs/virtual-library/abstracts/national-gambling-impact-study-commission-final-report
[6] https://pubmed.ncbi.nlm.nih.gov/36586057/
[7] https://calpg.org/
[8] https://cdn.calpg.org/ccpg/788995a344ed2bb7948531179eaeba37.pdf?updated_at=2022-12-04T19:22:17.812Z

The increased prevalence of problem gambling, as indicated by the two more recent studies cited above, can probably be attributed to the growth of casino gaming throughout the United States, and California in particular. In the late 1990s, casino gaming in California was in its infancy with only a handful of tribes offering bingo and gray market electronic gaming devices. The passage of the Indian Gaming Regulatory Act, followed by Proposition 1A led to a dramatic increase in both the number of tribal gaming facilities and quality of those properties. Nonetheless, given the disparity in estimates, it is difficult to pinpoint the actual incidence of problem and pathological gambling among the U.S. adult population. The authors of this study simply accept a range of 1.5 percent to 3.7 percent, with the lower percentage referring to those adults that can be classified as pathological gamblers and the higher percentage for those that exhibit some behaviors that would be considered problematic.

ASSESSING THE COSTS OF PROBLEM GAMBLING ON SOCIETY

Assessing the costs of problem gambling on society is challenging. There are costs that local and state governments bear in treating adults with problem gambling disorders; however, many of those costs are mitigated by the casino industry that contribute to Responsible Gaming (RG) initiatives. There are also the social costs borne by individuals and their families. Those personal costs may include financial hardship, personal bankruptcies, and failed relationships.

Then there are costs that are never realized. Just because 2 percent of adults living in California can be categorized as problem gamblers, that does not mean that they place any cost on society, or impact their lives and personal relationships. For many of these people who qualify as problem gamblers, they may not perceive their behavior as problematic. They enjoy gambling; they can afford to gamble, and are willing to spend a portion of their disposable income on gambling activities. Their gambling activity causes no harm and does not burden government with increased treatment costs. The authors of this study believe that the vast majority of gamblers, including those that qualify as problem gamblers, do not impose any additional costs on government or society because of their behavior.

COMORBIDITY

Any discussion of problem gambling must include the issue of co-morbidity. Comorbidity refers to the presence of more than one disease in a person. For the pathological gambler, this may include alcohol abuse, nicotine addiction, or substance abuse. In fact, the NGIS reported that pathological gambling often occurs in conjunction with other behavioral problems, including substance abuse, mood disorders and personality disorders. The NGIS further noted that mood disorders such as depression, suicidal thoughts, and anti-social hyperactivity often co-exist with pathological gambling.

Co-morbidity presents a wealth of challenges to the medical researcher. How does one isolate the effects of pathological gambling on say, marital stability from the effects of co-existing conditions like substance abuse? Is pathological gambling a bi-product of say, substance abuse? Is substance abuse a bi-product of problem gambling or is the combination of disorders caused by a more fundamental personality disorder? Is the severity of one disorder related to the other?[9]

PROBLEM GAMBLING AND CIGARETTE SMOKING

The start of the COVID-19 pandemic in March of 2020 ushered in a period when casinos across the country, both commercial and Tribal, initiated prohibitions on indoor cigarette smoking. Emergency declarations in the state of New Jersey and the Commonwealth of Pennsylvania imposed mask mandates and specifically prohibited smoking indoors from the time they re-opened in June of 2020 to June of 2021, when those mask mandates were lifted. Many Indian tribes also imposed similar mandates and chose to keep those smoking prohibitions in place even after the health crisis abated.

Shortly after the prohibition on indoor smoking in casinos in Atlantic City was lifted and smoking was once again permitted in New Jersey casinos in June of 2021, a grass roots movement by casino employees was initiated to permanently ban smoking in those casinos. In a likely response, the Casino Association of New Jersey engaged Spectrum Gaming Group to conduct a study that would analyze the potential effect that a possible smoking ban would have on the Atlantic City casino industry's gross gaming revenues and the resulting taxes paid to the State of New Jersey.[10]

In its effort to quantify the loss of gambling revenue when smokers took breaks, thus spending less time at table games or slot machines, the report unwittingly revealed a correlation between smoking and problem gambling. The report stated:

> "Some gamblers may have a fixed amount of time to play, which for a smoker could result in lower GGR for the casino due to the smoking breaks. It is also possible that the smoker during the first or second break would cut his or her losses and leave the casino…"[11]

In 2023, Richard Scheutz, a former member of the California Gambling Control Commission and a former casino executive, authored an article on smoking and problem gambling. In it, he noted:

> "When researchers explore the comorbidity between problem gambling and tobacco dependence, they find that the comorbid population is generally greater than 50 percent. Moreover, of those problem gamblers who smoke, it has been found that the severity of the gambling disorder is greater for the smoking group. In other words, what science tells us is that if you find a problem gambler, you will always want to take an even-money bet that this individual smokes. Moreover, if he or she does smoke, it is likely that the depth of their problem gambling issue is on the severe side.
>
> This is why the operators and lobbyists want to fight so hard to keep smoking in casinos. Sure, it damages the health of customers and employees, but it is one of the best

[9] https://govinfo.library.unt.edu/ngisc/reports/fullrpt.html.
[10] https://www.spectrumgaming.com/wp-content/uploads/2022/02/spectrum-report-for-canj-released-february-2022.pdf
[11] Spectrum Report, pp 31-32.

marketing tools available to access the problem gambler. And problem gamblers gamble a lot."[12]

It must be noted that while many Tribal casinos in Southern California have implemented permanent prohibitions on indoor smoking, including Pechanga Casino Resort and Yaamava' Casino Resort at San Manuel, all of the Class III casinos that serve the Sacramento region and the Bay Area are smoking facilities. The only property serving the region that is 100 percent smoke-free is the Class II San Pablo Casino.

One of the fundamental principles of responsible gambling is to encourage players to take periodic breaks. Of all the steps that a casino can take to mitigate problem gambling, the simplest and most benign act would be to implement a prohibition on indoor smoking. For a smoker, the physical urge to smoke a cigarette offers the player a periodic break, allowing that person to walk away from a table game or slot machine, and think about whether they have played enough. Unfortunately, the vast majority of California casino operators do not recognize smoking prohibitions as the simplest form of practicing responsible gaming. In fact, the California Council on Problem Gambling's website does not mention the correlation between smoking and problem gambling. The authors of this study also recognize that the vast majority of Tribal casinos ignore their duties of stewards of responsible gambling by continuing to allow indoor smoking.

CONCLUSION

The authors acknowledge that pathological gambling is a real problem that impacts individuals, families and communities. They also acknowledge that there are social costs that are borne by communities in the form of support and treatment costs. Many of these costs are supported by contributions by the California Tribal casino industry. Nevertheless, the vast majority of gamers, including those that can be identified as problem gamblers, do not place undue burdens on society. They may gamble more, but they can afford to do so and they enjoy doing so.

CRIME AND CASINOS

The United States General Accounting Office was asked to examine the June 1999 National Gambling Impact Study Commission (NGISC) findings on the economic and social effects of gambling on communities and families and explore the issues raised in the NGISC study through a case study in Atlantic City, NJ.[13] In its 2000 report, it noted:

> "We found no conclusive evidence on whether or not gambling caused increased social problems in Atlantic City. Data on family problems and suicide prior to 1978 (the year the casinos began operating in Atlantic City) were not readily available for all indicators. However, while we were not able to compare data for family problems before and after the casinos began operating, some family problems, including domestic violence incidents, child abuse, divorce, single-parent families, and suicide increased in some of

[12] https://sportshandle.com/schuetz-moral-cowardice-casino-smoking/
[13] https://www.gao.gov/assets/ggd-00-78.pdf

the years after casinos began operating and decreased in other years. Some crime rates, including total crime, property crime, embezzlement, and prostitution increased immediately after casinos began operating in Atlantic City. However, increases based on Atlantic City's adjusted population (adjusted to include visitors and nonresident workers) were less than increases based on the unadjusted population (Atlantic City's residents only)."[14]

CONCLUSION

Twenty-three years since the GAO report was issued, as casinos have expanded across California and the rest of the United States, little has changed. Casinos, like other large commercial developments including shopping malls, sports and entertainment complexes, big box retail developments, attract large volumes of people. Some of those people may have criminal intent, and increase the volume of criminal activity, but in community after community the rate of crime does not increase. Any community that accepts commercial development understands that the volume of visitors will increase. What does not increase is the rate at which criminal activity occurs, only the volume of activity.

[14] GAO Report, pp. 8-9.

FIRM OVERVIEW AND QUALIFICATIONS

Advantage Partners Consulting (APC) is a consulting firm specializing in market studies, feasibility studies, market research, strategy development, and gaming operation and products review for the gaming and hospitality industries. APC is also known for assisting business decision making through first-hand experience, research prowess, finance and analytical skills, and high-level algorithms including gravity models and artificial intelligence. APC's revenue forecast models have been called "the best in the industry" by multiple leaders in the business.

APC has assisted casino operators, tribal entities, real estate firms and investment firms in all types of operational, financial, and strategic consulting projects. APC also assisted multiple casino operators and developers through RFP processes and has helped native American tribes with opening, expansion, and other strategic projects.

Members of the APC team have conducted analyses for 200+ clients in 31+ states and 10+ countries in the gaming and hospitality industries. Both Lawrence Shen and Andrew Klebanow are intimately familiar with the tribal gaming market and similar greenfield casino development projects.

LAWRENCE S. SHEN, CFA

Lawrence Shen, CFA is the Managing Director at Advantage Partners Consulting (APC).

Before founding APC, Lawrence served as Director of Strategic Finance & Business Analysis at Caesars Entertainment where he was in charge of conducting market sizing of every new opportunity worldwide and forecasting negative impacts to every affected property due to new competitors or legislative changes. In that role, Lawrence also spearheaded multiple development projects and licensing bids in North America, Asia, and Europe with demand sizing, build optimization, site selection, and financial forecasts, including Caesars Entertainment's successful pursuit of the first gaming license issued in the State of Virginia.

Also in that role, Lawrence managed Caesars Entertainment's enterprise long-term revenue and cash flow model, which tracked the performance of 45+ properties nationwide on a weekly/monthly/quarterly basis. The model was used to perform scenario analyses for operating projections, acquisitions & divestitures, and capital structural changes at the requests of the C-Suite leadership and the Board of Directors. Lawrence worked closely with Caesars Entertainment Accounting, Treasury, and Investor Relations on quarterly earnings and cash flow alignment, EBITDA adjustments, cost savings calculations, rent and lease monitoring, and tracking of debt covenant ratios. In M&A, Lawrence participated in the sale of the Rio Hotel and Casino and the acquisition of Centaur Holdings. Lawrence also led the attempted acquisition of multiple VLT route operators in Illinois, and multiple casinos in Nevada, Louisiana, Rhode Island, and Pennsylvania.

Throughout his career, Lawrence developed over 50 state-of-the-art gravity models to forecast the gaming revenue of new entrants and competitive impacts to existing properties due to increased competitor or legislative changes, leading to gaming tax revenue forecast for multiple state regulatory agencies. These models also are used for decision making regarding the acquisition and divestiture of regional casinos. Clients included chain casino operators, Native American tribes, racetracks, hotel developers, lobbying groups, and prestigious private equity funds. Lawrence's gravity model series have been praised as "the best in the industry" by various leaders in the business.

Lawrence has worked on projects in 31 US states (Alabama, Arizona, Arkansas, California, Colorado, Delaware, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, Virginia, Washington, and West Virginia), as well as Canada, Greece, Japan, Singapore, South Korea, and the Caribbean. Lawrence serves as a guest lecturer at UNLV Lee Business School and has also appeared in courts as expert witness for gaming-related litigation in Florida, Colorado, New Jersey, and Illinois.

Lawrence holds the Chartered Financial Analyst (CFA) designation, a holy-grail designation that is highly respected in the financial and investment industries worldwide, and earned two Bachelor of Science degrees and a Master of Science degree from Duke University while pursuing a PhD degree in Physics.

ANDREW M. KLEBANOW

Andrew brings over 40 years' experience in the casino industry with the past twenty-three years spent as an independent consultant. Andrew specializes in property analysis, market research, marketing plan and business plan development, casino operations analysis, and service quality measurement for the gaming and hospitality industries. Andrew also leverages his experience and connections in the industry to assist in market studies, feasibilities studies, and facility planning recommendations.

Before becoming an independent consultant, Andrew held various leadership positions including Vice President of Marketing and General Manager for gaming companies like Sahara Gaming Corporation, Alliance Gaming Corporation, Santa Fe Gaming Corporation, and Boyd Gaming.

Since becoming an independent consultant in 2001, Andrew has completed 200+ assignments in jurisdictions throughout the United States as well as in eighteen foreign nations. He has worked on engagements for over 50 U.S. Indian Tribes. Over the course of his career, he has visited over 1,000 different casino properties in over 30 countries.

Andrew is a periodic lecturer at Cornell University's School of Hotel Administration and the University of Nevada Reno's School of Continuing Education. Mr. Klebanow has authored over 170 articles in Indian Gaming Magazine, Global Gaming Business, and CDC Gaming Reports. He has also contributed academic papers to the Cornell University Hotel and Restaurant Quarterly and the UNLV Hospitality Journal.

Over the past twenty years, Andrew has been a highly sought-after speaker and panelist at various gaming conventions including G2E Las Vegas, G2E Asia, Indian Gaming Association (IGA) conferences, Oklahoma Indian Gaming Association conferences, and the ASEAN Gaming Summit.

Andrew earned a Bachelor of Arts degree at New York University and a Master of Professional Studies degree in Marketing from Cornell University's School of Hotel Administration.

THEODORE (TEDDY) EBNER, MBA

Before joining APC, Teddy worked for 15 years in the finance industry and served as business strategy advisor for multiple companies in the technology and healthcare industries.

More recently, Teddy served as Chief Operating Officer for a company specializing in clinical trial operations over 10+ countries and chaperoned the company through sale to a prestigious private equity fund. Teddy also served as the business strategy advisor for a nationwide staffing agency that places 3,000 jobs and generates $40m in revenue annually.

Before then, Teddy served as VP of Operations for one of the largest regional retirement plan providers in the Carolinas and expanded business into states including Ohio, Maryland, and West Virginia before the sale of the company. Like Lawrence, Teddy is also versed in both financial analysis and data-centric analytical tasks, and has been a sought-after mobile app designer for a decade.

Teddy went to the University of North Carolina at Chapel Hill and holds a Bachelor of Science degree in Economics, and a Master of Business Administration degree.

TADAYUKI (TAD) HARA, PH.D

Dr. Tadayuki (Tad) Hara is a consulting partner at APC and focuses on Economic Impact Studies. He is Associate Professor & Senior Research Fellow at the Dick Pope Sr. Institute for Tourism Studies at the University of Central Florida (UCF) since 2005. Dr. Hara was also Associate Dean of the UCF Rosen College of Hospitality Management from 2008 to 2015.

Dr Hara has offered Massive Open Online Courses (MOOC) on tourism statistics and tourism satellite accounts to global participants since 2013, marking it as the first MOOC in the tourism and hospitality management field. His expertise focuses on Economic Impact Studies, Tourism Satellite Accounts, Culture Satellite Accounts, Aviation Satellite Accounts, Hospitality Finance, Casino Impact Studies, Indian Gaming, Tourism Taxation, and DMO Funding.

Outside academia, Dr. Hara has been on the Technical Advisory Board of the United Nations World Tourism Organization (UNWTO) since 2010 and a consultant for UNESCO Institute of Statistics since 2015. Before his career in academia, Dr. Hara spent 19 years working in global wholesale investment banking and foreign services. Dr. Hara holds a Doctor of Philosophy degree in Hotel Administration, a Master of Professional Studies degree in Hotel Management, and a Master of Science degree in Regional Science, all from Cornell University. Dr. Hara also holds a Master of Business Administration degree from University of South Wales.

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APPENDIX

CONSTRUCTION PHASE DETAILED ANALYSES

1-1. ALT-A: Construction - Output (Tribal Homes + Tribal Building + Casino)					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	$1,406,704,275	$1,300,431	$2,702,379	$1,410,707,085
2	7 - 44-45 - Retail Trade	$0	$61,810,498	$35,689,483	$97,499,981
3	11 - 53 - Real Estate and Rental and Leasing	$0	$22,817,691	$59,967,546	$82,785,237
4	16 - 62 - Health Care and Social Assistance	$0	$1,347	$41,121,756	$41,123,103
5	10 - 52 - Finance and Insurance	$0	$6,139,795	$19,745,493	$25,885,288
6	18 - 72 - Accommodation and Food Services	$0	$1,119,538	$22,976,116	$24,095,654
7	6 - 42 - Wholesale Trade	$0	$18,476,010	$5,580,936	$24,056,945
8	19 - 81 - Other Services (except Public Administration)	$0	$4,262,220	$16,127,877	$20,390,097
9	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$11,564,781	$7,453,598	$19,018,379
10	12 - 54 - Professional, Scientific, and Technical Services	$0	$12,680,043	$5,323,795	$18,003,838
11	5 - 31-33 - Manufacturing	$0	$14,020,941	$3,190,114	$17,211,055
12	8 - 48-49 - Transportation and Warehousing	$0	$6,684,092	$3,852,136	$10,536,228
13	9 - 51 - Information	$0	$1,899,154	$2,816,499	$4,715,653
14	3 - 22 - Utilities	$0	$1,750,714	$2,873,177	$4,623,891
15	20 - 9A - Government Enterprises	$0	$865,966	$3,351,055	$4,217,021
16	17 - 71 - Arts, Entertainment, and Recreation	$0	$118,440	$2,750,639	$2,869,080
17	15 - 61 - Educational Services	$0	$66,630	$2,353,917	$2,420,547
18	13 - 55 - Management of Companies and Enterprises	$0	$1,173,724	$593,722	$1,767,447
19	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$605,624	$36,503	$642,127
20	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$97,797	$198,719	$296,516
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$1,406,704,275**	**$167,455,436**	**$238,705,462**	**$1,812,865,173**

Source: APC

1-2. ALT-B: Construction - Output (only Casino)					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	$1,392,096,275	$1,286,926	$2,674,316	$1,396,057,518
2	7 - 44-45 - Retail Trade	$0	$61,168,623	$35,318,864	$96,487,487
3	11 - 53 - Real Estate and Rental and Leasing	$0	$22,580,740	$59,344,809	$81,925,549
4	16 - 62 - Health Care and Social Assistance	$0	$1,333	$40,694,725	$40,696,058
5	10 - 52 - Finance and Insurance	$0	$6,076,036	$19,540,445	$25,616,481
6	18 - 72 - Accommodation and Food Services	$0	$1,107,912	$22,737,520	$23,845,432
7	6 - 42 - Wholesale Trade	$0	$18,284,144	$5,522,980	$23,807,125
8	19 - 81 - Other Services (except Public Administration)	$0	$4,217,959	$15,960,396	$20,178,355
9	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$11,444,686	$7,376,196	$18,820,882
10	12 - 54 - Professional, Scientific, and Technical Services	$0	$12,548,366	$5,268,510	$17,816,876
11	5 - 31-33 - Manufacturing	$0	$13,875,339	$3,156,986	$17,032,326
12	8 - 48-49 - Transportation and Warehousing	$0	$6,614,681	$3,812,133	$10,426,814
13	9 - 51 - Information	$0	$1,879,432	$2,787,251	$4,666,683
14	3 - 22 - Utilities	$0	$1,732,533	$2,843,340	$4,575,873
15	20 - 9A - Government Enterprises	$0	$856,973	$3,316,256	$4,173,229
16	17 - 71 - Arts, Entertainment, and Recreation	$0	$117,210	$2,722,075	$2,839,285
17	15 - 61 - Educational Services	$0	$65,938	$2,329,472	$2,395,411
18	13 - 55 - Management of Companies and Enterprises	$0	$1,161,536	$587,557	$1,749,093
19	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$599,335	$36,124	$635,459
20	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$96,781	$196,656	$293,437
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$1,392,096,275**	**$165,716,485**	**$236,226,611**	**$1,794,039,372**

Source: APC

1-3. ALT-C: Construction - Output (NO Casino - only Tribal Homes, Tribal Holtels and Commecial Space)					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	$173,465,000	$160,360	$333,239	$173,958,599
2	7 - 44-45 - Retail Trade	$0	$7,622,041	$4,400,979	$12,023,020
3	11 - 53 - Real Estate and Rental and Leasing	$0	$2,813,719	$7,394,781	$10,208,500
4	16 - 62 - Health Care and Social Assistance	$0	$166	$5,070,849	$5,071,015
5	10 - 52 - Finance and Insurance	$0	$757,117	$2,434,877	$3,191,994
6	18 - 72 - Accommodation and Food Services	$0	$138,054	$2,833,255	$2,971,309
7	6 - 42 - Wholesale Trade	$0	$2,278,333	$688,202	$2,966,535
8	19 - 81 - Other Services (except Public Administration)	$0	$525,587	$1,988,778	$2,514,365
9	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$1,426,088	$919,126	$2,345,214
10	12 - 54 - Professional, Scientific, and Technical Services	$0	$1,563,615	$656,493	$2,220,108
11	5 - 31-33 - Manufacturing	$0	$1,728,965	$393,383	$2,122,348
12	8 - 48-49 - Transportation and Warehousing	$0	$824,236	$475,019	$1,299,254
13	9 - 51 - Information	$0	$234,191	$347,311	$581,502
14	3 - 22 - Utilities	$0	$215,886	$354,300	$570,186
15	20 - 9A - Government Enterprises	$0	$106,785	$413,229	$520,014
16	17 - 71 - Arts, Entertainment, and Recreation	$0	$14,605	$339,190	$353,795
17	15 - 61 - Educational Services	$0	$8,216	$290,269	$298,485
18	13 - 55 - Management of Companies and Enterprises	$0	$144,736	$73,214	$217,949
19	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$74,681	$4,501	$79,183
20	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$12,060	$24,505	$36,564
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$173,465,000**	**$20,649,441**	**$29,435,499**	**$223,549,941**

Source: APC

2-1. ALT-A Constuction Impact on Employment

	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	6,704	6	13	6,723
2	7 - 44-45 - Retail Trade	0	451	260	711
3	14 - 56 - Administrative and Support and Waste Management and Remediation Services	0	95	61	155
4	12 - 54 - Professional, Scientific, and Technical Services	0	71	30	100
5	8 - 48-49 - Transportation and Warehousing	0	61	35	97
6	19 - 81 - Other Services (except Public Administration)	0	49	184	233
7	6 - 42 - Wholesale Trade	0	43	13	55
8	11 - 53 - Real Estate and Rental and Leasing	0	36	96	132
9	10 - 52 - Finance and Insurance	0	21	67	88
10	5 - 31-33 - Manufacturing	0	15	3	18
11	18 - 72 - Accommodation and Food Services	0	11	227	238
12	13 - 55 - Management of Companies and Enterprises	0	5	3	8
13	9 - 51 - Information	0	3	5	9
14	20 - 9A - Government Enterprises	0	3	11	14
15	17 - 71 - Arts, Entertainment, and Recreation	0	2	42	43
16	3 - 22 - Utilities	0	1	2	3
17	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	0	1	0	1
18	15 - 61 - Educational Services	0	1	33	33
19	1 - 11 - Agriculture, Forestry, Fishing and Hunting	0	1	2	2
20	16 - 62 - Health Care and Social Assistance	0	0	315	315
21	21 - 93 - Non-NAICS	0	0	0	0
22	22 - 9B - Administrative Government	0	0	0	0
Total		**6,704**	**875**	**1,401**	**8,980**

Source: APC

2-2. ALT-B Constuction Impact on Employment					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	6,634	6	13	6,653
2	7 - 44-45 - Retail Trade	0	446	258	704
3	14 - 56 - Administrative and Support and Waste Management and Remediation Services	0	94	60	154
4	12 - 54 - Professional, Scientific, and Technical Services	0	70	29	99
5	8 - 48-49 - Transportation and Warehousing	0	61	35	96
6	19 - 81 - Other Services (except Public Administration)	0	48	182	230
7	6 - 42 - Wholesale Trade	0	42	13	55
8	11 - 53 - Real Estate and Rental and Leasing	0	36	95	131
9	10 - 52 - Finance and Insurance	0	21	66	87
10	5 - 31-33 - Manufacturing	0	15	3	18
11	18 - 72 - Accommodation and Food Services	0	11	225	236
12	13 - 55 - Management of Companies and Enterprises	0	5	3	8
13	9 - 51 - Information	0	3	5	8
14	20 - 9A - Government Enterprises	0	3	11	14
15	17 - 71 - Arts, Entertainment, and Recreation	0	2	41	43
16	3 - 22 - Utilities	0	1	2	3
17	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	0	1	0	1
18	15 - 61 - Educational Services	0	1	32	33
19	1 - 11 - Agriculture, Forestry, Fishing and Hunting	0	1	2	2
20	16 - 62 - Health Care and Social Assistance	0	0	312	312
21	21 - 93 - Non-NAICS	0	0	0	0
22	22 - 9B - Administrative Government	0	0	0	0
Total		**6,634**	**866**	**1,387**	**8,887**

Source: APC

2-3. ALT-C Constuction Impact on Employment					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	827	1	2	829
2	7 - 44-45 - Retail Trade	0	56	32	88
3	14 - 56 - Administrative and Support and Waste Management and Remediation Services	0	12	8	19
4	12 - 54 - Professional, Scientific, and Technical Services	0	9	4	12
5	8 - 48-49 - Transportation and Warehousing	0	8	4	12
6	19 - 81 - Other Services (except Public Administration)	0	6	23	29
7	6 - 42 - Wholesale Trade	0	5	2	7
8	11 - 53 - Real Estate and Rental and Leasing	0	4	12	16
9	10 - 52 - Finance and Insurance	0	3	8	11
10	5 - 31-33 - Manufacturing	0	2	0	2
11	18 - 72 - Accommodation and Food Services	0	1	28	29
12	13 - 55 - Management of Companies and Enterprises	0	1	0	1
13	9 - 51 - Information	0	0	1	1
14	20 - 9A - Government Enterprises	0	0	1	2
15	17 - 71 - Arts, Entertainment, and Recreation	0	0	5	5
16	3 - 22 - Utilities	0	0	0	0
17	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	0	0	0	0
18	15 - 61 - Educational Services	0	0	4	4
19	1 - 11 - Agriculture, Forestry, Fishing and Hunting	0	0	0	0
20	16 - 62 - Health Care and Social Assistance	0	0	39	39
21	21 - 93 - Non-NAICS	0	0	0	0
22	22 - 9B - Administrative Government	0	0	0	0
Total		**827**	**108**	**173**	**1,107**
Source: APC					

3-1. ALT-A Construction Impact on Compensation					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	$509,388,003	$470,905	$978,571	$510,837,478
2	7 - 44-45 - Retail Trade	$0	$16,739,283	$9,665,289	$26,404,572
3	16 - 62 - Health Care and Social Assistance	$0	$848	$25,896,243	$25,897,091
4	19 - 81 - Other Services (except Public Administration)	$0	$2,295,763	$8,686,971	$10,982,734
5	18 - 72 - Accommodation and Food Services	$0	$341,379	$7,006,079	$7,347,458
6	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$4,202,843	$2,708,768	$6,911,611
7	12 - 54 - Professional, Scientific, and Technical Services	$0	$4,217,560	$1,770,769	$5,988,328
8	6 - 42 - Wholesale Trade	$0	$3,945,799	$1,191,883	$5,137,683
9	10 - 52 - Finance and Insurance	$0	$1,049,960	$3,376,658	$4,426,618
10	8 - 48-49 - Transportation and Warehousing	$0	$1,793,879	$1,033,837	$2,827,716
11	11 - 53 - Real Estate and Rental and Leasing	$0	$719,512	$1,890,960	$2,610,472
12	5 - 31-33 - Manufacturing	$0	$1,358,373	$309,064	$1,667,437
13	20 - 9A - Government Enterprises	$0	$329,943	$1,276,790	$1,606,733
14	15 - 61 - Educational Services	$0	$36,163	$1,277,557	$1,313,719
15	13 - 55 - Management of Companies and Enterprises	$0	$595,589	$301,276	$896,865
16	3 - 22 - Utilities	$0	$314,781	$516,601	$831,382
17	17 - 71 - Arts, Entertainment, and Recreation	$0	$24,925	$578,843	$603,767
18	9 - 51 - Information	$0	$214,960	$318,791	$533,751
19	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$118,831	$7,162	$125,993
20	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$23,398	$47,544	$70,941
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$509,388,003**	**$38,794,692**	**$68,839,655**	**$617,022,349**
Source: APC					

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3-2. ALT-B Construction Impact on Compensation					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	$504,098,234	$466,015	$968,409	$505,532,658
2	7 - 44-45 - Retail Trade	$0	$16,565,453	$9,564,920	$26,130,372
3	16 - 62 - Health Care and Social Assistance	$0	$839	$25,627,322	$25,628,161
4	19 - 81 - Other Services (except Public Administration)	$0	$2,271,922	$8,596,760	$10,868,683
5	18 - 72 - Accommodation and Food Services	$0	$337,834	$6,933,324	$7,271,158
6	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$4,159,198	$2,680,638	$6,839,837
7	12 - 54 - Professional, Scientific, and Technical Services	$0	$4,173,762	$1,752,380	$5,926,142
8	6 - 42 - Wholesale Trade	$0	$3,904,824	$1,179,506	$5,084,330
9	10 - 52 - Finance and Insurance	$0	$1,039,057	$3,341,593	$4,380,650
10	8 - 48-49 - Transportation and Warehousing	$0	$1,775,250	$1,023,101	$2,798,351
11	11 - 53 - Real Estate and Rental and Leasing	$0	$712,040	$1,871,323	$2,583,363
12	5 - 31-33 - Manufacturing	$0	$1,344,267	$305,854	$1,650,121
13	20 - 9A - Government Enterprises	$0	$326,516	$1,263,531	$1,590,048
14	15 - 61 - Educational Services	$0	$35,787	$1,264,290	$1,300,077
15	13 - 55 - Management of Companies and Enterprises	$0	$589,404	$298,147	$887,552
16	3 - 22 - Utilities	$0	$311,512	$511,236	$822,748
17	17 - 71 - Arts, Entertainment, and Recreation	$0	$24,666	$572,832	$597,498
18	9 - 51 - Information	$0	$212,728	$315,481	$528,208
19	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$117,597	$7,088	$124,685
20	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$23,155	$47,050	$70,205
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$504,098,234**	**$38,391,826**	**$68,124,786**	**$610,614,846**
Source: APC					

3-3. ALT-C Construction Impact on Compensation					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	4 - 23 - Construction	$62,814,190	$58,069	$120,671	$62,992,929
2	7 - 44-45 - Retail Trade	$0	$2,064,172	$1,191,856	$3,256,028
3	16 - 62 - Health Care and Social Assistance	$0	$105	$3,193,345	$3,193,449
4	19 - 81 - Other Services (except Public Administration)	$0	$283,098	$1,071,217	$1,354,314
5	18 - 72 - Accommodation and Food Services	$0	$42,097	$863,941	$906,037
6	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$518,265	$334,026	$852,292
7	12 - 54 - Professional, Scientific, and Technical Services	$0	$520,080	$218,359	$738,439
8	6 - 42 - Wholesale Trade	$0	$486,569	$146,975	$633,543
9	10 - 52 - Finance and Insurance	$0	$129,474	$416,386	$545,860
10	8 - 48-49 - Transportation and Warehousing	$0	$221,209	$127,486	$348,694
11	11 - 53 - Real Estate and Rental and Leasing	$0	$88,725	$233,180	$321,905
12	5 - 31-33 - Manufacturing	$0	$167,505	$38,112	$205,617
13	20 - 9A - Government Enterprises	$0	$40,686	$157,445	$198,131
14	15 - 61 - Educational Services	$0	$4,459	$157,539	$161,999
15	13 - 55 - Management of Companies and Enterprises	$0	$73,444	$37,151	$110,595
16	3 - 22 - Utilities	$0	$38,817	$63,704	$102,520
17	17 - 71 - Arts, Entertainment, and Recreation	$0	$3,074	$71,379	$74,452
18	9 - 51 - Information	$0	$26,507	$39,311	$65,818
19	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$14,653	$883	$15,537
20	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$2,885	$5,863	$8,748
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$62,814,190**	**$4,783,892**	**$8,488,828**	**$76,086,910**
Source: APC					

Advantage Partners Consulting

4-1. ALT-A: Construction on Federal, State and County Taxes

		5001	6001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	
FEDERAL TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	**Total**
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$40,152,992	$5,861,986											**$46,014,978**
15015	Social Insurance Tax- Employer Contribution	$35,817,187												**$35,817,187**
15017	TOPI: Excise Taxes			$918,727										**$918,727**
15018	TOPI: Custom Duty			$1,023,516										**$1,023,516**
15026	OPI: Corporate Profits Tax													**$0**
15027	Personal Tax: Income Tax				($4,669)	($62,625)	($35,844)	$149,380	$1,156,262	$4,099,548	$11,681,829	$12,156,739	$43,621,429	**$72,762,050**
15028	Personal Tax: Estate and Gift Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
	Total	**$75,970,179**	**$5,861,986**	**$1,942,243**	**($4,669)**	**($62,625)**	**($35,844)**	**$149,380**	**$1,156,262**	**$4,099,548**	**$11,681,829**	**$12,156,739**	**$43,621,429**	**$156,536,457**

		5001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001	
STATE TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	**Total**
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$1,752,906												**$1,752,906**
15015	Social Insurance Tax- Employer Contribution	$1,797,937												**$1,797,937**
15020	TOPI: Sales Tax		$18,330,720											**$18,330,720**
15022	TOPI: Motor Vehicle License		$490,020											**$490,020**
15023	TOPI: Severance Tax		$42,443											**$42,443**
15024	TOPI: Other Taxes		$1,902,445											**$1,902,445**
15025	TOPI: Special Assessments		$0											**$0**
15026	OPI: Corporate Profits Tax												$14,139,132	**$14,139,132**
15027	Personal Tax: Income Tax			($1,916)	($1,846)	$43,361	$149,429	$665,727	$2,136,516	$5,210,518	$4,660,306	$12,589,009		**$25,451,104**
15030	Personal Tax: Motor Vehicle License			$863	$5,613	$9,687	$16,979	$46,665	$97,071	$142,550	$93,073	$114,906		**$527,407**
15031	Personal Tax: Property Taxes			$11	$137	$192	$345	$956	$1,616	$3,379	$3,553	$4,989		**$15,178**
15032	Personal Tax: Other Tax (Fish/Hunt)			$1	$383	$94	$179	$13,708	$6,006	$6,084	$14,830	$68,663		**$109,949**
	Total	**$3,550,843**	**$21,531,962**	**($1,041)**	**$4,288**	**$53,334**	**$166,932**	**$727,057**	**$2,241,209**	**$5,362,530**	**$4,771,762**	**$12,777,567**	**$14,139,132**	**$65,325,575**

		5001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001	
COUNTY TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	**Total**
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$0												**$0**
15015	Social Insurance Tax- Employer Contribution	$0												**$0**
15020	TOPI: Sales Tax		$105,468											**$105,468**
15022	TOPI: Motor Vehicle License		$0											**$0**
15023	TOPI: Severance Tax		$0											**$0**
15024	TOPI: Other Taxes		$465,541											**$465,541**
15025	TOPI: Special Assessments		$316,730											**$316,730**
15026	OPI: Corporate Profits Tax												$0	**$0**
15027	Personal Tax: Income Tax			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
15030	Personal Tax: Motor Vehicle License			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
15031	Personal Tax: Property Taxes			$83	$1,017	$1,424	$2,557	$7,078	$11,964	$25,018	$26,308	$36,940		**$112,388**
15032	Personal Tax: Other Tax (Fish/Hunt)			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
	Total	**$0**	**$6,562,314**	**$83**	**$1,017**	**$1,424**	**$2,557**	**$7,078**	**$11,964**	**$25,018**	**$26,308**	**$36,940**	**$0**	**$6,674,702**

Source: APC

4-2. ALT-B: Construction on Federal, State and County Taxes

FEDERAL TAX IMPACTS	Type Description Paying	5001 Employee Compensation	6001 Proprietor Income	8001 Tax on Production and Imports	10001 Households LT15k	10002 Households 15-30k	10003 Households 30-40k	10004 Households 40-50k	10005 Households 50-70k	10006 Households 70-100k	10007 Households 100-150k	10008 Households 150-200k	10009 Households GT200k	Total
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$39,736,021	$5,801,112											**$45,537,133**
15015	Social Insurance Tax- Employer Contribution	$35,445,241												**$35,445,241**
15017	TOPI: Excise Taxes			$909,186										**$909,186**
15018	TOPI: Custom Duty			$1,012,887										**$1,012,887**
15026	OPI: Corporate Profits Tax													**$13,994,549**
15027	Personal Tax: Income Tax				($4,620)	($61,975)	($35,471)	$147,829	$1,144,254	$4,056,976	$11,560,518	$12,030,497	$43,168,440	**$72,006,448**
15028	Personal Tax: Estate and Gift Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
	Total	**$75,181,262**	**$5,801,112**	**$1,922,074**	**($4,620)**	**($61,975)**	**($35,471)**	**$147,829**	**$1,144,254**	**$4,056,976**	**$11,560,518**	**$12,030,497**	**$43,168,440**	**$168,905,444**

STATE TAX IMPACTS	Type Description Paying	5001 Employee Compensation	8001 Proprietor Income	10001 Tax on Production and Imports	10002 Households LT15k	10003 Households 15-30k	10004 Households 30-40k	10005 Households 40-50k	10006 Households 50-70k	10007 Households 70-100k	10008 Households 100-150k	10009 Households 150-200k	13001 Households GT200k	Total
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$1,734,703												**$1,734,703**
15015	Social Insurance Tax- Employer Contribution	$1,779,266												**$1,779,266**
15020	TOPI: Sales Tax		$18,140,364											**$18,140,364**
15022	TOPI: Motor Vehicle License		$484,932											**$484,932**
15023	TOPI: Severance Tax		$42,003											**$42,003**
15024	TOPI: Other Taxes		$1,882,689											**$1,882,689**
15025	TOPI: Special Assessments		$0											**$0**
15026	OPI: Corporate Profits Tax												$13,992,303	**$13,992,303**
15027	Personal Tax: Income Tax			($1,896)	($1,826)	$42,910	$147,877	$658,814	$2,114,329	$5,156,409	$4,611,911	$12,458,278		**$25,186,806**
15030	Personal Tax: Motor Vehicle License			$854	$5,555	$9,587	$16,802	$46,180	$96,063	$141,070	$92,107	$113,712		**$521,930**
15031	Personal Tax: Property Taxes			$11	$136	$190	$342	$946	$1,599	$3,344	$3,516	$4,937		**$15,020**
15032	Personal Tax: Other Tax (Fish/Hunt)			$1	$379	$93	$178	$13,566	$5,944	$6,020	$14,676	$67,950		**$108,807**
	Total	**$3,513,969**	**$21,308,362**	**($1,030)**	**$4,244**	**$52,781**	**$165,199**	**$719,506**	**$2,217,935**	**$5,306,842**	**$4,722,209**	**$12,644,877**	**$13,992,303**	**$64,647,198**

COUNTY TAX IMPACTS	Type Description Paying	5001 Employee Compensation	8001 Proprietor Income	10001 Tax on Production and Imports	10002 Households LT15k	10003 Households 15-30k	10004 Households 30-40k	10005 Households 40-50k	10006 Households 50-70k	10007 Households 70-100k	10008 Households 100-150k	10009 Households 150-200k	13001 Households GT200k	Total
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$0												**$0**
15015	Social Insurance Tax- Employer Contribution	$0												**$0**
15020	TOPI: Sales Tax		$104,372											**$104,372**
15022	TOPI: Motor Vehicle License		$0											**$0**
15023	TOPI: Severance Tax		$0											**$0**
15024	TOPI: Other Taxes		$460,706											**$460,706**
15025	TOPI: Special Assessments		$313,441											**$313,441**
15026	OPI: Corporate Profits Tax												$0	**$0**
15027	Personal Tax: Income Tax			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
15030	Personal Tax: Motor Vehicle License			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
15031	Personal Tax: Property Taxes			$82	$1,006	$1,409	$2,530	$7,005	$11,839	$24,758	$26,035	$36,557		**$111,221**
15032	Personal Tax: Other Tax (Fish/Hunt)			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
	Total	**$0**	**$6,494,167**	**$82**	**$1,006**	**$1,409**	**$2,530**	**$7,005**	**$11,839**	**$24,758**	**$26,035**	**$36,557**	**$0**	**$6,605,389**

Source: APC

Advantage Partners Consulting

4-3. ALT-C: Construction on Federal, State and County Taxes

		5001	6001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	
FEDERAL TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Total
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$4,951,388	$722,859											**$5,674,247**
15015	Social Insurance Tax- Employer Contribution	$4,416,727												**$4,416,727**
15017	TOPI: Excise Taxes			$113,291										**$113,291**
15018	TOPI: Custom Duty			$126,213										**$126,213**
15026	OPI: Corporate Profits Tax													**$0**
15027	Personal Tax: Income Tax				($576)	($7,722)	($4,420)	$18,421	$142,582	$505,528	$1,440,522	$1,499,085	$5,379,092	**$8,972,511**
15028	Personal Tax: Estate and Gift Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
	Total	**$9,368,115**	**$722,859**	**$239,504**	**($576)**	**($7,722)**	**($4,420)**	**$18,421**	**$142,582**	**$505,528**	**$1,440,522**	**$1,499,085**	**$5,379,092**	**$19,302,989**

		5001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001	
STATE TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Total
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$216,156												**$216,156**
15015	Social Insurance Tax- Employer Contribution	$221,709												**$221,709**
15020	TOPI: Sales Tax		$2,260,417											**$2,260,417**
15022	TOPI: Motor Vehicle License		$60,426											**$60,426**
15023	TOPI: Severance Tax		$5,234											**$5,234**
15024	TOPI: Other Taxes		$234,596											**$234,596**
15025	TOPI: Special Assessments		$0											**$0**
15026	OPI: Corporate Profits Tax												$1,743,540	**$1,743,540**
15027	Personal Tax: Income Tax			($236)	($228)	$5,347	$18,427	$82,093	$263,460	$642,525	$574,677	$1,552,389		**$3,138,453**
15030	Personal Tax: Motor Vehicle License			$106	$692	$1,195	$2,094	$5,754	$11,970	$17,578	$11,477	$14,169		**$65,036**
15031	Personal Tax: Property Taxes			$1	$17	$24	$43	$118	$199	$417	$438	$615		**$1,872**
15032	Personal Tax: Other Tax (Fish/Hunt)			$0	$47	$12	$22	$1,690	$741	$750	$1,829	$8,467		**$13,558**
	Total	**$437,865**	**$2,655,172**	**($128)**	**$529**	**$6,577**	**$20,585**	**$89,656**	**$276,370**	**$661,270**	**$588,421**	**$1,575,641**	**$1,743,540**	**$8,055,496**

		5001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001	
COUNTY TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Total
Transfer Code	Description													
15014	Social Insurance Tax- Employee Contribution	$0												**$0**
15015	Social Insurance Tax- Employer Contribution	$0												**$0**
15020	TOPI: Sales Tax		$13,006											**$13,006**
15022	TOPI: Motor Vehicle License		$0											**$0**
15023	TOPI: Severance Tax		$0											**$0**
15024	TOPI: Other Taxes		$57,407											**$57,407**
15025	TOPI: Special Assessments		$39,057											**$39,057**
15026	OPI: Corporate Profits Tax												$0	**$0**
15027	Personal Tax: Income Tax			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
15030	Personal Tax: Motor Vehicle License			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
15031	Personal Tax: Property Taxes			$10	$125	$176	$315	$873	$1,475	$3,085	$3,244	$4,555		**$13,859**
15032	Personal Tax: Other Tax (Fish/Hunt)			$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
	Total	**$0**	**$809,219**	**$10**	**$125**	**$176**	**$315**	**$873**	**$1,475**	**$3,085**	**$3,244**	**$4,555**	**$0**	**$823,078**

Source: APC

	5. ALT-A&B Operation Impact - Output				
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	17 - 71 - Arts, Entertainment, and Recreation	$936,500,000	$42,403,895	$1,247,680	$980,151,575
2	11 - 53 - Real Estate and Rental and Leasing	$0	$76,211,487	$27,201,017	$103,412,504
3	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$36,562,943	$3,380,778	$39,943,722
4	12 - 54 - Professional, Scientific, and Technical Services	$0	$29,444,424	$2,414,518	$31,858,942
5	10 - 52 - Finance and Insurance	$0	$15,336,409	$8,954,081	$24,290,490
6	7 - 44-45 - Retail Trade	$0	$3,337,579	$16,188,977	$19,526,556
7	16 - 62 - Health Care and Social Assistance	$0	$280,470	$18,653,846	$18,934,316
8	18 - 72 - Accommodation and Food Services	$0	$7,201,180	$10,419,165	$17,620,346
9	19 - 81 - Other Services (except Public Administration)	$0	$5,977,757	$7,314,127	$13,291,885
10	8 - 48-49 - Transportation and Warehousing	$0	$8,180,393	$1,746,825	$9,927,218
11	20 - 9A - Government Enterprises	$0	$7,665,687	$1,520,236	$9,185,923
12	15 - 61 - Educational Services	$0	$5,943,092	$1,066,520	$7,009,612
13	9 - 51 - Information	$0	$4,659,218	$1,277,676	$5,936,894
14	4 - 23 - Construction	$0	$4,665,505	$1,225,788	$5,891,293
15	6 - 42 - Wholesale Trade	$0	$3,164,505	$2,531,699	$5,696,203
16	3 - 22 - Utilities	$0	$3,475,402	$1,303,507	$4,778,909
17	5 - 31-33 - Manufacturing	$0	$2,041,600	$1,447,141	$3,488,741
18	13 - 55 - Management of Companies and Enterprises	$0	$2,666,043	$269,281	$2,935,324
19	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$361,137	$90,148	$451,285
20	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$101,891	$16,559	$118,450
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$936,500,000**	**$259,680,618**	**$108,269,569**	**$1,304,450,187**
Source: APC					

6. ALT-A&B Operation Impact on Employment					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	17 - 71 - Arts, Entertainment, and Recreation	3,640	643	19	4,302
2	14 - 56 - Administrative and Support and Waste Management and Remediation Services	0	299	28	327
3	12 - 54 - Professional, Scientific, and Technical Services	0	164	13	177
4	11 - 53 - Real Estate and Rental and Leasing	0	122	43	165
5	15 - 61 - Educational Services	0	82	15	97
6	8 - 48-49 - Transportation and Warehousing	0	75	16	91
7	18 - 72 - Accommodation and Food Services	0	71	103	174
8	19 - 81 - Other Services (except Public Administration)	0	68	84	152
9	10 - 52 - Finance and Insurance	0	52	30	82
10	20 - 9A - Government Enterprises	0	25	5	30
11	7 - 44-45 - Retail Trade	0	24	118	142
12	4 - 23 - Construction	0	22	6	28
13	13 - 55 - Management of Companies and Enterprises	0	12	1	13
14	9 - 51 - Information	0	8	2	11
15	6 - 42 - Wholesale Trade	0	7	6	13
16	1 - 11 - Agriculture, Forestry, Fishing and Hunting	0	3	1	3
17	3 - 22 - Utilities	0	3	1	4
18	16 - 62 - Health Care and Social Assistance	0	2	143	145
19	5 - 31-33 - Manufacturing	0	2	2	4
20	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	0	0	0	0
21	22 - 9B - Administrative Government	0	0	0	0
22	21 - 93 - Non-NAICS	0	0	0	0
Total		**3,640**	**1,685**	**636**	**5,960**
Source: APC					

7. ALT-A&B Operation Impact on Compensation					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	17 - 71 - Arts, Entertainment, and Recreation	$197,076,519	$8,923,451	$262,561	$206,262,531
2	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$13,287,611	$1,228,634	$14,516,245
3	16 - 62 - Health Care and Social Assistance	$0	$176,625	$11,747,176	$11,923,801
4	12 - 54 - Professional, Scientific, and Technical Services	$0	$9,793,627	$803,103	$10,596,730
5	19 - 81 - Other Services (except Public Administration)	$0	$3,219,804	$3,939,614	$7,159,418
6	18 - 72 - Accommodation and Food Services	$0	$2,195,847	$3,177,103	$5,372,950
7	7 - 44-45 - Retail Trade	$0	$903,870	$4,384,237	$5,288,107
8	10 - 52 - Finance and Insurance	$0	$2,622,664	$1,531,229	$4,153,893
9	15 - 61 - Educational Services	$0	$3,225,534	$578,839	$3,804,373
10	20 - 9A - Government Enterprises	$0	$2,920,713	$579,227	$3,499,940
11	11 - 53 - Real Estate and Rental and Leasing	$0	$2,403,181	$857,731	$3,260,913
12	8 - 48-49 - Transportation and Warehousing	$0	$2,195,456	$468,813	$2,664,270
13	4 - 23 - Construction	$0	$1,689,447	$443,875	$2,133,322
14	13 - 55 - Management of Companies and Enterprises	$0	$1,352,845	$136,643	$1,489,488
15	6 - 42 - Wholesale Trade	$0	$675,822	$540,678	$1,216,500
16	3 - 22 - Utilities	$0	$624,882	$234,372	$859,254
17	9 - 51 - Information	$0	$527,363	$144,617	$671,980
18	5 - 31-33 - Manufacturing	$0	$197,794	$140,202	$337,995
19	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$86,402	$21,568	$107,970
20	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$19,992	$3,249	$23,241
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$197,076,519**	**$57,042,932**	**$31,223,471**	**$285,342,922**
Source: APC					

8. ALT-A&B: Operation Impacts on Federal, State and County Taxes

FEDERAL TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Enterprises (Corporations)	Total
		5001	6001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001	
Transfer Code	Description														
15014	Social Insurance Tax- Employee Contribution	$18,337,938	$2,583,095												**$20,921,034**
15015	Social Insurance Tax- Employer Contribution	$16,357,769													**$16,357,769**
15017	TOPI: Excise Taxes			$1,147,811											**$1,147,811**
15018	TOPI: Custom Duty			$1,278,729											**$1,278,729**
15026	OPI: Corporate Profits Tax													$6,772,626	**$6,772,626**
15027	Personal Tax: Income Tax				($2,127)	($28,461)	($16,296)	$67,926	$525,475	$1,862,273	$5,305,010	$5,514,084	$19,699,743		**$32,927,626**
15028	Personal Tax: Estate and Gift Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
		$34,695,707	**$2,583,095**	**$2,426,540**	**($2,127)**	**($28,461)**	**($16,296)**	**$67,926**	**$525,475**	**$1,862,273**	**$5,305,010**	**$5,514,084**	**$19,699,743**	**$6,772,626**	**$79,405,595**

STATE TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Enterprises (Corporations)	Total
		5001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001		
Transfer Code	Description														
15014	Social Insurance Tax- Employee Contribution	$800,555													**$800,555**
15015	Social Insurance Tax- Employer Contribution	$821,121													**$821,121**
15020	TOPI: Sales Tax		$22,901,478												**$22,901,478**
15022	TOPI: Motor Vehicle License		$612,207												**$612,207**
15023	TOPI: Severance Tax		$53,026												**$53,026**
15024	TOPI: Other Taxes		$2,376,819												**$2,376,819**
15025	TOPI: Special Assessments		$0												**$0**
15026	OPI: Corporate Profits Tax												$6,771,539		**$6,771,539**
15027	Personal Tax: Income Tax			($873)	($839)	$19,714	$67,948	$302,547	$970,540	$2,366,226	$2,113,833	$5,685,285			**$11,524,381**
15030	Personal Tax: Motor Vehicle License			$393	$2,551	$4,404	$7,720	$21,207	$44,096	$64,736	$42,217	$51,892			**$239,216**
15031	Personal Tax: Property Taxes			$5	$62	$87	$157	$434	$734	$1,534	$1,611	$2,253			**$6,879**
15032	Personal Tax: Other Tax (Fish/Hunt)			$0	$174	$43	$82	$6,230	$2,728	$2,763	$6,727	$31,009			**$49,755**
		$1,621,676	**$25,943,530**	**($474)**	**$1,949**	**$24,248**	**$75,907**	**$330,418**	**$1,018,098**	**$2,435,259**	**$2,164,388**	**$5,770,439**	**$6,771,539**	**$0**	**$46,156,976**

COUNTY TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Enterprises (Corporations)	Total
		5001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001		
Transfer Code	Description														
15014	Social Insurance Tax- Employee Contribution	$0													**$0**
15015	Social Insurance Tax- Employer Contribution	$0													**$0**
15020	TOPI: Sales Tax		$131,766												**$131,766**
15022	TOPI: Motor Vehicle License		$0												**$0**
15023	TOPI: Severance Tax		$0												**$0**
15024	TOPI: Other Taxes		$581,623												**$581,623**
15025	TOPI: Special Assessments		$395,707												**$395,707**
15026	OPI: Corporate Profits Tax												$0		**$0**
15027	Personal Tax: Income Tax			$0	$0	$0	$0	$0	$0	$0	$0	$0			**$0**
15030	Personal Tax: Motor Vehicle License			$0	$0	$0	$0	$0	$0	$0	$0	$0			**$0**
15031	Personal Tax: Property Taxes			$38	$462	$647	$1,163	$3,217	$5,435	$11,361	$11,933	$16,682			**$50,938**
15032	Personal Tax: Other Tax (Fish/Hunt)			$0	$0	$0	$0	$0	$0	$0	$0	$0			**$0**
		$0	**$8,198,624**	**$38**	**$462**	**$647**	**$1,163**	**$3,217**	**$5,435**	**$11,361**	**$11,933**	**$16,682**	**$0**	**$8,249,562**	**$16,499,124**

Source: APC

Advantage Partners Consulting

	9. ALT-C Operation Output				
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	17 - 71 - Arts, Entertainment, and Recreation	$87,000,000	$3,939,283	$115,908	$91,055,192
2	11 - 53 - Real Estate and Rental and Leasing	$0	$7,079,978	$2,526,950	$9,606,928
3	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$3,396,664	$314,071	$3,710,735
4	12 - 54 - Professional, Scientific, and Technical Services	$0	$2,735,360	$224,307	$2,959,667
5	10 - 52 - Finance and Insurance	$0	$1,424,738	$831,826	$2,256,564
6	7 - 44-45 - Retail Trade	$0	$310,058	$1,503,941	$1,813,999
7	16 - 62 - Health Care and Social Assistance	$0	$26,055	$1,732,925	$1,758,981
8	18 - 72 - Accommodation and Food Services	$0	$668,983	$967,931	$1,636,914
9	19 - 81 - Other Services (except Public Administration)	$0	$555,328	$679,476	$1,234,804
10	8 - 48-49 - Transportation and Warehousing	$0	$759,951	$162,278	$922,230
11	20 - 9A - Government Enterprises	$0	$712,135	$141,229	$853,364
12	15 - 61 - Educational Services	$0	$552,108	$99,079	$651,187
13	9 - 51 - Information	$0	$432,837	$118,695	$551,532
14	4 - 23 - Construction	$0	$433,421	$113,875	$547,296
15	6 - 42 - Wholesale Trade	$0	$293,980	$235,193	$529,172
16	3 - 22 - Utilities	$0	$322,862	$121,095	$443,956
17	5 - 31-33 - Manufacturing	$0	$189,663	$134,438	$324,101
18	13 - 55 - Management of Companies and Enterprises	$0	$247,673	$25,016	$272,689
19	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$33,549	$8,375	$41,924
20	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$9,466	$1,538	$11,004
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$87,000,000**	**$24,124,094**	**$10,058,145**	**$121,182,238**

Source: APC

10. ALT-C Operation Impact on Employment

	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	17 - 71 - Arts, Entertainment, and Recreation	527	60	2	589
2	14 - 56 - Administrative and Support and Waste Management and Remediation Services	0	28	3	30
3	12 - 54 - Professional, Scientific, and Technical Services	0	15	1	16
4	11 - 53 - Real Estate and Rental and Leasing	0	11	4	15
5	15 - 61 - Educational Services	0	8	1	9
6	8 - 48-49 - Transportation and Warehousing	0	7	1	8
7	18 - 72 - Accommodation and Food Services	0	7	10	16
8	19 - 81 - Other Services (except Public Administration)	0	6	8	14
9	10 - 52 - Finance and Insurance	0	5	3	8
10	20 - 9A - Government Enterprises	0	2	0	3
11	7 - 44-45 - Retail Trade	0	2	11	13
12	4 - 23 - Construction	0	2	1	3
13	13 - 55 - Management of Companies and Enterprises	0	1	0	1
14	9 - 51 - Information	0	1	0	1
15	6 - 42 - Wholesale Trade	0	1	1	1
16	1 - 11 - Agriculture, Forestry, Fishing and Hunting	0	0	0	0
17	3 - 22 - Utilities	0	0	0	0
18	16 - 62 - Health Care and Social Assistance	0	0	13	13
19	5 - 31-33 - Manufacturing	0	0	0	0
20	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	0	0	0	0
21	22 - 9B - Administrative Government	0	0	0	0
22	21 - 93 - Non-NAICS	0	0	0	0
Total		**527**	**157**	**59**	**743**

Source: APC

11. ALT-C Operation Imapct on Compensation					
	Industry Display	1 - Direct	2 - Indirect	3 - Induced	Total
1	17 - 71 - Arts, Entertainment, and Recreation	$18,308,230	$828,981	$24,392	$19,161,602
2	14 - 56 - Administrative and Support and Waste Management and Remediation Services	$0	$1,234,407	$114,139	$1,348,546
3	16 - 62 - Health Care and Social Assistance	$0	$16,408	$1,091,302	$1,107,710
4	12 - 54 - Professional, Scientific, and Technical Services	$0	$909,819	$74,608	$984,427
5	19 - 81 - Other Services (except Public Administration)	$0	$299,117	$365,987	$665,103
6	18 - 72 - Accommodation and Food Services	$0	$203,992	$295,150	$499,142
7	7 - 44-45 - Retail Trade	$0	$83,969	$407,292	$491,260
8	10 - 52 - Finance and Insurance	$0	$243,643	$142,250	$385,893
9	15 - 61 - Educational Services	$0	$299,649	$53,774	$353,423
10	20 - 9A - Government Enterprises	$0	$271,332	$53,810	$325,141
11	11 - 53 - Real Estate and Rental and Leasing	$0	$223,253	$79,682	$302,936
12	8 - 48-49 - Transportation and Warehousing	$0	$203,956	$43,552	$247,508
13	4 - 23 - Construction	$0	$156,948	$41,236	$198,184
14	13 - 55 - Management of Companies and Enterprises	$0	$125,678	$12,694	$138,372
15	6 - 42 - Wholesale Trade	$0	$62,783	$50,229	$113,012
16	3 - 22 - Utilities	$0	$58,051	$21,773	$79,824
17	9 - 51 - Information	$0	$48,992	$13,435	$62,426
18	5 - 31-33 - Manufacturing	$0	$18,375	$13,025	$31,399
19	1 - 11 - Agriculture, Forestry, Fishing and Hunting	$0	$8,027	$2,004	$10,030
20	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction	$0	$1,857	$302	$2,159
21	21 - 93 - Non-NAICS	$0	$0	$0	$0
22	22 - 9B - Administrative Government	$0	$0	$0	$0
Total		**$18,308,230**	**$5,299,237**	**$2,900,632**	**$26,508,098**
Source: APC					

12. ALT-C: Operation Impact on Federal, State and County Taxes

		5001	6001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001	
FEDERAL TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Enterprises (Corporations)	**Total**
Transfer Code	Description														
15014	Social Insurance Tax- Employee Contribution	$1,703,578	$239,967												**$1,943,545**
15015	Social Insurance Tax- Employer Contribution	$1,519,622													**$1,519,622**
15017	TOPI: Excise Taxes			$106,631											**$106,631**
15018	TOPI: Custom Duty			$118,793											**$118,793**
15026	OPI: Corporate Profits Tax													$629,171	**$629,171**
15027	Personal Tax: Income Tax				($198)	($2,644)	($1,514)	$6,310	$48,816	$173,003	$492,831	$512,253	$1,830,088		**$3,058,947**
15028	Personal Tax: Estate and Gift Tax				$0	$0	$0	$0	$0	$0	$0	$0	$0		**$0**
	Total	**$3,223,200**	**$239,967**	**$225,423**	**($198)**	**($2,644)**	**($1,514)**	**$6,310**	**$48,816**	**$173,003**	**$492,831**	**$512,253**	**$1,830,088**	**$629,171**	**$7,376,708**

		5001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001		
STATE TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Enterprises (Corporations)	**Total**
Transfer Code	Description														
15014	Social Insurance Tax- Employee Contribution	$74,371													**$74,371**
15015	Social Insurance Tax- Employer Contribution	$76,281													**$76,281**
15020	TOPI: Sales Tax		$2,127,526												**$2,127,526**
15022	TOPI: Motor Vehicle License		$56,873												**$56,873**
15023	TOPI: Severance Tax		$4,926												**$4,926**
15024	TOPI: Other Taxes		$220,804												**$220,804**
15025	TOPI: Special Assessments		$0												**$0**
15026	OPI: Corporate Profits Tax												$629,070		**$629,070**
15027	Personal Tax: Income Tax			($81)	($78)	$1,831	$6,312	$28,106	$90,162	$219,820	$196,373	$528,158			**$1,070,605**
15030	Personal Tax: Motor Vehicle License			$37	$237	$409	$717	$1,970	$4,096	$6,014	$3,922	$4,821			**$22,223**
15031	Personal Tax: Property Taxes			$0	$6	$8	$15	$40	$68	$143	$150	$209			**$639**
15032	Personal Tax: Other Tax (Fish/Hunt)			$0	$16	$4	$8	$579	$253	$257	$625	$2,881			**$4,622**
	Total	**$150,652**	**$2,499,074**	**($44)**	**$181**	**$2,253**	**$7,052**	**$30,696**	**$94,580**	**$226,233**	**$201,070**	**$536,069**	**$629,070**		**$4,287,941**

		5001	8001	10001	10002	10003	10004	10005	10006	10007	10008	10009	13001		
COUNTY TAX IMPACTS	Type Description Paying	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households LT15k	Households 15-30k	Households 30-40k	Households 40-50k	Households 50-70k	Households 70-100k	Households 100-150k	Households 150-200k	Households GT200k	Enterprises (Corporations)	**Total**
Transfer Code	Description														
15014	Social Insurance Tax- Employee Contribution	$0													**$0**
15015	Social Insurance Tax- Employer Contribution	$0													**$0**
15020	TOPI: Sales Tax		$12,241												**$12,241**
15022	TOPI: Motor Vehicle License		$0												**$0**
15023	TOPI: Severance Tax		$0												**$0**
15024	TOPI: Other Taxes		$54,032												**$54,032**
15025	TOPI: Special Assessments		$36,761												**$36,761**
15026	OPI: Corporate Profits Tax												$0		**$0**
15027	Personal Tax: Income Tax			$0	$0	$0	$0	$0	$0	$0	$0	$0			**$0**
15030	Personal Tax: Motor Vehicle License			$0	$0	$0	$0	$0	$0	$0	$0	$0			**$0**
15031	Personal Tax: Property Taxes			$3	$43	$60	$108	$299	$505	$1,055	$1,109	$1,550			**$4,732**
15032	Personal Tax: Other Tax (Fish/Hunt)			$0	$0	$0	$0	$0	$0	$0	$0	$0			**$0**
	Total	**$0**	**$761,645**	**$3**	**$43**	**$60**	**$108**	**$299**	**$505**	**$1,055**	**$1,109**	**$1,550**	**$0**		**$107,766**

Source: APC

Appendix B

Water and Wastewater Feasibility Study

Acorn Environmental – Scotts Valley Rancheria

Water and Wastewater Feasibility Study

Prepared by HydroScience Engineers, Inc.

July 2024

HydroScience

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

AF	acre-feet
AFY	acre-feet per year
bgs	below ground surface
BOD	biochemical oxygen demand
City	City of Vallejo
CFR	Code of Federal Regulations
CT	product of chlorine residual and modal contact time measured at the same
District	Vallejo Flood and Wastewater District
DU	dwelling unit
DWR	Department of Water Resources
ET	evapotranspiration rate
Ft	feet
Ft^2	square feet
gal	gallons
gpd	gallons per day
gpm	gallons per minute
LS	lump sum
MBR	membrane bioreactor
MCL	Maximum Contaminant Level
MG	million gallons
mg/L	milligrams per liter
µg/L	micrograms per liter
MGD	million gallons per day
MPN	Most Probable Number
NPDES	National Pollution Discharge Elimination System
NTU	nephelometric turbidity units
PLC	programmable logic controller
RWFP	Recycled Water Facilities Plan
RWQCB	Regional Water Quality Control Board
SWRCB	State Water Resources Control Board
SDS	Safety Data Sheets
sf	square feet
TSS	total suspended solids
UV	Ultraviolet
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VFWD	Vallejo Flood and Wastewater District
WWTP	Wastewater Treatment Plant

SECTION 1 – INTRODUCTION

HydroScience Engineers, Inc. (HydroScience) was retained by Acorn Environmental to prepare a feasibility study evaluating the regulatory, technical, and engineering issues associated with supplying water and handling wastewater from the Scotts Valley Casino (Project) proposed by the Scotts Valley Band of Pomo Indians (Tribe) of Northern California. The objectives of this water and wastewater feasibility study are to:

- Estimate the proposed Project's water supply and wastewater disposal requirements;
- Describe the facilities that would be necessary to supply the required water, treat the required wastewater, and identify possible connections to existing public infrastructure;
- Develop a strategy for disposing of wastewater generated by the Project; and
- Identify applicable water and wastewater permitting issues for the proposed Project.

This report evaluates these objectives for three Project alternatives located at the project site:

- Alternative A – Proposed Project consists of tribal housing and an administrative building, casino, with event/multipurpose space, restaurants, parking structure, and surface parking lots.
- Alternative B – Reduced Intensity Project plan consists of Alternative A casino without tribal housing and the administrative building.
- Alternative C – Non-Gaming Project is the third development alternative (non-gaming) which consists of hotels, commercial buildings, tribal housing and tribal administrative buildings.

This document describes each alternative's water supply and wastewater requirements, identifies projected flows and demands, and evaluates alternative effluent disposal strategies.

SECTION 4 and **SECTION 5** present a plan summarizing the facilities required to meet the more conservative objectives for Alternative A.

1.1 Proposed Project Site Alternatives

The proposed Project would be constructed in an unincorporated area of Solano County adjacent to the City of Vallejo (City) boundaries (**Figure 1-1**). The 160-acre (ac) site consists of four parcels located at the intersection of I-80 and Columbus Parkway would be brought into Trust as part of the proposed Project. A map of the location of the site is shown in **Figure 1-2**.

As further described in **Section 2.1**, three separate programs, each comprising of different densities and facilities, will be evaluated as part of this analysis: Alternative A – Proposed Project, Alternative B – Reduced Intensity Project and Alternative C – Non-Gaming Project. See **Appendix A** for a full list of the proposed facilities.

1.2 Report Organization

This report is divided into seven sections as listed below.

- Section 1 – Introduction
- Section 2 – Project Wastewater Flows and Water Demands
- Section 3 – Background and Regulatory Issues
- Section 4 – Water Facility Requirements
- Section 5 – Wastewater Facility Requirements
- Section 6 – Recommendations
- Section 7 – References

HydroScience

Figure 1-1
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Vicinity and Project Location Map

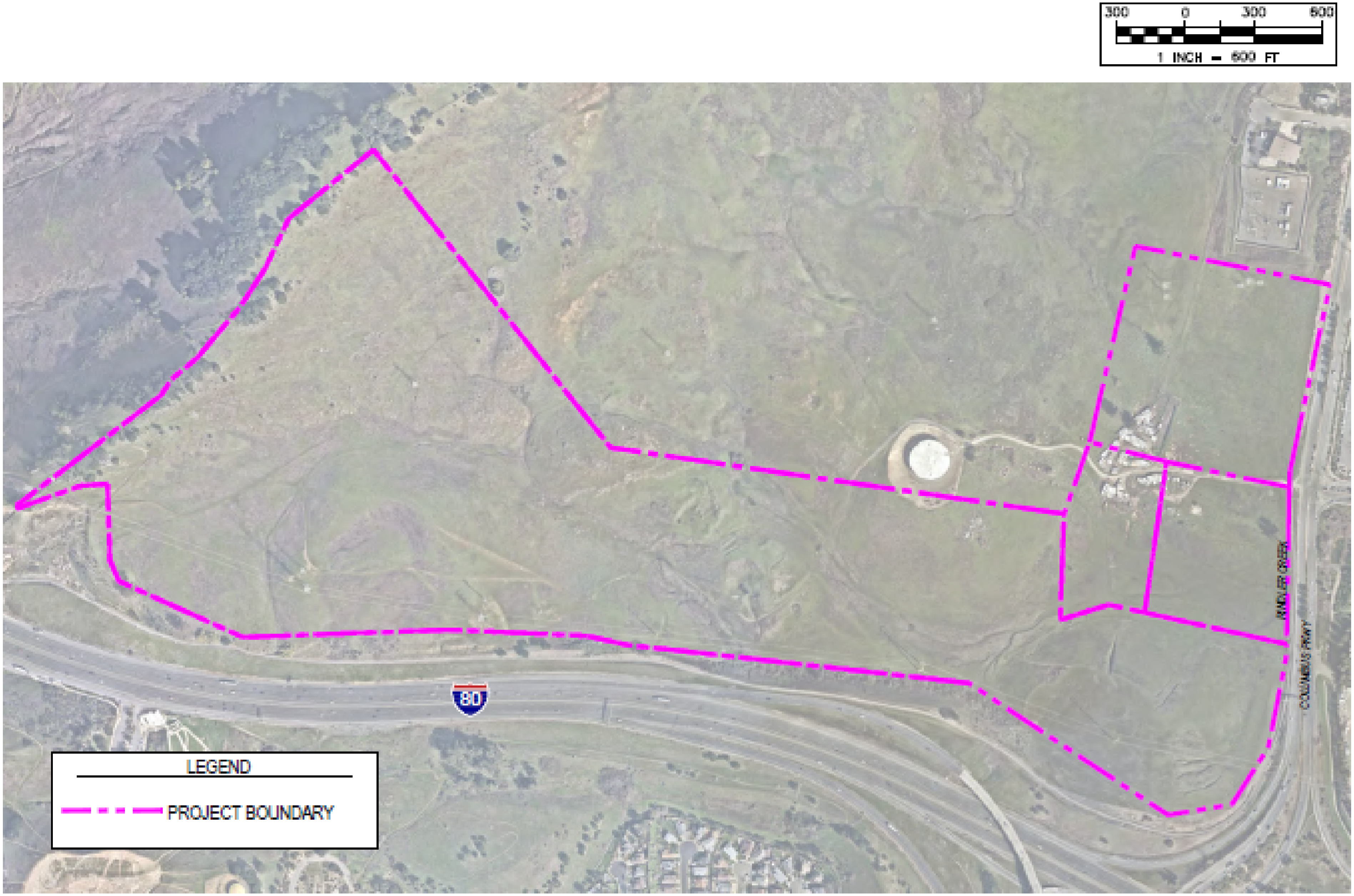

Figure 1-2
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Aerial Site Plan

HydroScience

SECTION 2 – PROJECT WASTEWATER FLOWS AND WATER DEMANDS

This section provides a summary of each of the three program alternatives and the related water and wastewater facility requirements. For each program alternative, the following information is summarized:

- Wastewater generated, including discussions about wastewater quality;
- Effluent reuse and disposal options; and
- Water supply requirements.

Each program alternative is individually described below.

2.1 Program Alternatives

The three program alternatives that are considered in this feasibility study to understand the range of water and wastewater facility needs are each summarized below:

- **Alternative A:** This program includes a total approximate footprint of 615,000 square feet (ft^2), including a casino, multiple restaurants and bars, and a ballroom. Approximately 1,600,000 ft^2 of on-site parking spaces (guest/employee), valet, bus depot, and a loading dock will be located on the site. This program also includes a tribal community which includes 24 single-family homes and a 12,600 ft^2 administrative building. A map of the Alternative A program site plan is included as **Figure 2-1**.
- **Alternative B:** This program includes Alternative A as described above, without the tribal community. A map of the Alternative B program site plan is included as **Figure 2-2**.
- **Alternative C:** This program includes a total approximate footprint of 141,000 ft^2 of hotels and approximately 130,000 ft^2 of commercial space. This program also includes a tribal community of 50 single-family homes and three separate administrative buildings with a total approximate footprint of 23,000 ft^2. A map of the Alternative C program site plan is included as **Figure 2-3**.

Figure 2-1
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Proposed Site Plan - Alternative A

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Figure 2-2
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Proposed Site Plan - Alternative B

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Figure 2-3
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Proposed Site Plan - Alternative C

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2.2 Wastewater

This section identifies the expected strength of wastewater and projected flows for each program alternative.

2.2.1 Wastewater Quality

The quality of influent water for gaming facilities differs from the quality of domestic sewage; typical gaming facility wastes have higher biochemical oxygen demand (BOD) and total suspended solids (TSS) values compared to domestic wastewater, as identified in **Table 2-1**. Shock loadings are also typical of gaming facility wastewater. Wastewater shock loading occurs when a WWTP receives a high flow or high strength discharge outside of its normal loading ranges. Weekend flows are much higher than weekday flows, and evening flows are higher than daytime flows. This occurs due to the higher utilization of casino facilities outside of normal business hours.

Table 2-1: Typical WWTP Influent Water Quality

Parameter	Units	Alternative A	Typical Domestic Sewage
BOD	mg/L	450-600	200-300
TSS	mg/L	450-600	200-300

2.2.2 Wastewater Flows

Average weekday and peak weekend flows for Alternative A, B, and C were developed based on analysis of similar facilities. Real-time data and previous experience developing wastewater flow projections from similar facilities were compared and the most conservative was used to estimate the unit flows for the proposed Project. An occupancy level factor was used to estimate flows for a typical weekday and weekend. The average day flow was estimated using the weighted average of the weekday and weekend estimated flow projections. For non-gaming facilities such as Tribal housing and community buildings, the same weekday and weekend factor was applied. These projections are based on the three Alternative programs provided by Acorn.

Table 2-2 through **Table 2-4** summarize the projections of wastewater volumes generated by Alternative A, B, and C, respectively.

For the full flow projection table see **Appendix A**.

Table 2-2: Projected Wastewater Flows for Alternative A

Area Description	Estimated Occupancy			Wastewater Flow (gpd)	
	Number	Units	gpd/Unit	Wt. Average	Weekend
Casino Gaming and Support Areas	481,988	SF	0.6	102,000	143,000
Employees	3,600	employees	12	35,000	35,000
Restaurants	811	Seats	70	36,000	45,000
Bars & Brew Pub	602	Seats	40	11,000	19,000
Coffee Shop	74	Seats	40	1,000	2,000
Food Hall	182	Seats	60	7,000	9,000
Ballroom / Pre-Function Area	52,794	SF	0.75	14,000	32,000
Cooling Tower Makeup	1	SF	26,737	3,000	3,000
Single-Family Homes	24	EDU	290	7,000	7,000
Administrative Building	30	employees	12	1,000	1,000
			Total Wastewater Generated	**217,000**	**296,000**

Notes:
1. Support facilities are lump sum values for back-of-house for casino, lobby, cashier and club.
2. All flows are rounded to the nearest 1,000 gpd.
3. Total wastewater generated sum may be off due to rounding of individual facility wastewater generated.
4. Weighted average is the sum of the weekday flows over four days plus the sum of the weekend flows over three days divided by seven days.

Based on the wastewater generation rates identified in **Table 2-2**, the Project must have the capability to convey or treat the maximum weekend demand of approximately 300,000 gpd for Alternative A.

Table 2-3: Projected Wastewater Flows for Alternative B

Area Description	Estimated Occupancy			Wastewater Flow (gpd)	
	Number	Units	gpd/Unit	Wt. Average	Weekend
Casino Gaming and Support Areas	481,988	SF	0.6	102,000	143,000
Employees	3,600	employees	12	35,000	35,000
Restaurants	811	Seats	70	36,000	45,000
Bars & Brew Pub	602	Seats	40	11,000	19,000
Coffee Shop	74	Seats	40	1,000	2,000
Food Hall	182	Seats	60	7,000	9,000
Ballroom / Pre-Function Area	52,794	SF	0.75	14,000	32,000
Cooling Tower Makeup	1	SF	26,737	3,000	3,000
			Total Wastewater Generated	**209,000**	**288,000**

Notes:
1. Support facilities are lump sum values for back-of-house for casino, lobby, cashier and club.
2. All flows are rounded to the nearest 1,000 gpd.
3. Total wastewater generated sum may be off due to rounding of individual facility wastewater generated.
4. Weighted average is the sum of the weekday flows over four days plus the sum of the weekend flows over three days divided by seven days.

Based on the wastewater generation rates identified in **Table 2-3**, the Project must have the capability to convey or treat the maximum weekend demand of approximately 300,000 gpd for Alternative B.

Table 2-4: Projected Wastewater Flows for Alternative C

Area Description	Estimated Occupancy			Wastewater Flow (gpd)	
	Number	Units	gpd/Unit	Wt. Average	Weekend
Hotel 1	132	rooms	250	20,000	33,000
Hotel 2	132	rooms	250	20,000	33,000
Cooling Tower Makeup	1	SF	6,131	1,000	1,000
Commercial (2)	129,702	SF	0.1	6,000	10,000
Single-Family Homes	50	EDU	290	15,000	15,000
Administrative Building (3)	90	employees	12	1,000	1,000
Total Wastewater Generated				**63,000**	**93,000**

Notes:
1. All flows are rounded to the nearest 1,000 gpd.
2. Total wastewater generated sum may be off due to rounding of individual facility wastewater generated.
3. Weighted average is the sum of the weekday flows over four days plus the sum of the weekend flows over three days divided by seven days.

Based on the wastewater generation rates identified in **Table 2-4**, the Project must have the capability to convey or treat the maximum weekend demand of approximately 100,000 gpd for Alternative C.

Summary of Projected Design Flows for each Alternative

Table 2-5 summarizes the proposed design flows for Alternative A, B, and C based on the weekend capacity. The design flows are at least 20% higher than the projected flows in order to provide a factor of safety for planning and design to account for the typical diurnal variation. Additional storage will also be provided for equalization of the peak daily flows.

Table 2-5: Summary of Design Flows for Alternative A, B & C

Program Alternative	Parameter	Projected Wastewater Flow (gpd)	Design Flow (gpd)
Alternative A	Average Daily Flow	217,000	300,000
	Average Weekend Flow	323,000	400,000
Alternative B	Average Daily Flow	209,000	300,000
	Average Weekend Flow	312,000	400,000
Alternative C	Average Daily Flow	63,000	100,000
	Average Weekend Flow	93,000	100,000

2.2.3 Effluent Reuse and Disposal

For any alternative considering an on-site WWTP, the WWTP will treat wastewater to a tertiary level and allow the Project to consider a wide range of effluent disposal options. Tertiary treatment is typically defined as a process that has undergone primary treatment consisting of a gravity settling process, secondary treatment consisting of a biological process, and tertiary treatment consisting of both a filtration and a disinfection process. These treatment processes can be combined into one process spanning the different types of treatment.

If available, recycled water meeting Title 22 criteria will be used in the casino restrooms for toilet and urinal flushing. Although the use of recycled water in the restrooms is on Trust lands, the recycled water quality will be designed to produce the equivalent water quality to disinfected tertiary recycled water as defined by Title 22. In general, this quality of recycled water is available for all approved non-potable uses in the State of California.

Recycled water will also be used for cooling tower makeup. This will help reduce storage requirements through cooling tower drift, evaporation system leakage losses, and blowdown. The brine generated as a byproduct of the recycled water treatment will be hauled off-site. Common disposal alternatives include evaporative ponds, disposal to ocean, deep well injection, incineration, additional treatment to concentrate waste, etc. Given the limited area for additional treatment or evaporative ponds, it is anticipated that the brine will be disposed of off-site. Estimation for brine volume, concentration, and disposal will be determined based on source water quality, generated wastewater volume and quality, and specific treatment components.

In order to evaluate other wastewater disposal strategies, the following assumptions were made:

- Recycled water use on-site will be maximized.
- The Project must identify a reliable wet season disposal method.
- The Project must comply with all applicable regulatory requirements.

Landscape Irrigation

The primary criteria used to determine the required landscape irrigation demands are evapotranspiration (ET) rates and precipitation information. Water demands per acre of irrigated area are calculated for each month based on ET rates and precipitation records with an additional factor to account for a very wet year. This monthly demand is then used to calculate an annual disposal capacity per acre in such a wet year.

ET Rates: ET is a measure of water usage by a particular plant or crop, and is a function of the net solar radiation, air temperature, wind speed, and vapor pressure in a particular location. ET rates for a specific crop in a specific location are calculated on a monthly basis by the following equation:

$$ET = ET_o * k_c$$

where:

ET_0 = Normal year reference crop ET rate for a given geographic location (California Department of Water Resources [DWR], California Irrigation Management Information System [CIMIS] database)

k_c = Crop coefficient for a given crop (DWR Leaflets)

For this Project, ET_0 for the CIMIS station closest to the Project site were obtained from the DWR CIMIS database. Crop coefficients for pasture / shrub crops were obtained from a previous project landscape architecture consultant. Calculated ET rates and irrigation demands are shown in **Table 2-6**.

Precipitation: Precipitation data was obtained from the National Oceanic and Atmospheric Administration's (NOAA) online database using the closest station to the Project site. Monthly rainfall values from 1991 through 2020 were averaged to obtain typical monthly rainfall data.

Estimated Unit Irrigation Demands: Typical monthly unit irrigation demands for pasture are summarized in **Table 2-6** and were calculated using the following formula:

$$ID = \frac{(ET - Pe_p)l_r}{e_i}$$

where:

ID = Irrigation demand in inches

ET = Evapotranspiration for turf grasses

P = Average precipitation, NOAA

e_p = Precipitation irrigation efficiency, 0.95. This assumes that approximately 0.5% of rainfall during growing season is lost to evaporation, runoff, etc.

l_r = Loss rate, 1.05. This assumes that approximately 5% of the applied water passes through the grass root zone and is lost.

e_i = Irrigation efficiency, varies throughout the year between 0.60 in the summer and 0.95 in the winter. This assumes that 5-40% of the applied irrigation water is lost to the environment. For planning purposes an irrigation efficiency of 0.80 was used.

Table 2-6: Typical Irrigation Demands for Regional Pasture

Month	ET (inches)	P (inches)	ID (inches)	ID (feet)
January	0.87	5.27	0.00	0.00
February	1.46	4.88	0.00	0.00
March	2.18	3.20	0.00	0.00
April	2.69	1.17	1.53	0.17
May	3.85	0.74	3.11	0.34
June	4.65	0.21	4.44	0.49
July	4.60	0.00	4.60	0.50
August	4.30	0.06	4.24	0.46
September	3.35	0.12	3.23	0.35
October	2.46	0.96	1.50	0.16
November	1.18	2.32	0.00	0.00
December	0.62	5.39	0.00	0.00
Total	**32.20**	**24.32**	**22.64**	**2.48**

Notes:
1. The irrigation demand shown is for average rainfall. A lower irrigation demand was used in the 100-year annual precipitation event.

As shown, above, in **Table 2-6**, the typical annual unit irrigation demand for pasture is estimated at 22.64 inches or 2.48 feet.

The irrigated areas are limited by the proposed Project site plans, topography, and site infiltration capacity. These conditions can contribute to run-off which must be carefully managed when using recycled water. An infiltration study was performed for the Project site in April 2024 which found very low infiltration soil capacities at the site; those results are included in **Appendix B**.

2.3 Water Supply Requirements

There are no existing water demands for the proposed project site. **Table 2-7** compares the projected average annual demands for Alternatives A, B, and C.

Table 2-7: Comparison of Alternative Water Demands

Program Alternative	Average Annual Demand (AFY)	Average Daily Demand (gpd)[1]
Alternative A	322	287,000
Alternative B	312	278,000
Alternative C	82	73,000

Notes:
1. This demand represents indoor water use.

The experience of other similarly sized gaming and entertainment facilities has shown that water demands can be significantly reduced when recycled water is introduced as an alternative water supply source. Although the availability of recycled water has not yet been determined, water supply requirements including the use of recycled water were calculated considering recycled water for toilet flushing, landscape irrigation, cooling tower make-up and other approved non-potable uses under Title 22 regulations. Although it doesn't apply to uses on Trust lands, the recycled water quality would be designed to produce the equivalent water quality to disinfected tertiary recycled water as defined by Title 22.

The average water demand for Alternatives A, B, and C is shown in **Table 2-8**. These projections are based on estimated average wastewater flows (see **Table 2-2** through **Table 2-4**) and include a 20% allowance for system losses as well as a safety factor to ensure adequate supply. Also provided in this table is the projected water demand assuming that recycled water is produced on-site and available to the project. The average water demand is expected to be representative of typical daily water use. Peak water demands, which would typically occur on the weekends, were calculated assuming a peaking factor of 1.5.

Table 2-8: Projected Water Demands for Alternative A, B & C

Program Alternative	Parameter	Projected Water Demands (gpd)[1]	Projected Water Demands with Recycled Water (gpd)[1]
Alternative A	Average Daily Demand	287,000	207,000
	Peak Day Demand	431,000	351,000
Alternative B	Average Daily Demand	278,000	198,000
	Peak Day Demand	417,000	337,000
Alternative C	Average Daily Demand	73,000	61,000
	Peak Day Demand	110,000	98,000

Notes:
1. Assumes augmenting indoor potable use with recycled water use for dual plumbed and cooling purposes.

Preliminary projections of the water supply needed to reliably meet water demand for the programs are summarized in **Table 2-9**. These are preliminary and for planning purposes only.

Table 2-9: Projected Water Supply Design Flows

Program Alternative	Water Supply Requirement without Recycled Water (gpm)	Water Supply Requirement with Recycled Water (gpm)	Minimum Recommended Firm Water Supply (gpm)
Alternative A	300	250	300
Alternative B	300	250	300
Alternative C	100	100	100

Notes:
1. Units of gpm = gallons per minute. All flows rounded to the nearest increment of 50 gpm.
2. Water supply required for Alternative A versus Alternative B is similar due to negligible demands from housing community compared to anticipated Casino demands.

A "firm" water source is considered that which can be supplied by the system with the single largest source out of service in a redundant system. The "firm" water supply is required 24 hours a day, 365-day a year, and must be able to meet the maximum day demand for the Project.

Water system redundancy may be achieved in a variety of ways – in a groundwater system, multiple wells or another redundant source is typically required. Diurnal peaks, fire flow, and other peak demands may be met with storage tanks.

In addition to the use of recycled water, the project alternatives are also expected to be designed and managed to minimize potable water usage. Recommended water conservation measures include low flow fixtures, voluntary towel re-use, central plant optimization, recirculating fountains or water features, if applicable, high efficiency/water conserving appliances, etc. For restaurants, potable water can also be conserved, if only served to patrons who request it. To facilitate this, sub-metering of water for each of the uses within the Project will discourage waste and help identify areas where consumption can be reduced. Employee training and participation, regular maintenance, and customer education are all expected to help reduce water use.

Fire flow requirements (or guidelines) are set by the local fire authorities based on the building's use and classification. Storage requirements for casinos are generally controlled by fire protection requirements and not by domestic peaking requirements. Storage needs will be determined upon issuance of the fire flow and duration requirements from the local fire authority. Referencing the City's Water Master Plan from 2015, the expected fire flow requirements for a large facility such as this will be 4,000 gpm for four hours.

2.3.1 Water Supply

The Project will require a potable water supply for use within the site. Currently, there are no groundwater wells identified on the site or within a half mile radius. A hydrogeological assessment – included as **Appendix C** – was conducted in May 2024 to identify the existing sources of groundwater for the site. The results of the assessment determined that the potential yield of a new well on site is uncertain, seasonal fluctuation affect output of on-site springs, colluvium and alluvium is present on site and variable and may affect yield conditions negatively, and historical mercury mining operations were present near the site which may contaminate any groundwater through the site. Irrigation water could be provided either by reuse of effluent from the proposed on-site wastewater treatment plant (WWTP) as recycled water or by potable water.

For any on-site groundwater well, it is likely that treatment will be required to remove heavy metals based on historical mining activities in the region. A well pump test would also need to be conducted to determine the available pumping capacity and safe pumping yield of the groundwater basin. The number of wells required would be dependent on the capacity of each new groundwater well. At a minimum, sufficient capacity would be required to meet the maximum day demand with the largest source out of service. If a groundwater supply is pursued, the anticipated well capacity, location and operating strategy would be developed further during the testing and design phase.

Due to the uncertainty of the groundwater yield and possible contamination of the groundwater supply, the number of wells and type of treatment are not known. Assumptions have been made for planning purposes and are further discussed in **Section 4.1**.

SECTION 3 – BACKGROUND AND REGULATORY ISSUES

This section identifies the typical regulatory requirements applicable to the Project with respect to the proposed water supply, wastewater treatment, and wastewater discharge methods identified in this report.

3.1 Water Supply

Two options are considered for water supply: on-site groundwater wells or a municipal connection to the City's water system.

3.1.1 Local Hydrogeologic Assessment

As discussed in **Section 2.3.1**, a hydrogeologic assessment (**Appendix C**) was prepared by Engeo to assess the existing sources of groundwater at the Project site. In general, the following conclusions were presented:

- Groundwater supply wells were not located on the Project site or nearby. Previous well pump tests were not conducted on the Project site. The potential yield of the site's soil materials is uncertain.
- The output from the springs is not known although seasonal fluctuation and drought periods will result in reduced spring flow.
- Depths of colluvium and alluvium at the site were variable. Colluvium contains high concentrations of clay which may result in low yield conditions.
- Historical mercury mining operations were present at multiple locations near the site, including St. John's Mine located less than 1 mile northeast of the site. Groundwater contamination with heavy metals is probable due to these operations or from flow through rocks containing heavy metals.

Any groundwater supply used to serve the project must meet all USEPA water quality standards.

3.1.2 City of Vallejo Municipal Connection

In this case, regulatory requirements for water supply for the Project would be met by the City and it is anticipated that the on-site water storage, supply, and distribution facilities would adhere to City standards and requirements, a copy of which is included as **Appendix D.**

Initial review of the City's water distribution system according to the 2015 Water Master Plan indicates that there is adequate system capacity both during maximum day demand, maximum day demand plus fire flow, and peak hour demand conditions. The Project site is located within the City's 292 Zone which has up to 12 MG of storage capacity with the Skyview Tank (currently inactive) and is identified as "Planned Development Commercial."

According to the City's 2020 Urban Water Management Plan (UWMP), there is adequate supply during all years including, normal, single-dry, and multiple consecutive dry years. During the most conservative scenario, the fifth year of a drought, the difference between supply and demand decreases to 21 acre-feet per year (AFY) by year 2035, then increasing again in 2040 and 2045.

There are no shortfalls. While Alternative A demands are 322 AFY, it is assumed that implementation of a Water Shortage Contingency Plan within the City would reduce demand by at least 10% overall yielding up to 3,200 AFY of supply capacity. The UWMP land use designation is based on the General Plan, which identified the site as a combination of "Business/Limited Residential and "Parks, Recreation and Open Space."

3.2 Wastewater Handling

Two options are considered for wastewater handling: a connection to the District's collection system or onsite wastewater treatment.

3.2.1 Vallejo Flood and Wastewater District Connection

For this option, the Project collection system would adhere to the District's Engineering Standards (included as **Appendix E**). The District is responsible for meeting all State Water Resources Control Board (SWRCB) standards and requirements related to sewer system management, wastewater treatment, and disposal/discharge.

The District recently finalized their Sanitary Sewer Collection System Master Plan (Sewer Master Plan) in August 2023. There are many existing identified deficiencies throughout the collection system including areas within the system where the District experiences sanitary sewer overflows (SSOs) during wet weather events. The most notable issues identified in the Sewer Master Plan are related to the Sears Point Pump Station and Tank; this facility is the largest pump station conveying peak flows of 23 MGD with 3.2 MG of storage capacity. The Sewer Master Plan explores increasing pipeline capacity to accommodate peak wet weather flows and/or rehabilitation and replacement in subbasins where inflow and infiltration (I&I) are excessive. The District has invested, and continues to invest, millions of dollars to recapture collection system capacity. The Sewer Master Plan acknowledges that while future flows do not create the need for additional improvements the District is working with developments to contribute to mitigation funding.

The Sewer Master Plan does not evaluate WWTP capacity and deficiencies. The Vallejo WWTP is located at 450 Ryder Street, adjacent to the Mare Island Strait. There is no noted deficiency at the District's WWTP to treat average dry weather flow (ADWF). The WWTP's dry weather capacity is 15.5 MGD and it treats an ADWF of approximately 8 MGD using primary sedimentation, trickling filters, short-term aeration, and sodium hypochlorite for disinfection. Solids undergo lime stabilization, gravity thickening, and dewatering by belt filter press prior to land application. Screenings and grit are transported to a landfill for disposal. Its peak wet weather capacity for secondary treatment is 35 MGD. The WWTP has an additional 25 MGD primary treatment capacity. Thus the peak wet weather discharge capacity of the blended primary and secondary effluent is 60 MGD. According to the District's National Pollution Discharge Elimination System (NPDES) permit, the daily wet weather flow from November 2017 through April 2021 ranged from 3.9 to 60 MGD, up to the wet weather capacity limit.

The permit specifically requires the implementation of actions that will reduce blending at the WWTP. The actions outlined include projects to reduce I&I and peak wet weather flow. These actions to be implemented within the timeframe of the permit (thru March 31, 2028) include:

- Report Annually on Implementation of 10-Year Sanitary Sewer Capital Improvement Plan
- Report Annually on Implementation of Storm Drain Master Plan
- Report Annually on Reducing Inflow and Infiltration Due To Flooding
- Continue Collection System Rehabilitation and Replacement
- Continue Implementation of Asset Management Program
- Continue Updating 10-Year CIP
- Complete Treatment Plant Master Plan
- Implement and Revise Ryder Street Storage Basin Standard Operating Procedures
- Continue and Expand Upper Lateral Program
- Complete Mare Island Pump Station Replacement and Rehabilitation
- Complete North Secondary Clarifier Rehabilitation
- Develop Private Sewer Lateral Inspection Ordinance

3.2.2 On-Site Wastewater Treatment

Any new on-site WWTP will be located on Trust lands. Thus, project permitting will be regulated by the United States Environmental Protection Agency (USEPA). The USEPA is expected to implement the equivalent standards that would be adopted by the Regional Water Quality Control Board (RWQCB) for discharges onto State lands, as defined by the Basin Plan.

The WWTP will be designed to comply with the effluent quality requirements for tertiary level recycled water for unrestricted reuse. The MBR process, which is discussed later in **Section 5.2** is capable of meeting these requirements with minimal modifications.

Nitrogen removal will be achieved in the anoxic basin of the MBR process as discussed in **Section 5.2.4**. If phosphorus removal is required, the MBR process is well suited to provide for phosphorous removal to very low concentrations. Phosphorus removal is enhanced in MBR treatment plants by employing one or multiple of the following operational methods: 1) addition of a coagulant to the aeration basin, 2) a higher solids retention time in the MBR basins, 3) ensuring there is an ample carbon source for the microorganisms, and 4) utilization of a membrane which virtually eliminates any particulate phosphorus in the effluent. The method(s) the Tribe will employ for phosphorus removal will be determined during the WWTP design phase, but those methods would be designed to comply with the NPDES permit effluent limitations.

3.2.3 Sludge Disposal

Sludge (biosolids) produced by the WWTP must also be disposed of in accordance with the California Code of Regulations, Water Code, Resource Conservation and Recovery Act, and the RWQCB policy. These regulations are commonly referred to as the 40 CFR Part 503 Biosolids Rule promulgated by the USEPA. It is anticipated that biosolids produced by the Project WWTP will be disposed of to an off-site landfill in accordance with all regulatory requirements. Prior to off-site disposal, biosolids will be dewatered. The dewatered sludge, also known as cake, would be periodically hauled to a Class III landfill for disposal. The frequency and volume of dewatered sludge is typically determined during the design phase of the project as more data is available on the source water quality and treatment process.

3.2.4 Cooling Tower Brine Generation and Disposal

The flow rate and water quality of brine generation from cooling tower processes is unknown. It will ultimately depend on the water chemistry of the makeup water, type/model of the cooling system and operation of the cooling system. Disposal sources for brine generation from cooling processes generally include off-site disposal or discharge to one or more of the following: receiving municipal utility district, surface water bodies, sewer system, ocean outfall, deep well injection, incineration, and/or environmental service providers. If disposal to the WWTP is the preferred option, further evaluation will be required to determine the maximum limits of constituents of concern, expected brine flow rates, expected water quality monitoring parameters, cycles of concentration, etc. Further evaluation will be needed to determine the brine generation volume and most cost-effective disposal alternative. Similarly for the brine generated from the recycled water treatment process (see **Section 2.2.3**).

3.3 Recycled Water

For any alternative involving on-site treatment, it is expected that the WWTP will produce recycled water for on-site reuse, which will add to the water quality requirements of the effluent from the WWTP. In order to reuse recycled water on non-trust land in California, a Title 22 reclamation permit would be required. The RWQCB typically issues this permit in California. However, on trust land, the USEPA would regulate the use of recycled water use and would be responsible for granting a permit to use recycled water on-site. The USEPA has typically deferred their recycled water standards to California's Title 22 standards for trust land projects in California. Indian Health Service would regulate the use of recycled water on trust lands. For the range of uses considered for this project, it is expected that the WWTP would need to produce disinfected tertiary recycled water in accordance with Title 22 requirements. Disinfected tertiary recycled water meets the following water quality requirements, which are specific to the MBR treatment process expected for the Project's wastewater treatment facility:

- Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:
  - 0.2 NTU more than 95 percent of the time within a 24-hour period; and
  - 0.5 NTU at any time.

- The filtered wastewater has been disinfected by either:
    - A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or
    - A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration. The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

In addition to the aforementioned recycled water quality requirements, there are a number of operational, use, and reporting restrictions identified in Title 22. However, it is not expected that any of these requirements will limit the viability of recycled water reuse on-site, and these requirements are typical for any recycled water use application. All uses of recycled water would have to be approved by USEPA. As long as disinfected tertiary recycled water is produced, there would appear to be no issues associated with this intended use.

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SECTION 4 – WATER FACILITY REQUIREMENTS

Two water supply options are considered to serve the Project. The first option is via onsite groundwater and the second option is thru a municipal connection. Both are described below.

4.1 Groundwater Supply

The hydrogeologic assessment did not identify any groundwater wells within a half mile vicinity of the project site and no history of pump tests on or near the site were available to speak to the availability of groundwater, thus the potential yield is currently unknown. While the available capacity is not known, potential facilities are described herein. Water supply facilities described in this section are preliminary and should be utilized for planning purposes only.

4.1.1 Water Production Wells

The potable water supply system must have a firm reliable supply based on projected water demands. Firm capacity is the remaining water supply capacity with the largest single source out of service. In a well system, it is generally recommended to have a minimum of two wells available for service, so one can be serviced without interrupting the water supply. It is noted that two or more groundwater wells may be required to serve the development depending on the available capacity of each, which is currently unknown. The actual well capacity, location, and operating strategy would be developed during the design phase.

Based on the hydrogeologic assessment, the local groundwater conditions are characterized as fractured bedrock. A deep test hole would be drilled to determine water bearing capacity within the Great Valley Sequence and silica-carbonate rock. Per DWR, the new well will require a minimum radius of 50-ft control zone around the well, to protect the source from vandalism, tampering, and other possible sources of contamination. As noted previously, the hydrogeologic assessment documented historical mercury mining operations near the Project site, one of which is located within one mile of the Project site. Thus there is a likelihood that groundwater will contain heavy metals. The implementation of water treatment to remove mercury, will likely be required to treat the well water.

The number of wells required is not currently known. Each well is expected to have an approximate footprint of 20 feet by 30 feet, including the pump, well, piping, and miscellaneous equipment. Each well would also be setback from any recycled water use area or impoundment as required by Title 22 criteria.

4.1.2 Water Treatment Plant

The USEPA has identified four technologies for treatment of mercury including precipitation, lime softening, media adsorption processes using granular activated carbon (GAC), and membrane filtration using reverse osmosis. Media adsorption using GAC is an effective method of removing a wide range of constituents and is assumed here for planning purposes. Water quality testing will be required to confirm the appropriate treatment methods. It is assumed that two treatment vessels would be installed in series. A typical layout of the treatment plant is shown in **Figure 4-1**. A process flow diagram showing how water is treated within the treatment plant is shown as **Figure 4-2**.

CONTROL BUILDING SPECIFICATIONS:

10' x 10' x (LOW SIDE) W 8' x 10' CANOPY
-SHED STYLE 1:12 SLOPE

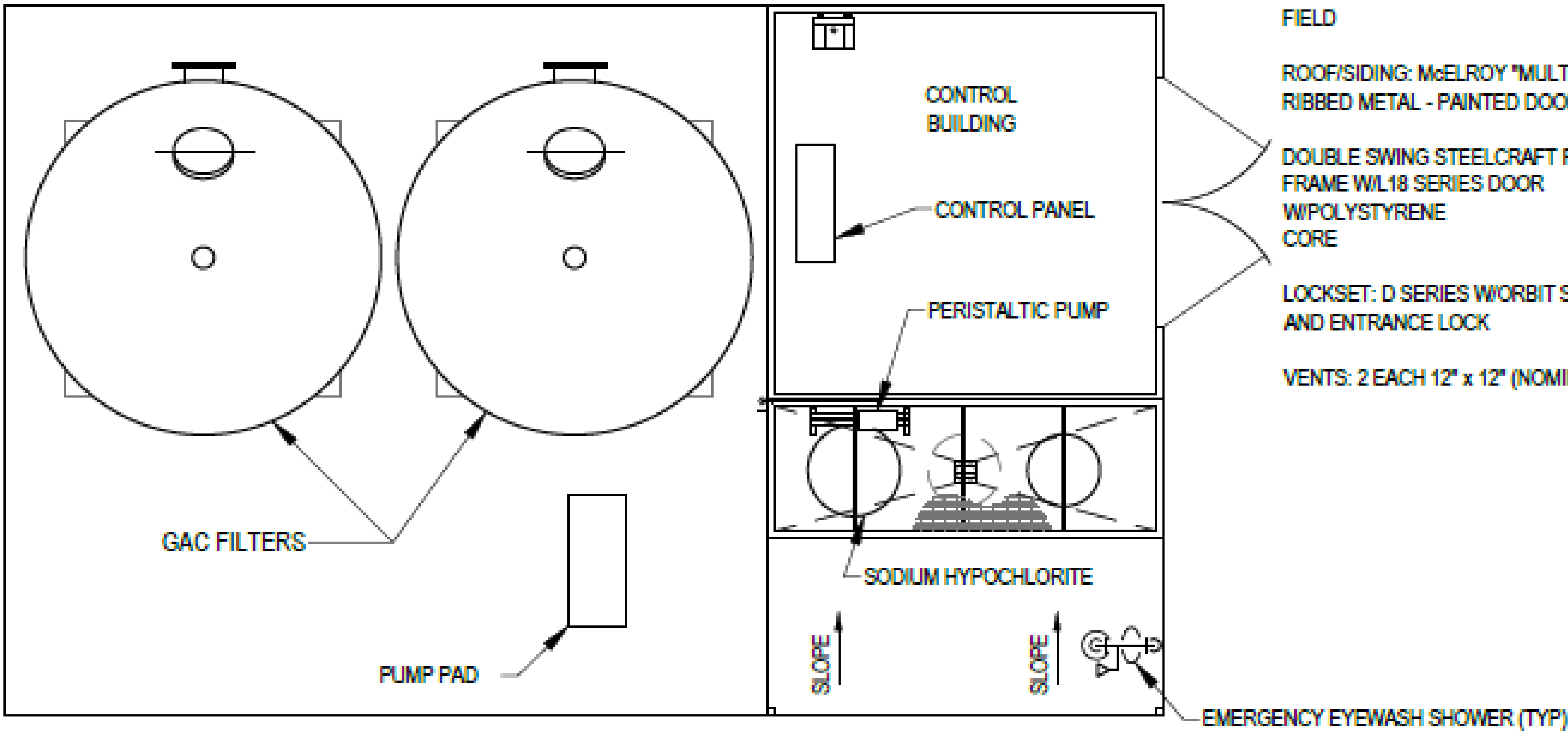
FRAME: 2" x 2" x 120 STEEL TUBE ALL
WELDED WALL SECTIONS TO BE BOLTED IN
FIELD

ROOF/SIDING: McELROY "MULTI-RIB" 28 GA
RIBBED METAL - PAINTED DOOR: 6' x 6'-8"

DOUBLE SWING STEELCRAFT F-16 SERIES
FRAME W/L18 SERIES DOOR
W/POLYSTYRENE
CORE

LOCKSET: D SERIES W/ORBIT STYLE KNOB
AND ENTRANCE LOCK

VENTS: 2 EACH 12" x 12" (NOMINAL)



SITE PLAN
SCALE: 1" = 50'-0"

HydroScience

Figure 4-1
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Preliminary Water Treatment Plant Layout

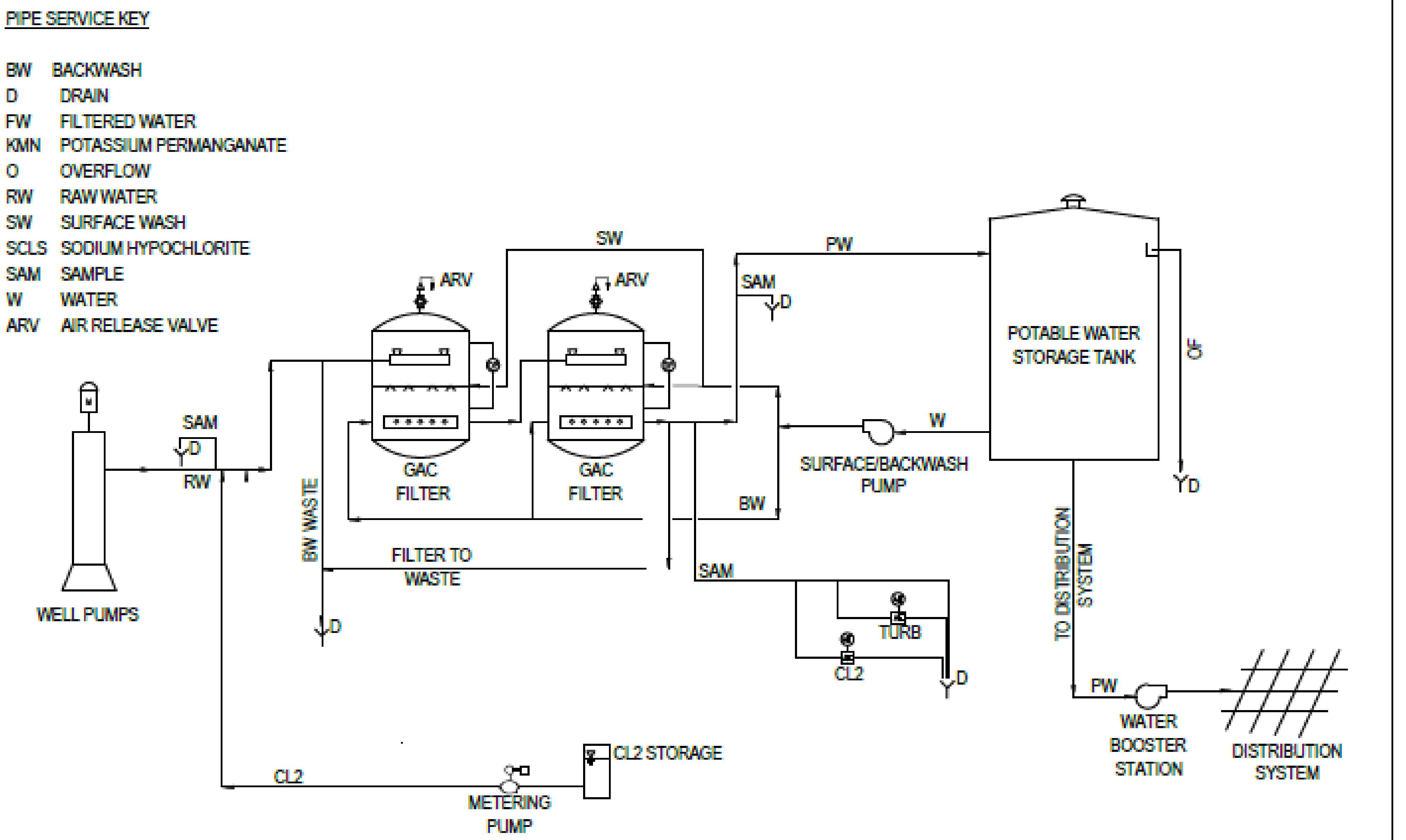


Figure 4-2
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Preliminary Process Flow Diagram

HydroScience

Mercury is removed with simple on/off cycling and infrequent backwashing is required. Gentle breakthrough curve allows for reduced sampling frequency. Pilot testing is required to determine adsorption capacity. Efficiency is subject to competing adsorption by non-target compounds. Sodium hypochlorite would be used to disinfect the water before on-site distribution. A continuous monitoring residual analyzer will monitor chlorine residual at the end of the filters, before entering a water storage tank. Chlorine dosage control would be manual, with options for automatic pacing based on residual. The WTP process facilities would be located within an enclosed building.

Significant features of the plant would include:

- PLC control system interlinked to a common water/wastewater SCADA system.
- Surface wash to reduce the possibility of “mudball” formation on the media surface.
- Fail-safe control valves that would fail in the filter-forward mode of operation.

The recommended WTP design criteria are summarized in **Table 4-1.**

Table 4-1: Recommended Water Treatment Plant Design Criteria

Parameter	Value
Process	Pressure filtration
Media for Adsorption	GAC
Number of filters	2
Filter loading rate	3 gpm/sf
Filter size	10 ft diameter
Disinfection	Sodium Hypochlorite
Process control	PLC/on with service well

Filter media and size may vary based on water quality and Project Alternative water demands. Storage facilities are described in **Section 4.3**.

4.2 Municipal Connection

The second option for Project water supply is connecting to the nearest City of Vallejo municipal water system. There is an existing 6 MG capacity tank located adjacent to the Project site, identified as the Columbus Parkway Tank owned by the City, as well as an easement traversing the Project site for the City’s 24-inch transmission main. A 24-inch transmission main also extends south from the tank to Columbus Parkway.

Initial communication with the City indicates that there is likely adequate storage and flow capacity to serve the Project; however, adequate pressure is not available and would need to be provided by on-site infrastructure. Further coordination with the City is expected to confirm the needed infrastructure to connect to the City’s distribution system and confirm design capacity.

The following section identifies preliminary water storage, and pumping requirements to supply the proposed Project with potable water. The general concept for the water supply facilities is that the Project will include storage and pumping on-site to meet the needs of the Project with water supplied by the City. All new water storage, supply, and distribution facilities would be designed to comply with City standards (**Appendix D**).

The ultimate location of the water facilities will be based on the final design of the Project facilities. All of the recommended water supply facilities described in this section are preliminary and should be utilized for planning purposes only.

4.3 Water Storage Tank and Pump Station

A storage tank would be constructed to store water provided either by the onsite WTP or by the City. For this assessment it is assumed that the storage tank will be designed for maximum day demand plus four hours of fire flow at 4,000 gpm. For the municipal connection option, it is possible that fire flow can be provided with dedicated pumping capacity directly from the City's transmission main allowing fire flow storage to be met by the City's Columbus Parkway Tank.

The storage tank would be of welded steel construction meeting all American Water Works Association (AWWA) specifications for welded steel tanks. A typical section of a tank is shown in **Figure 4-3**. The tank would be a cylindrical shape, and the tank sizing would be based on standard pre-engineered tank dimensions, which are typically in 8-foot increments. It is assumed that the tank would be located at grade. **Table 4-2** provides recommended tank volumes and dimensions for each Alternative.

Table 4-2: Water Storage Tank Capacity and Dimensions

Project Alternative	Max Day Demand[1] (gal)	Fire Flow (gal)	Nominal Tank Volume[2] (MG)	Height (ft)	Diameter (ft)
Alternative A	431,000	960,000	1.5	40	80
Alternative B	417,000	960,000	1.5	40	80
Alternative C	110,000	960,000	1.2	32	80

Notes:
1. See **Table 2-8** for peak day demand. For planning purposes the tanks are sized assuming no recycled water use.
2. Exact volume is to be determined during the design phase of the project.

Proposed siting of a potable water storage tank is provided in **Figure 5-11** and **Figure 5-12**. For a municipal connection, the water storage tank may be filled with the elevation head from the City's tank assuming the top of the Project's potable water storage tank is at, or below, the base elevation of the Columbus Parkway Tank which is 257 ft.

Due to the topography, a pump station would be necessary to pump water from the storage tank to the distribution system. This potable water pump station will be required to convey water from the storage tank to the facilities requiring potable water and would be sized to handle both fire flow and domestic demands. The ultimate pumping capacity will be dependent on fire flow requirements and would be satisfied by two variable-speed high-service pumps that are half the capacity of the projected flow requirement. The pump station would provide enough total dynamic head to serve the highest elevation user at least 40 psi of pressure. High pressures in the lower elevations can be mitigated with pressure reducing valves (PRVs) to create pressure zones with operating ranges between 50 psi and 80 psi. A hydropneumatic tank can sustain pressure and minimize pump starts and stops. **Table 4-3** shows the recommended design criteria for the pump station.

Table 4-3: Pump Station Design Criteria

Parameter	Value
Minimum number of low service pumps	2
Pump type	Variable speed turbine
Minimum number of high service pumps	2
Hydropneumatic tank approximate volume range[1]	1,500 – 2,500 gallons

Notes:
1. Exact volume is to be determined during the design phase of the project. Tank volume is dependent on the desired flowrate and pressure from the hydropneumatic tank.

Proposed locations for the water treatment and storage facilities for each alternative are shown at the end of **SECTION 5** in **Figure 5-11** and **Figure 5-12**.

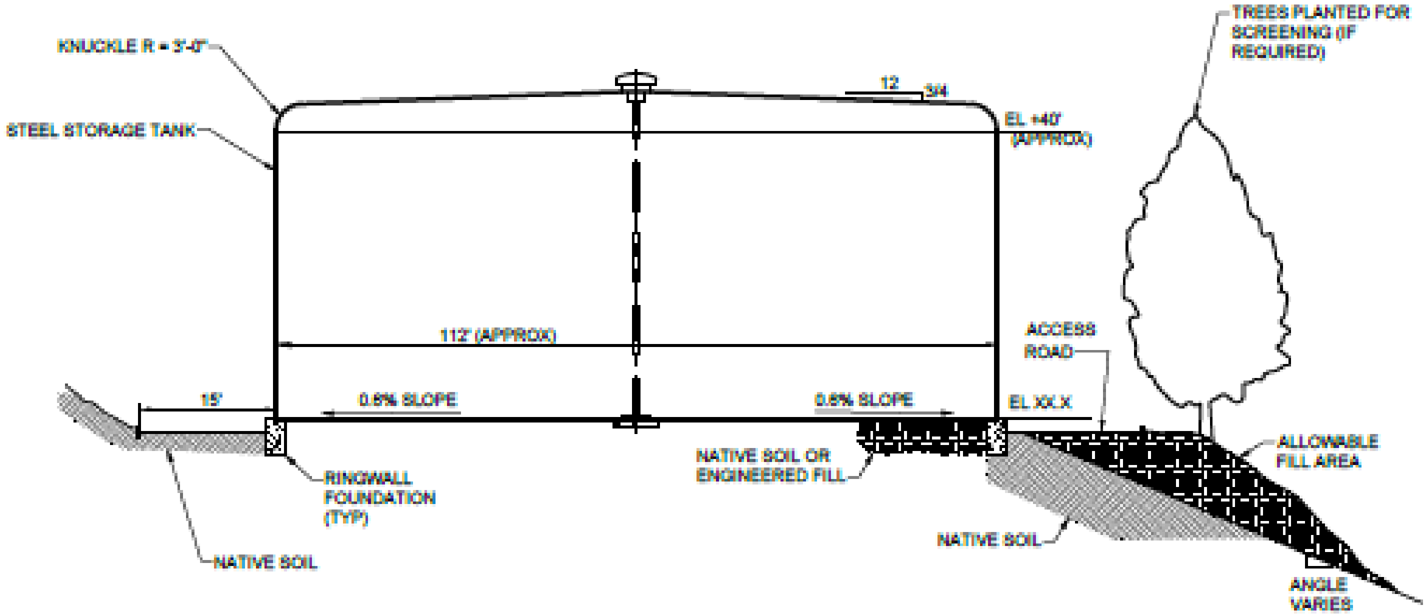


Figure 4-3
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Typical Water Storage Tank

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SECTION 5 – WASTEWATER FACILITY REQUIREMENTS

This section identifies feasible preliminary options for wastewater collection, treatment, effluent discharge, and recycled water facilities required to manage wastewater generated by the proposed Project.

The general concepts for the wastewater facilities are to develop an on-site collection system and connection to the VFWD collection system or provide on-site treatment with a combination of on-site and off-site recycled water use. The intent is to comply with all applicable permitting requirements discussed in **Section 3.2** and ensure that any wastewater or recycled water facilities are designed in a manner that does not limit existing uses or future expansion. This section describes the following facilities:

- VFWD Connection
- On-Site WWTP
    - Discharge Facilities
    - Operations and Maintenance
- Recycled Water

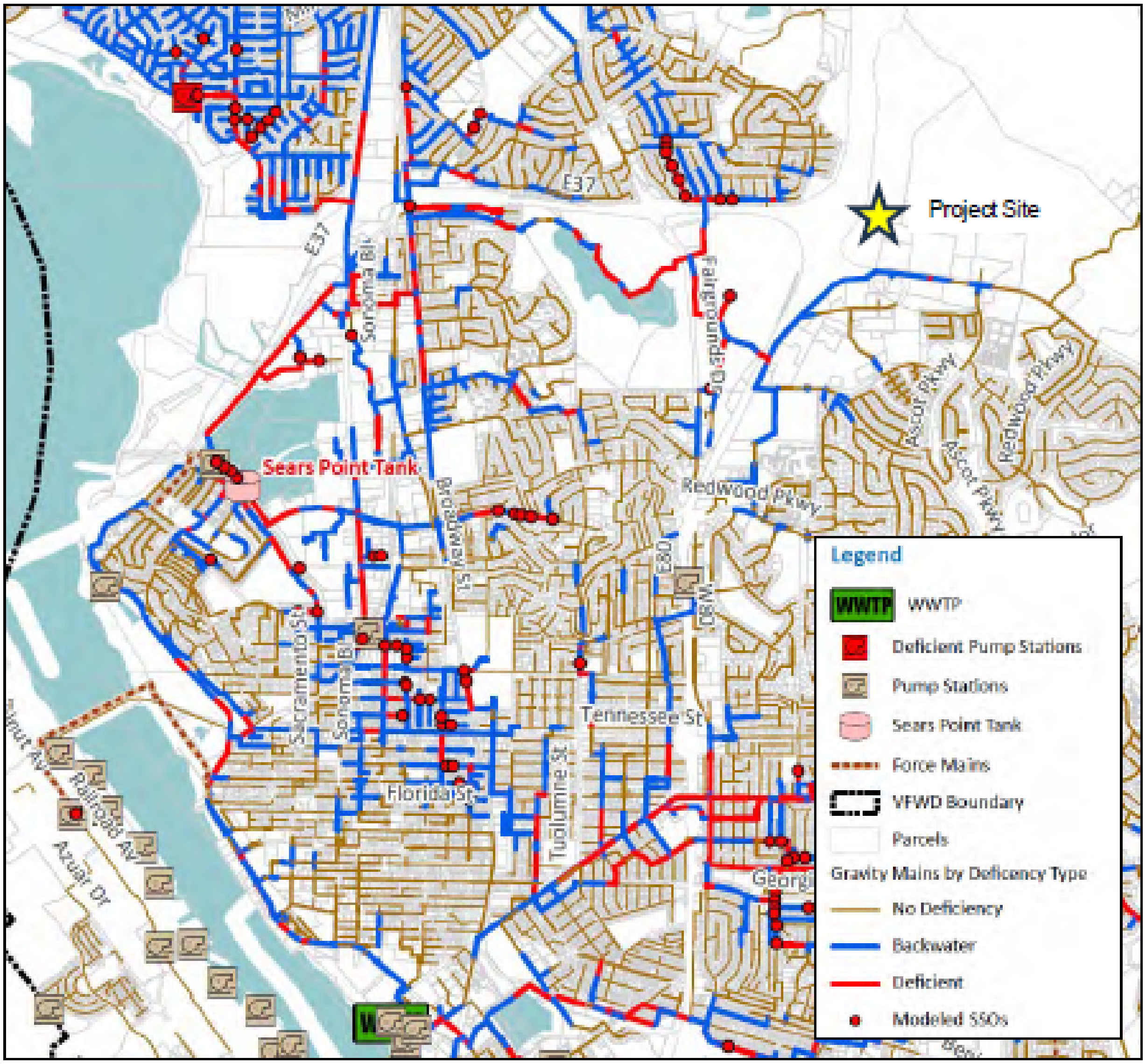
Wastewater from the casino/residential facilities would be conveyed via an on-site gravity sewer collection system. Sewer pipelines would likely be laid along planned roadways within the parcel to facilitate future maintenance. Due to the topography, it is expected that wastewater would flow by gravity to the point of connection to the VFWD system or to a lift station where it would then be pumped to the WWTP headworks.

The ultimate location of the wastewater facilities will be based on the final design of the Project facilities and the chosen method of wastewater disposal. All of the recommended wastewater facilities described in this section are preliminary and should be utilized for planning purposes only.

5.1 VFWD Sewer Connection

There is an existing 12-inch pipeline in Columbus Parkway that currently serves a smaller tributary area to the east along with the Hiddenbrooke development. This area was developed in the 1970s, 1980s, and 1990s and there are no identified deficiencies at, or immediately downstream of, the point of connection to the 12-inch pipeline; however, it is noted that downstream in the collection system there are deficiencies during the design storm causing backwater effects in the 12-inch pipeline along Columbus Parkway, see **Figure 5-1**. Backwater in the pipeline is a result of deficiencies and bottlenecks downstream of the point of connection.

Figure 5-1: Existing System Deficiencies

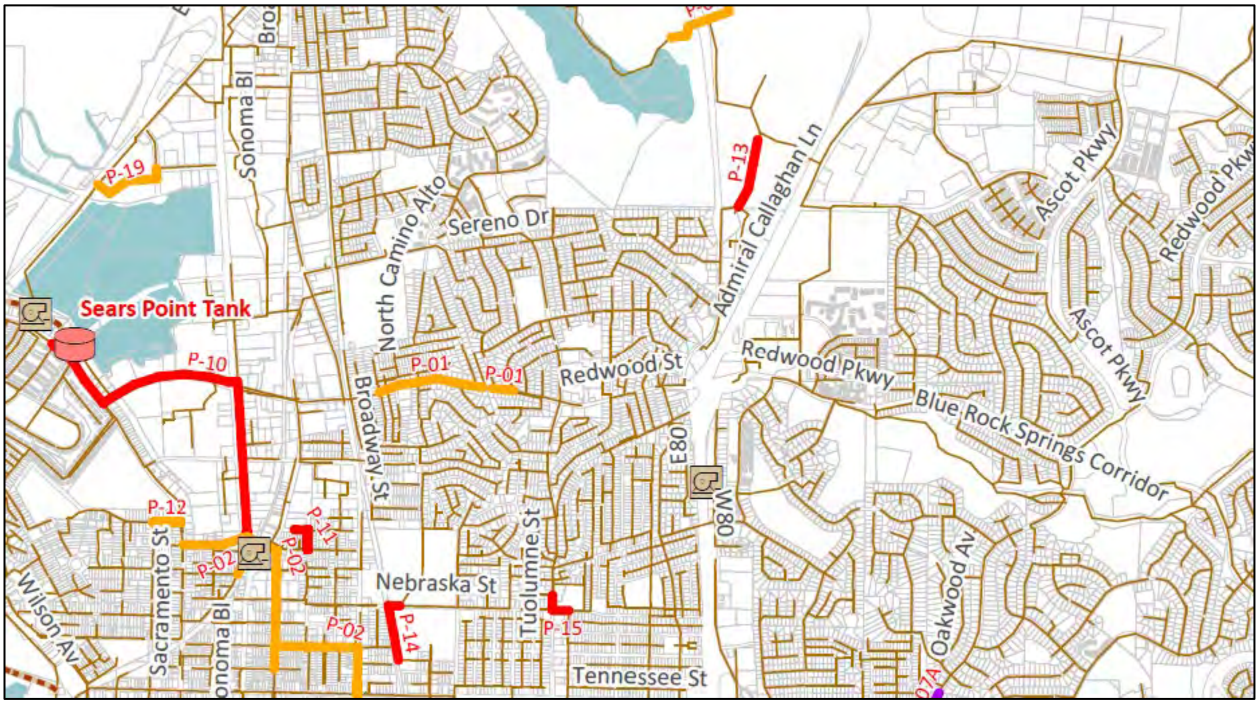


Source: Sanitary Sewer Collection System Master Plan, VFWD, August 2023, Figure 6.21

One of the more significant relevant deficiencies is located at the Sears Point Storage Tank, which is noted to exceed capacity during design storm simulations. Historically, the storage tank has approached capacity during lesser storm events. The District has invested, and continues to invest, millions of dollars to address I/I issues in the collection system to free up collection system capacity.

The District is implementing a number of improvement projects to address system capacity. There is a proposed pipeline upsize as shown in **Figure 5-2** as project *P-13*; while the Sewer Master Plan does not explicitly identify this project to alleviate the backwater effects in Columbus Parkway, it does appear to be one of the bottleneck located downstream of the point of connection likely contributing to the backwater effects in Columbus Parkway. Other projects located further downstream (i.e. *P-01* and *P-10*) may further alleviate the backwater issue. The District is also implementing general system capacity improvement projects to alleviate the impact to the Sears Point Tank and Pump Station.

Figure 5-2: VFWD Planned CIP



Source: Sanitary Sewer Collection System Master Plan, VFWD, August 2023, Figure 8.1 Capital Improvement Plan Phasing

To assess connection feasibility, the District requires applicants to contract with the District to conduct a Sewer Study to assess available capacity of the existing collection system to handle wastewater flow from new developments and identify any potential on-site or off-site impacts. Guidelines for the Study are detailed in the District's 2020 Engineering Standards included as **Appendix E**. The District consultant conducts these analyses. The Tribe would coordinate an agreement with the District to execute this analysis. The Sewer Master Plan acknowledges that while new development flows do not necessarily create the need for additional improvements, the Tribe can anticipate negotiating with the District to contribute to mitigation funding.

5.2 Wastewater Treatment Plant

An alternative to a wastewater connection with the District will be to develop an on-site WWTP and pursue opportunities to use recycled water on-site and partner with the City and District to implement recycled water opportunities within the City.

Traditional wastewater treatment options, such as primary clarifiers, activated sludge, conventional filtration, and disinfection, were not considered as WWTP options due to the limited proposed treatment area layout. Any wastewater treatment process selected for use must be able to handle the high strength waste and react well to wide variations in flow. A proposed on-site WWTP treatment process would include:

- Coarse Screening Facility,
- Influent Pump Station,
- Headworks,
- Equalization,
- Packaged Immersed Membrane Bioreactors (MBRs),
- Ultraviolet (UV) Disinfection & Chlorination,
- Sludge Storage and Dewatering Station,
- Plant Drain and Supernatant Return Pump Station,
- Effluent Pump Station, and
- Operations Building.

The MBR treatment process was selected for various reasons, including: 1) the desire for a small footprint for an on-site WWTP, 2) the proven effectiveness of this process at other similar facilities, and 3) the production of high-quality effluent suitable for reuse and discharge. Additional justification for selection of this treatment process is summarized below.

The MBR treatment process is a tertiary treatment process similar to an activated sludge treatment plant, but with membranes immersed in an aeration basin. A typical MBR system consists of an anoxic tank for denitrification of the plant influent, followed by an aeration tank for oxidation of organic matter and nitrification. Membrane cartridges are suspended at the effluent end of the aeration tank. The membranes have a pore size in the sub-micron range and are able to filter out most of the coliform bacteria and solids. Water is drawn through the membranes by blowers, which pull a slight vacuum and force this permeate into the center of the spaghetti-strand shaped membranes. Solids are left in the aeration tank for recirculation to the anoxic zone and/or wasting to solids handling process(es).

This treatment typically results in producing MBR effluent of excellent quality; effluent from these types plants typically contain no suspended solids and have a turbidity of less than 0.2 NTU. The MBR process also provides aeration, nitrification, and denitrification processes within a compressed footprint. These processes have the effect of producing effluent with a neutral pH, lower nitrogen concentrations, and lower phosphorous concentrations than alternative tertiary treatment processes.

The MBR treatment process is capable of producing effluent meeting the Title 22 coliform bacteria effluent requirements without the use of chlorine or other common disinfectants. Other tertiary treatment systems typically require a disinfection process to meet the effluent coliform requirement. However, in order to comply with treatment and water reuse regulations, both UV disinfection and chlorine disinfection processes will be provided downstream of the MBR processes.

Although the MBR treatment process is somewhat sophisticated, it is relatively simple to operate and maintain due to the absence of traditional WWTP components such as clarifier mechanisms or drives. In addition, there is a long history of effectiveness at similarly-sized gaming facilities with discharge permits to land and surface water.

Proposed locations for the wastewater facilities in each alternative are shown at the end of this section in **Figure 5-11** and **Figure 5-12**.

Operation: Typically, wastewater will flow by gravity from the facilities through a grease interceptor, coarse screening facility, and then into an influent pump station. The coarse screening facility would remove larger solids and debris that are typically found in casino/hotel sewage. The influent pump station will lift the wastewater to the plant headworks facilities through a pressurized sewer main. After passing through the headworks, wastewater will flow by gravity to the influent distribution channel. The distribution channel will be used to distribute wastewater to the parallel MBR trains. Each train will be equipped with an anoxic basin and an aeration basin to provide oxidation, nitrification, and denitrification. Water will flow out of the aeration basin and into a membrane chamber that will be shared by both process trains. Permeate will be extracted through the membranes and conveyed to the UV disinfection process followed by chlorine dosing for residual management.

The proposed wastewater flow diagram is shown in **Figure 5-3**. Major components are described in more detail in the following subsections.

5.2.1 Lift Station

Wastewater will be pumped through a sewage transmission pipeline from the lift station to the headworks of the WWTP. It is likely that a duplex wet well sewage lift station with a standby pump will be required to convey sanitary sewage to the WWTP. The lift station wet well will also be used to collect surface water runoff from the treatment site.

Recommended design criteria for the lift station(s) are shown in **Table 5-1**. A figure showing a typical sewage lift station layout is shown in **Figure 5-4**. The station should be designed to lift the maximum daily flow with one pump out of service.

Table 5-1: Recommended Sanitary Sewage Lift Station Design Criteria

Parameter	Value
Purpose	Lift raw wastewater to WWTP facilities
Type	Submersible non-clog centrifugal
Quantity	Two (one duty, one standby)
Controls	Variable speed, level switch start and shutoff

5.2.2 Coarse Screening Facility

The coarse screening facility for the WWTP is typically gravity fed and upstream of the lift station wet well. Due to the sources and quality of the wastewater, it is important to remove large debris to protect the downstream processes, specifically the pumps. Sewage lift station pumps typically handle solids less than 3 inches in diameter. A typical layout for the coarse screening facility is shown in **Figure 5-5**. **Table 5-2** shows some of the design criteria for the coarse screening facility.

Table 5-2: Coarse Screen Design Criteria

Parameter	Value
Coarse screening facilities	Enclosed bar screen, multi-rake style, ¼-inch bar spacing, washer/compactor system, and bar screen bypass system
Metering facilities	Magnetic flow meter on influent pipe
Odor control	Corrosion resistant plate covered channels, soil filter
Control	Continuous operation

5.2.3 Headworks

The headworks for the WWTP would typically include influent flow measurement, rotary type fine screens, and any required grit removal facilities. Due to the sources and quality of the wastewater, it is not expected that grit removal facilities are required at this time. However, fine screens are required to protect excessive fouling of the MBR membranes. The fine screens typically include a built-in washer/compactor and 2-mm openings that remove hair, inorganics, and wastes to protect the integrity of the membrane filters downstream. The washed and compacted screenings collected at the headworks are typically stored in bins on-site to be periodically disposed of at a landfill.

The raw influent would be pumped by the collection system pump station through the headworks facility. After flow measurement, influent would be routed to a covered headworks influent box for distribution to two influent channels. During normal operation, one channel would be in-service, with the other available as a standby. Slide gates would control flow to each channel. Each headworks channel would be sized to match the hydraulic capacity of the plant. Within the channels would be rotary type fine screens to remove large materials from the raw influent. A map showing a typical layout for the headworks facility is shown in **Figure 5-6**. **Table 5-3** shows some of the design criteria for the headworks facility.

Table 5-3: Headworks Design Criteria

Parameter	Value
Screening facilities	Enclosed cylindrical screen with 2-mm circular perforations, integral shaftless helical scraper/conveyor and compactor, mechanical washer to break up fecal material
Metering facilities	Magnetic flow meter on influent pipe
Odor control	Corrosion resistant plate covered channels, soil filter
Control	Continuous operation

5.2.4 Immersed Membrane Bioreactor System (Packaged)

An MBR is recommended because of the ease of permitting the plant due to the high-quality effluent, and the effluent's potential suitability for recycled water and discharge. Sewage would travel between the headworks and the MBRs within a covered influent distribution force main. The force main would pass through headworks to an influent splitter box that would evenly distribute the flow to the two MBR process trains. Sluice gates would be provided to isolate basins for maintenance.

Each MBR process train is divided into three sections: an anoxic section, an aerobic section with mechanical mixers, and an aerobic section containing the immersed membranes. A typical layout for the MBR is shown in **Figure 5-7**. The proposed WWTP would meet the design flow requirements specified in **Section 2.2.2**. The general configuration of the packaged MBR would be as follows.

Anoxic Basin: Within the anoxic basin, the influent is mixed with mixed liquor in a tank with dissolved oxygen (DO) equal to zero. The mixed liquor is pumped back to the anoxic basin from the immersed membrane section of the MBR. The introduction of new influent wastewater to the basin provides a substrate for the return activated sludge to respire and synthesize. The lack of DO in the basin facilitates nitrification and denitrification. Ammonia compounds are converted to nitrates by nitrifying bacteria. Denitrifying bacteria convert nitrates to nitrogen gas, which volatilize out of the basin. The proportion of recirculated mixed liquor to the volume of influent is approximately 6:1. The anoxic basin has a relatively small retention time compared to the aeration basin or the immersed membrane section, due to its smaller volume.

Aeration Basins: The mixed liquor produced by the anoxic basin would flow by gravity through a short channel to the adjacent aeration basin. The aeration basin differs from the anoxic basin in that this basin contains DO which is introduced to the tank through a series of fine bubble diffusers connected by headers and pumped by a series of blowers. The DO is required to convert dissolved organic material into a filterable solid material. In this process, aerobic bacteria utilize the carbon in the wastewater for respiration and cell synthesis. The primary outcomes from this basin are an overall reduction in BOD and the production of a filterable floc.

Immersed Membranes: The microfiltration membranes are long, hollow, spaghetti-like fibers with a nominal pore size of between 0.1-0.4 microns. Each of the individual microfiltration membranes is bundled together into modules, and each module is approximately 6 inches in diameter and 5 feet tall. The modules are grouped into sets, called cassettes, which are immersed into the mixed liquor solution. Each of the membrane modules is attached to headers, which create a suction and force water (permeate) through the membrane into the hollow center and onwards to the disinfection process. The mixed liquor that is not forced through the membrane is recirculated back to the anoxic zone. A portion of this recirculated mixed liquor is wasted to the dewatering system and disposed.

Each MBR train contains one permeate pump to force water through the membrane, with one additional standby permeate pump for the overall process that can draw from either train. These pumps can also pump permeate to the backpulse tanks, where water is stored in order to backwash the membrane. The permeate pumps also function as backpulse pumps, which pump permeate from the permeate tanks back to the membranes and keeps solids from accumulating on the membrane surface. The membranes are typically backwashed every 15 minutes, and each backwash lasts about two minutes. The entire backwash process is controlled by a programmable logic controller (PLC), which operates automatic control valves and isolates the membranes from the permeate pumping process. Sodium hypochlorite and/or citric acid is typically injected into the backpulse flow to facilitate membrane cleaning and prevent regrowth in the membrane modules.

Other facilities: A number of pumps, blowers, chemical storage, chemical metering, control, and electronic facilities are required in order to operate the MBR process. Some of these facilities are typically located in a building near the MBR process or are included on an equipment pad near the MBR system fully enclosed with sound attenuation provisions. Typically, an operations building is constructed which houses plant controls, the motor control center, maintenance facilities, chemical storage and metering, a laboratory, restroom/washroom, and offices/space for staff. During design development, these facilities will be further defined. **Figure 5-8** shows the proposed electrical, controls, and operations building.

It is typical for a wastewater facility design to include equalization and emergency storage capacity. Equalization capacity would be accomplished by a concrete tank either at or below grade of a to-be-determined volume and size to moderate the peak daily flows entering the WWTP. Emergency storage is typically a buried concrete or reinforced plastic tank that is gravity fed and drained from the sewage lift station designed to provide sufficient capacity for a peak flow event (or to-be-determined volume) if the lift station fails to deliver.

5.2.5 Ultraviolet Disinfection

Disinfection to meet discharge and reclamation virus and coliform water quality standards would be provided by constructing or installing a UV disinfection system in the operations building. UV disinfection facilities are typically contained within a long, narrow steel channel tank or pipe channel, with banks of UV lamps situated in a laminar flowing channel. A weir would control the water level in the channel, ensuring that the lamps are always submerged. Each UV lamp emits a light with a specific wavelength that is capable of inactivating bacteria and viruses, preventing them from reproducing. A proposed location for UV facilities is shown in **Figure 5-8** in the operations building floor plan. **Table 5-4** shows a summary of the recommended UV disinfection design criteria.

Table 5-4: UV Disinfection Design Criteria

Parameter	Value
Lamp location	In-line
Type of lamps	2020W medium pressure UV lamps
Transmittance	65% through quartz sleeve
Flow metering	Magnetic flow meter

5.2.6 Chlorine Disinfection

Though the UV facilities would be designed to disinfect the treated wastewater, they do not continue to disinfect the wastewater after it leaves the UV channel. In order to prevent regrowth of bacteria in the recycled water distribution system, sodium hypochlorite is typically added in small quantities. The introduction of this chemical creates a residual concentration of chlorine that persists in the recycled water and ensures that it is safe to use after it leaves the WWTP. Typical recycled water distribution systems require at least a positive chlorine residual at the point of use, and the dosing of sodium hypochlorite will be adjusted to meet this goal. It is believed that a dose of between 2-3 mg/L for recycled water used for on-site irrigation, cooling, or toilet/urinal flushing would suffice. Chlorine would be dosed at a location downstream of the UV disinfection facilities, and before recycled water is pumped to the recycled water storage tank.

Sodium hypochlorite is a very common disinfectant in the treatment and disinfection of wastewater. It is used throughout the wastewater industry for chlorine disinfection, and when used in accordance with that chemical's SDS, is safe for use for this purpose.

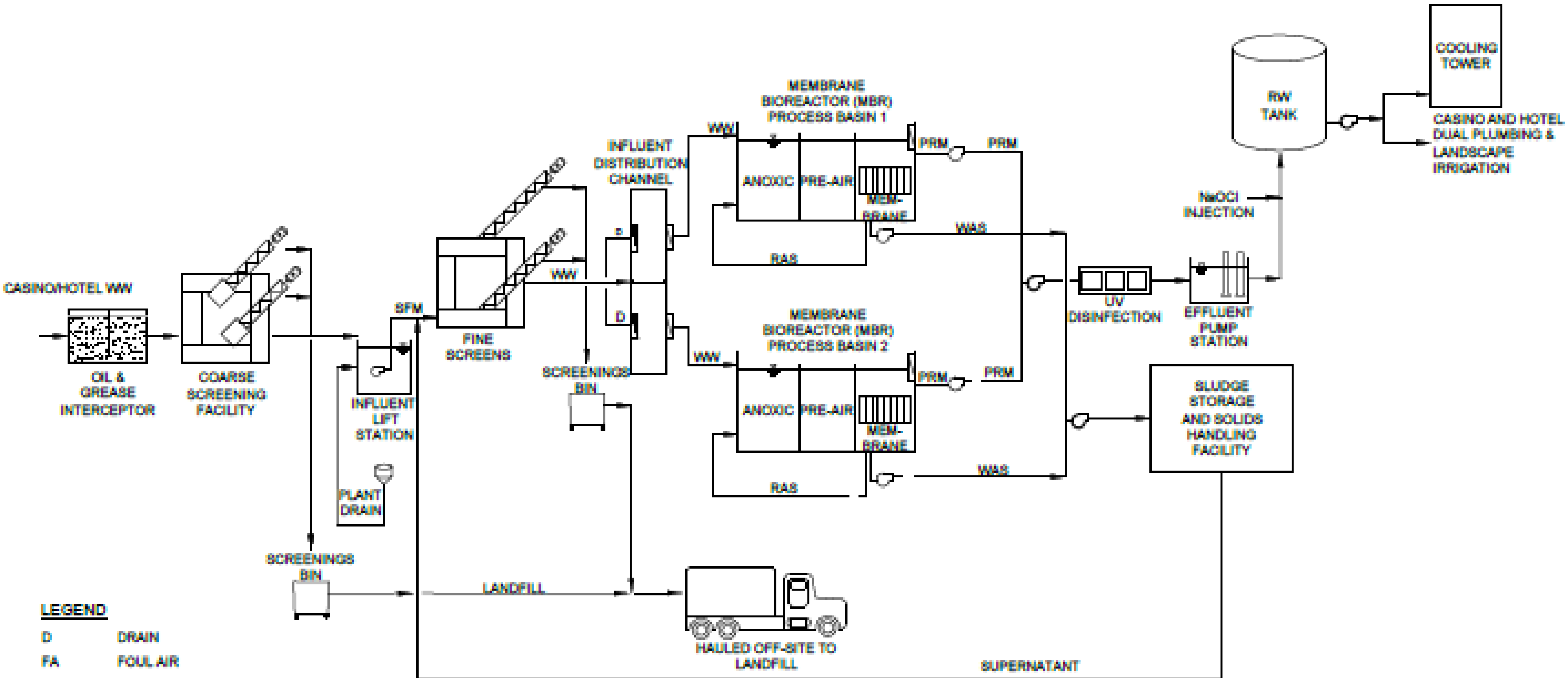
5.2.7 Effluent Pump Station

The purpose of the effluent pump station would be to pump treated wastewater to the recycled water storage tank for storage and use/disposal.

5.2.8 Operation and Maintenance

A detailed description of the operations and maintenance program will be prepared following completion of the WWTP design. However, it is expected that the WWTP would be operated and maintained similarly to the standards of other tertiary WWTPs in California.

To this effect, this WWTP will be staffed with operators who are qualified to operate the plant safely, effectively, and in compliance with all permit requirements and regulations. It is expected that the operators will have qualifications similar to those required by the SWRCB Operator Certification Program. This program specifies that for tertiary level WWTPs with design capacities of 1.0 MGD or less, the chief plant operator must be at least a Grade III operator. Supervisors and Shift Supervisors must be at least a Grade II.



LEGEND

D	DRAIN
FA	FOUL AIR
OF	OVERFLOW
PRM	PERMEATE WATER
PW	POTABLE WATER
RAS	RETURN ACTIVATED SLUDGE
RW	RECYCLED WATER
SFM	SEWER FORCE MAIN
WAS	WASTE ACTIVATED SLUDGE
WW	WASTEWATER

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Figure 5-3
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Wastewater Treatment Process Flow Diagram

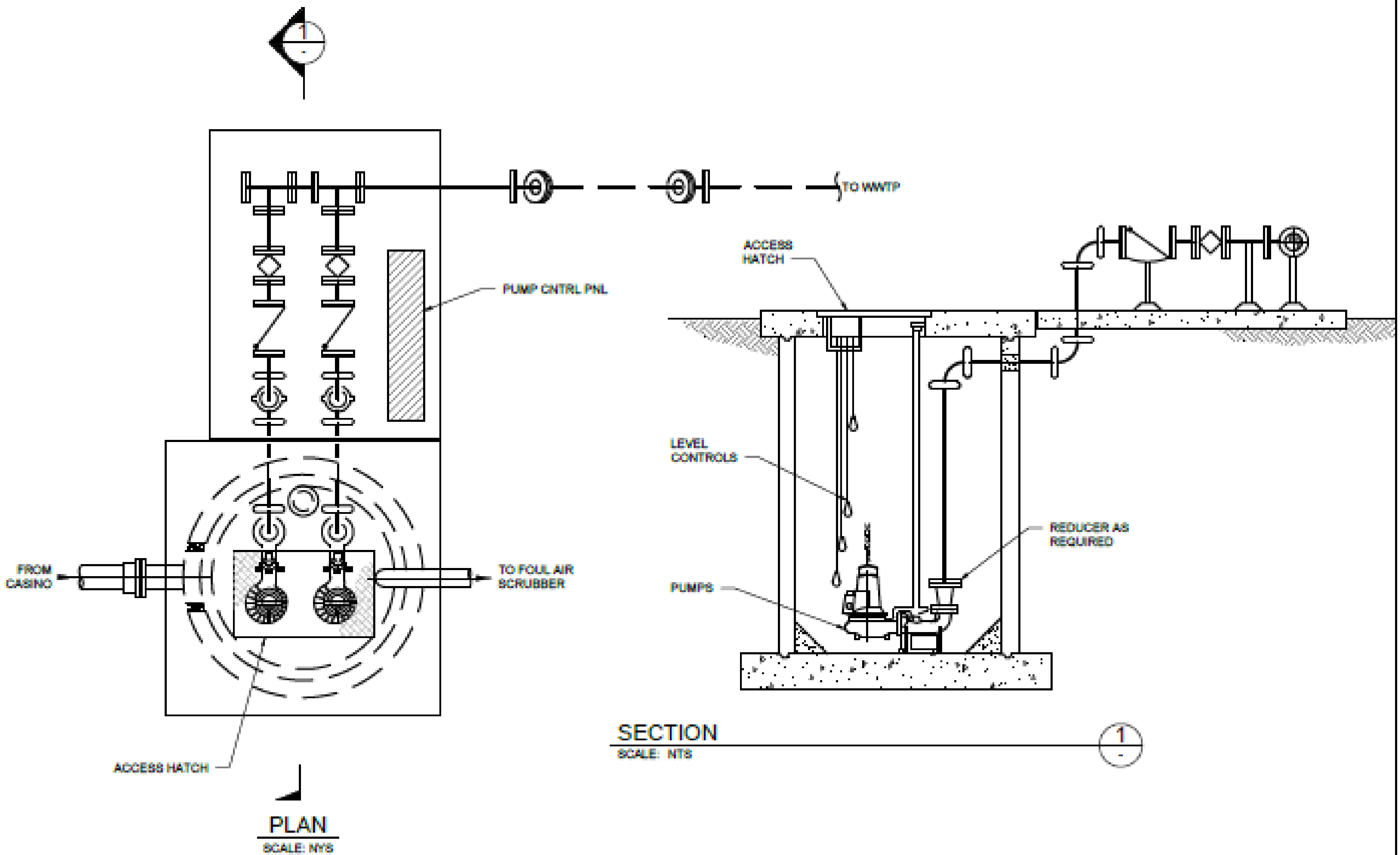

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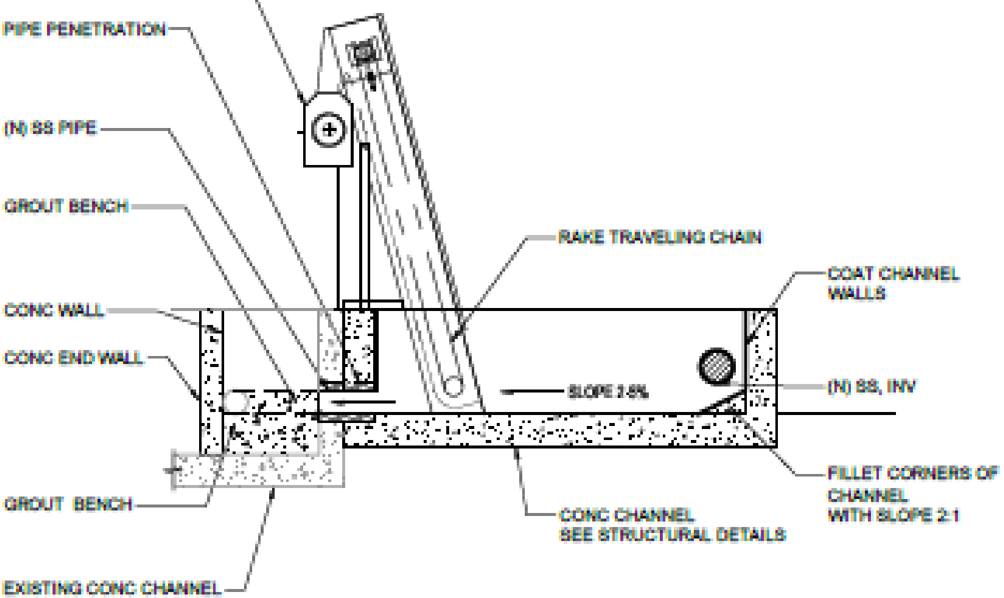
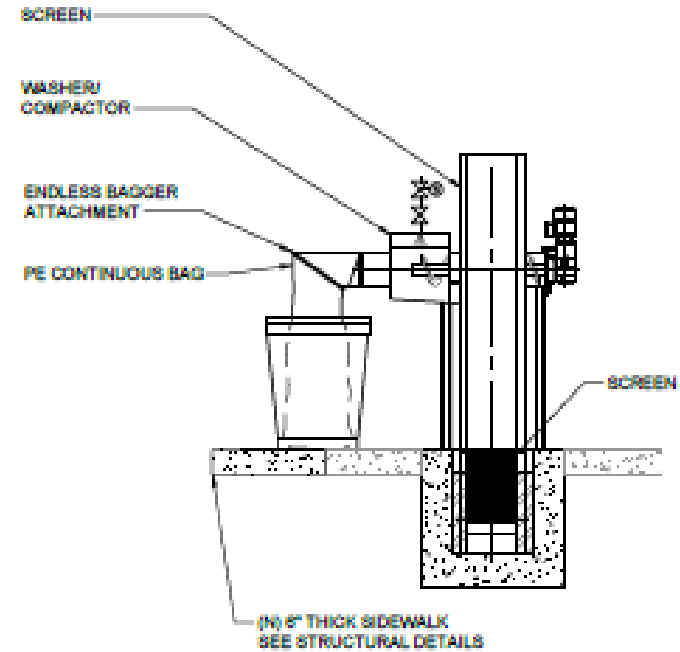
Figure 5-4
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Typical Influent Lift Station



TYPICAL SCREEN SECTION A
SCALE: NTS



TYPICAL SCREEN SECTION B
SCALE: NTS

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Figure 5-5
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Typical Coarse Screening Facility

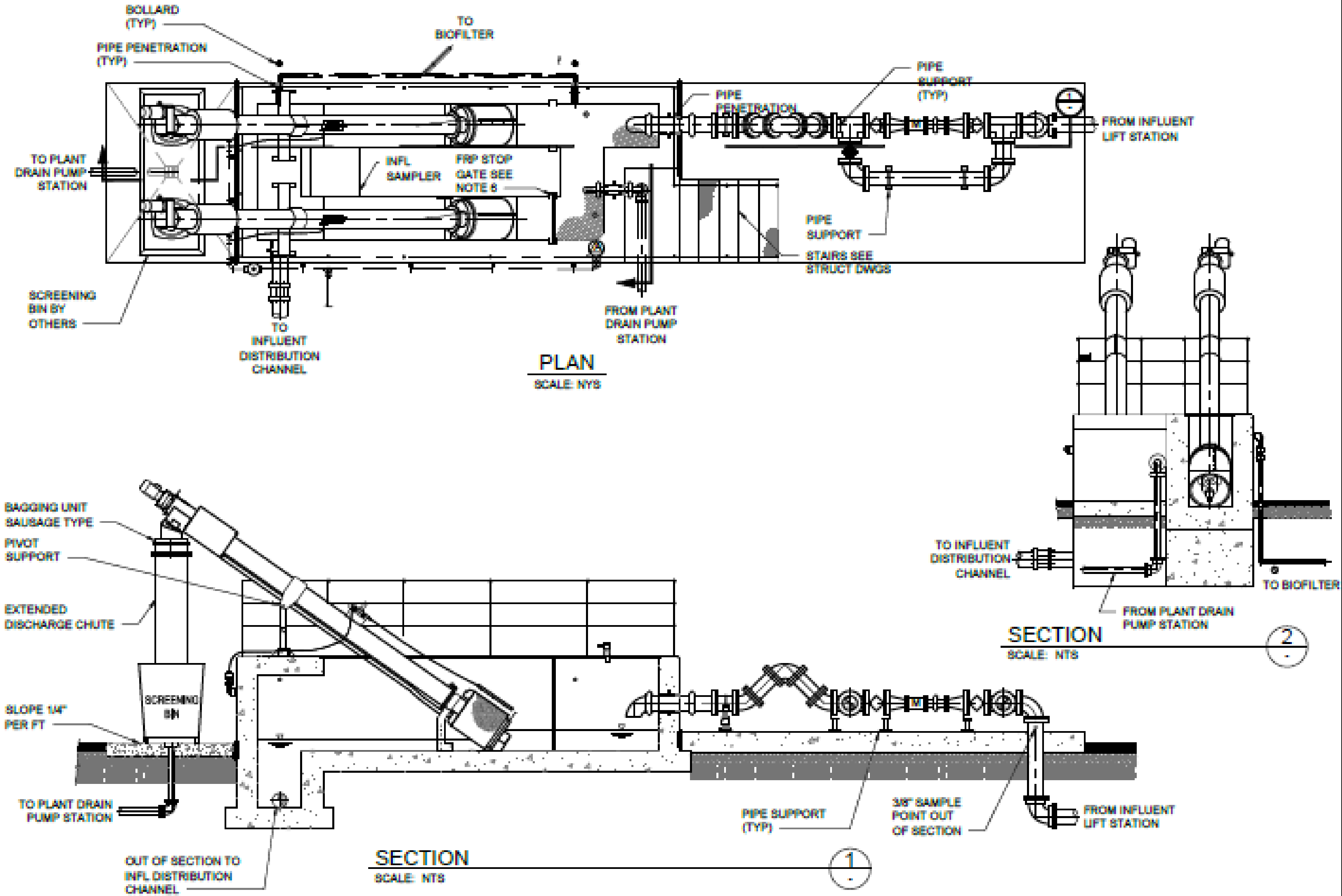

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Figure 5-6
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Typical Headworks Facility

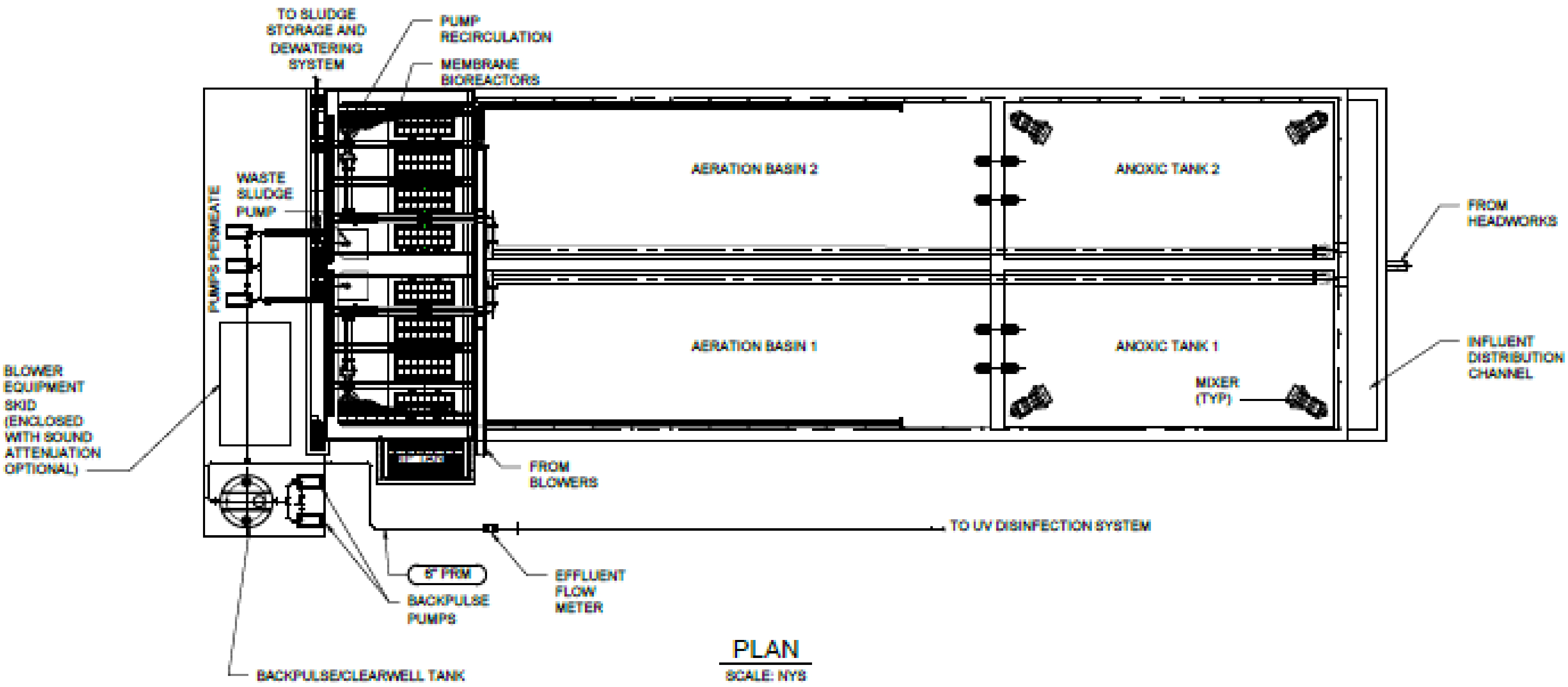

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Figure 5-7
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Preliminary Wastewater Treatment Facility Plan

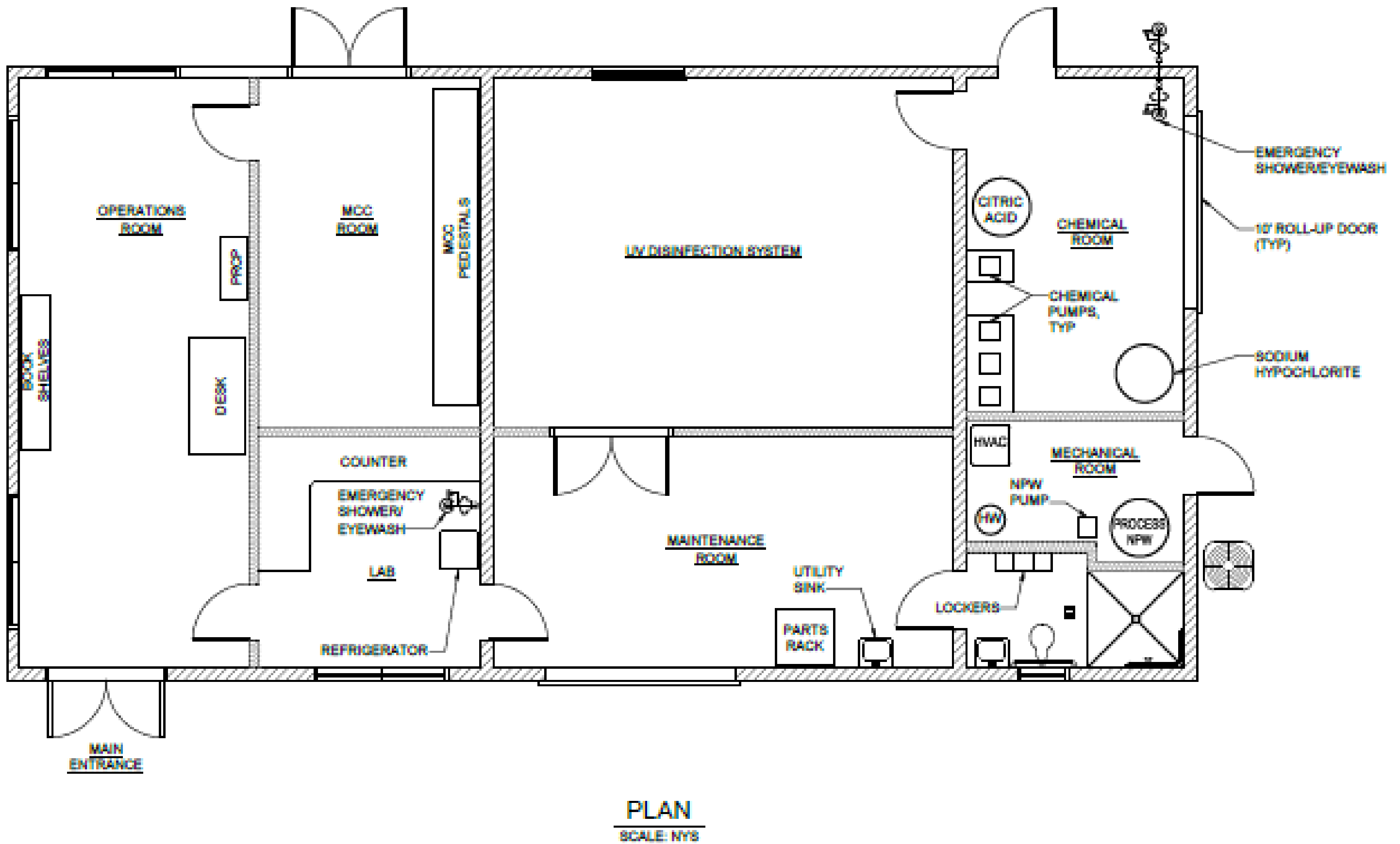

Figure 5-8
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Preliminary Operations Building Floor Plan

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5.3 Recycled Water

The recommended methods for effluent disposal would include maximizing on-site recycled water use including on-site landscape irrigation. It is assumed that recycled water would be supplied primarily to the casino facility for landscape irrigation, toilet and urinal flushing, and cooling tower makeup. Potential off-site options would include providing recycled water to off-site users for irrigation purposes.

The recommended on-site recycled water facilities include a recycled water storage tank. The need for a pump station would be determined based on the location and elevation of the storage tank. The ultimate location of the recycled water facilities will be based on the final design of the Project facilities. All of the recommended facilities described in this section are preliminary and should be utilized for planning purposes only.

5.3.1 On-Site Recycled Water Facilities

In order to maximize recycled water use on-site, it is assumed that the casino building will be dual-plumbed with both potable and recycled water. The primary uses of recycled water will be for toilet and urinal flushing, on-site landscape irrigation, and cooling tower makeup. The on-site recycled water reuse facilities will be designed to ensure that they comply with all USEPA standards (typically deferred to California's Title 22 standards). The required on-site facilities will be identified and designed upon completion of a site plan and preliminary engineering including:

- Recycled water irrigation facilities marked in a purple color.
- Signage informing the public recycled water is used.
- Pipelines in separate trenches a minimum distance away from other water pipelines.
- Labeling of recycled water valves, boxes, and sprinkler heads.

Within the building, the interior plumbing system will have to be plumbed separately from the building's potable water system and contain no cross connections. The dual plumbed piping systems must be distinctly marked and color-coded.

Estimated recycled water generated by the project and demands are provided in **Table 5-5**. Irrigation demand assumes landscaped are is approximately 5 acres for each alternative.

Table 5-5: Recycled Water Generated and Project Demands (Average Year)

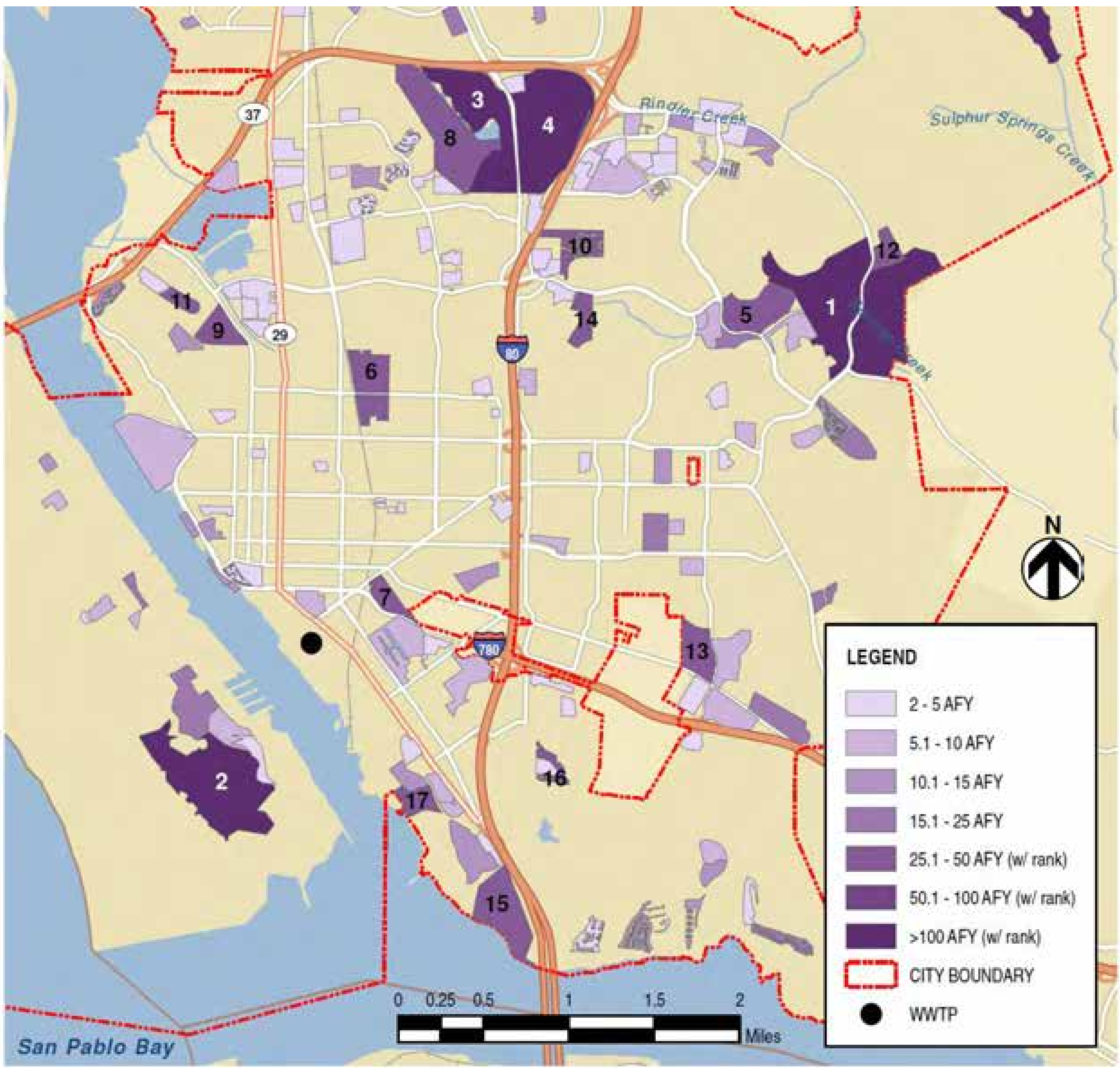
Alternative	RW Generated (AFY)	Dual Plumbed Demand (AFY)	Cooling Demand (AFY)	Landscape Irrigation Demand (AFY)[1]	Excess RW (AFY)
Alternative A	241	62.7	30	12.4	135.9
Alternative B	233	62.7	30	12.4	127.9
Alternative C	70	13.4	6.9	12.4	37.3

Notes:
1. Assuming approximately five acres of landscaped area.

5.3.2 Off-site Recycled Water Opportunities

In 2018, the District prepared a Recycled Water Facilities Plan (RWFP). That plan identified potential recycled water uses and quantified opportunities for recycled water use within the City based on the most cost-effective users. In that analysis, the Blue Rock Springs Golf Club was identified as one of the top potential recycled water users with a demand potential greater than 100 AFY. That site is located along Columbus Parkway, less than two miles southeast of the Project (noted with a “1” in the figure). **Figure 5-9** shows the potential recycled water demands from the RWFP. Blue Rock Springs is irrigated with approximately 500 AFY of untreated raw water provided by the City. There are several water features within the golf club; it is presumed that irrigation water is stored within these and that they could be augmented with recycled water to provide seasonal storage.

Figure 5-9: Potential Recycled Water Demands (VFWD, 2018)

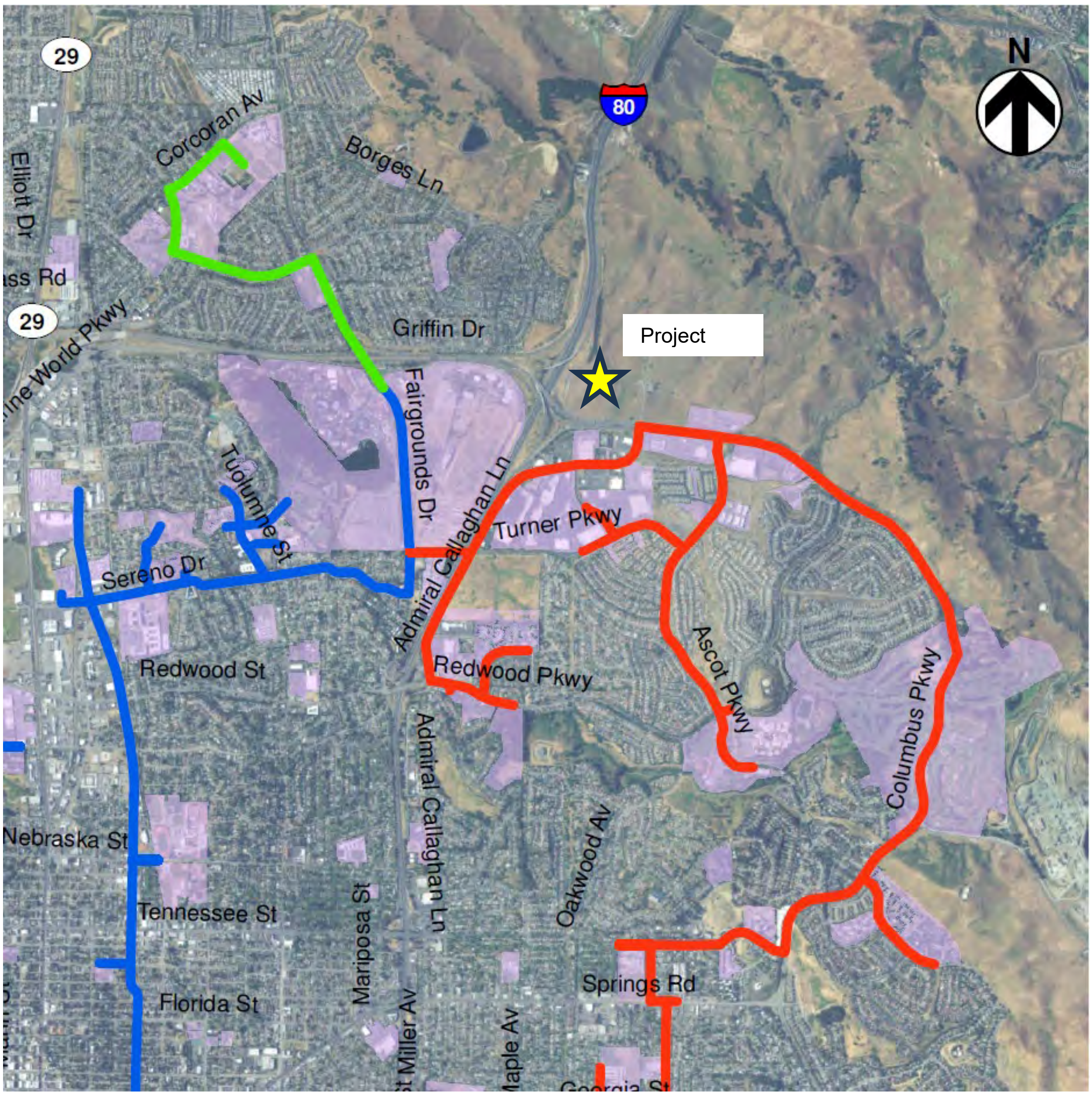


Source: Recycled Water Facilities Plan, VFWD, March 2018, Figure 6-1

A conceptual alignment was identified along Columbus Parkway to serve that site, which also fronts the Project site. **Figure 5-10** shows those conceptual alignments identified in the RWFP.

For an on-site WWTP alternative, it is recommended that the opportunity to develop a recycled water distribution system be explored with the City and District. Augmenting their water supply with recycled water can offset the use of raw water provided by the City. The RWFP is included as **Appendix F**.

Figure 5-10: Conceptual Recycled Water Alignments (VFWD, 2018)



Source: Recycled Water Facilities Plan, VFWD, March 2018, Figure 10-1

5.3.3 Recycled Water Storage Tank and Pump Station

Where seasonal storage and irrigation could be located off-site, the purpose of an onsite recycled water storage tank would be to provide peak day storage for on-site recycled water use for Project toilet and urinal flushing, on-site landscaping (assumed approximately 5 acres), and cooling tower makeup.

This storage tank would be similar to the potable water storage tank with respect to construction methods. A typical section for the tank is shown as **Figure 4-3**. **Table 5-6** shows a summary of the recommended storage tank design criteria assuming the stored recycled water would supply only the Casino facility indoor uses.

Table 5-6: Recycled Water Storage Tank Design Criteria

Parameter	Alternatives A&B	Alternative C
Approximate size	100,000 gallons	50,000 gallons
Approximate diameter	32 feet	24 feet
Approximate height	16 feet	16 feet

The effluent pump station would pump recycled water from the WWTP to the recycled water storage tank. A recycled water pump station combined with a hydropneumatic tank can be used to supply the distribution system and maintain system pressure. **Table 5-7** shows a summary of the recommended pump station design criteria.

Table 5-7: Recycled Water Pump Station Design Criteria

Parameter	Value
Pump number	2
Pump type	Variable speed turbine
Hydropneumatic tank approximate volume range[1]	500 – 1,000 gallons

Notes:
1. Exact volume is to be determined during the design phase of the project. Tank volume is dependent on the desired flowrate and pressure from the hydropneumatic tank.

5.3.4 On-site Seasonal Storage and Irrigation

The onsite recycled water storage tank and pump station may be sized to provide seasonal storage. Seasonal storage would be designed to store the volume of recycled water generated during the wet season when there is little to no irrigation demand.

A water balance was developed to assess the seasonal storage and disposal requirements assuming a 100-year rainfall followed by an average year. The seasonal storage volume required for the project alternatives along with the recycled water irrigation area needed is provided in **Table 5-8**. This represents the maximum irrigation area to achieve the minimum storage volume. Additional storage volume would reduce the irrigation area necessary. Each alternative considers the use of recycled water for dual-plumbing and cooling. These estimates are preliminary and are for planning purposes only. Copies of the water balances for each alternative are provided as **Appendix G**.

Table 5-8: Estimated Seasonal Storage and Irrigation Requirements

Project Alternative	Irrigation Area[1] (Acres)	Irrigation Demand[2] (AF)	Cooling Tower Makeup Demand (AF)	Dual Plumbing Demand (AF)	Minimum Storage (AF)
Alternative A	194	480	30	63	64.5
Alternative B	185	458	30	63	61.2
Alternative C	64	157	7	13	21.3

Notes:
1. This disposal strategy assumes that all effluent will be disposed to the irrigated areas from April to October and stored in a closed storage tank during the wet season. This represents the maximum area required to minimize storage. Irrigation area can be reduced with increased storage volume.
2. Represents irrigation demand for total irrigated area and may be more than available recycled water generated. Location of irrigation areas are to be determined.

The limiting month at the end of the dry season is the month of November when irrigation demand drops to zero. It is noted that the volume of irrigation water is roughly equivalent to the estimated demand of the Blue Rock Springs Golf Club, which is approximately 500 AFY.

Due to the topography and geological challenges within the Project site, the location and design of open seasonal storage ponds requires further investigation. Closed storage tanks are assumed for planning purposes. Capacity, number, and dimensions are provided in **Table 5-9**.

Table 5-9: Seasonal Recycled Water Storage Tank Capacity and Dimensions

Project Alternative	Max Storage (AF)	Max Storage (MG)	No. of Tanks	Height (ft)	Diameter (ft)
Alternative A	64.5	21	3	40	173
Alternative B	61.2	20	3	40	169
Alternative C	21.3	64	1	40	173

Proposed siting of storage tanks is provided in **Figure 5-11** and **Figure 5-12**.

HydroScience

Figure 5-11
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Alternatives A & B Proposed WTP, WWTP, and RW Storage Site Plan

Figure 5-12
Acorn Environmental
Scotts Valley Rancheria Water and Wastewater Feasibility Study
Alternative C Proposed WTP, WWTP, and RW Storage Site Plan

HydroScience

SECTION 6 – RECOMMENDATIONS

This feasibility study report makes the following preliminary recommendations with respect to the proposed Project.

6.1 Water Supply

As discussed in **Section 2.3.1** and **Appendix B**, there are several water supply limitations identified at the Project site that require further investigation. It is anticipated that connection to the City's municipal water supply system and construction of an on-site water storage tank and pump station will be required for the Project. The configuration of these facilities will be dictated by the feasibility of constructing a recycled water storage tank at a high enough elevation to provide pressure to the system.

6.2 Wastewater Handling

If a District connection is not feasible due to District capacity limitations, then a new WWTP should be constructed on-site to treat wastewater generated on-site. The WWTP would be designed to produce tertiary level recycled water for unrestricted reuse. The Project should maximize the on-site recycling of wastewater and seek off-site disposal options in partnership with the City and District.

The following wastewater handling facilities would be recommended:

- Immersed MBR WWTP with UV Disinfection & Chlorination
- Effluent pump station
- Recycled water storage tank and distribution pump station
- Off-site recycled water disposal

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SECTION 7 – REFERENCES

California Regional Water Quality Control Board – San Francisco Bay Region, Order R2-2023-0001, NPDES Permit CA0037699, Vallejo Flood and Wastewater District, February 8, 2023.

City of Vallejo, 2020 Urban Water Management Plan, October 12, 2021

City of Vallejo, General Plan 2040 Land Use Map, February 11, 2020

City of Vallejo, Revised Standard Specifications and Standard Drawings, December 20, 2011

City of Vallejo, Water Master Plan, August 28, 2015

ENGEO, Inc. Hydrogeologic Assessment, 2024.

ENGEO, Inc. Infiltration Report, 2024.

Vallejo Flood and Wastewater District Engineering Standards, July 2020

Vallejo Flood and Wastewater District, Recycled Water Facilities Plan, March 2018

Vallejo Flood and Wastewater District, Sanitary Sewer Collection System Master Plan, August 2023

Vallejo Flood and Wastewater District, Sewer System Management Plan, Update December 2022

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APPENDIX A

Acorn Environmental

Water and Wastewater Feasibility Study

Projected Water Demands and Wastewater Flows

Project: **Water/Wastewater Feasiblity Study**
Client: **Scotts Valley Rancheria**
Date: **5/8/2024**
Title: **Water Demand and Wastewater Flow Projections**

Element	**Alt A (gpd)**	**Alt B (gpd)**	**Alt C (gpd)**
Wastewater Flow			
Average Day	215,000	208,000	62,000
Peak Day Flow	323,000	312,000	93,000
Peaking Factor	1.5	1.5	1.5
Water Demand			
Average Day	258,000	250,000	74,000
Peak Day Flow	387,000	374,000	111,000
Peaking Factor	1.5	1.5	1.5
Recycled Water Demands / Disposal			
Average Day (Dual Plumbing)	53,000	53,000	12,000
Average Day (Cooling Tower)	27,000	27,000	6,000
Average Day (5.0 acres Landscape)	11,053	11,053	11,053
Net Wastewater Flow			
Average Day	176,947	169,947	44,947
Net Water Demand			
Average Day	205,000	197,000	62,000

Recycled water demand assumed to be 26% of ww inflow to specific facilities (i.e, Casino, hotel, commercial facilities) based on metered data from a similar project. For cooling tower makeup, assumed RW demand 100% of ww inflow for cooling tower.

APPENDIX B

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Water and Wastewater Feasibility Study

ENGEO, Inc. Infiltration Report

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This report summarizes the results of a set of Modified Philip Dunne (MPD) Infiltrometer tests performed at the above referenced site. Engeo San Ramon personnel performed the field tests. The software used to compute saturated hydraulic conductivity (K_{sat}) and generate this report assumes that the field personnel used infiltrometers manufactured by Upstream Technologies Inc. and followed the procedures outlined in “Manual – Modified Philip - Dunne Infiltrometer” by Ahmed, Gulliver, and Nieber.

The following paragraphs describe the individual tests, input values used in the analysis, and methods used to compute the K_{sat} value.

After individual K_{sat} values were calculated, the method used to determine the overall site K_{sat}value ($K_{best\text{-}fit}$) is described in "Effective Saturated Hydraulic Conductivity of an Infiltration-Based Stormwater Control Measure" by Weiss and Gulliver 2015, "A relationship to more consistently and accurately predict the best-fit value of saturated hydraulic conductivity used a weighted sum of 0.32 times the arithmetic mean and 0.68 times the geometric mean."

METHOD USED TO COMPUTE K_{sat}

The MPD Infiltrometer software uses the following procedure described in "The Comparison of Infiltration Devices and Modification of the Philip-Dunne Permeameter for the Assessment of Rain Gardens" by Rebecca Nestigen, University of Minnesota, November 2007.

The steps are as follows:

1. For each measurement of head, use the following equation to find the corresponding distance to the sharp wetting front.

$$[H_0 - H(t)]r_1^2 = \frac{\theta_1 - \theta_2}{3}[2[R(t)]^3 + 3[R(t)]^2 L_{max} - L_{max}^3 - 4r_0^3$$

2. Estimate the change in head with respect to time and the change in wetting front distance with respect to time by using the backward difference for all values of R(t) equal to or greater than the distance

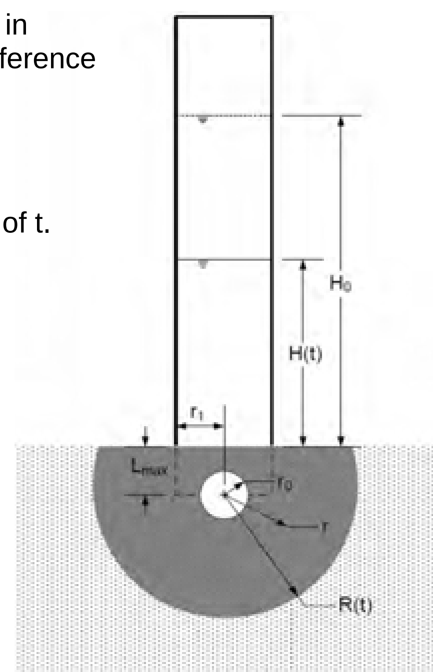
$$\sqrt{r_1^2 + L_{max}^2}$$

3. Make initial guesses for K and C.
4. Solve the following equations for ΔP(t) at each incremental value of t.

$$\Delta P(t) = \frac{\pi^2}{8}\left\{\theta_1 - \theta_0 \frac{[R(t)^2] + [R(t)]L_{max}}{K}\frac{dr}{dt} - 2r_0^2\right\} \frac{ln[\frac{R(t)[r_0+L_{max}]}{r_0[R(t)+L_{max}]}]}{L_{max}}$$

$$\Delta P(t) = C - H(t) - L_{max} + \frac{L_{max}}{K}\frac{dh}{dt}$$

5. Minimize the absolute difference between the two solutions found in Step 4 by adjusting the values of K and C.



Parameters for Equations

Θ_0 = volumetric water content of soil before MPD test

Θ_1 = volumetric water content of soil after MPD test

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1mpd4

Date	4/9/2024
Time	8:24 AM
Latitude	38.137993
Longitude	-122.216017
Initial Volumetric Moisture	10.00 %
Final Volumetric Moisture	50.00 %
Cylinder Size	3 Liter

1mpd4 Results

Map Pin #	1
Test Number	27665
Ksat - mm/hr	79
Ksat - in/hr	3.12
Capillary Pressure C mm	-64.6
RMS Error of Regression	8.9
Normalized RMS	0.3%

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	34.54 cm	26	749 s	24.33 cm	51	1500 s	17.38 cm	76	2250 s	12.11 cm
2	30 s	34.04 cm	27	780 s	24.0 cm	52	1530 s	17.14 cm	77	2279 s	11.91 cm
3	59 s	33.53 cm	28	810 s	23.69 cm	53	1560 s	16.91 cm	78	2310 s	11.73 cm
4	90 s	33.05 cm	29	840 s	23.37 cm	54	1590 s	16.67 cm	79	2339 s	11.54 cm
5	120 s	32.56 cm	30	870 s	23.06 cm	55	1620 s	16.45 cm	80	2370 s	11.36 cm
6	150 s	32.11 cm	31	899 s	22.76 cm	56	1650 s	16.22 cm	81	2400 s	11.18 cm
7	180 s	31.64 cm	32	930 s	22.45 cm	57	1679 s	15.99 cm	82	2429 s	11.0 cm
8	210 s	31.19 cm	33	959 s	22.15 cm	58	1710 s	15.77 cm	83	2460 s	10.82 cm
9	239 s	30.74 cm	34	990 s	21.86 cm	59	1739 s	15.55 cm	84	2489 s	10.65 cm
10	270 s	30.31 cm	35	1019 s	21.57 cm	60	1770 s	15.33 cm	85	2520 s	10.47 cm
11	299 s	29.89 cm	36	1050 s	21.29 cm	61	1799 s	15.12 cm	86	2550 s	10.28 cm
12	330 s	29.48 cm	37	1079 s	21.0 cm	62	1830 s	14.91 cm	87	2579 s	10.11 cm
13	359 s	29.06 cm	38	1110 s	20.72 cm	63	1859 s	14.69 cm	88	2610 s	9.94 cm
14	390 s	28.67 cm	39	1139 s	20.43 cm	64	1890 s	14.48 cm	89	2640 s	9.77 cm
15	419 s	28.27 cm	40	1170 s	20.17 cm	65	1919 s	14.27 cm	90	2669 s	9.6 cm
16	450 s	27.89 cm	41	1200 s	19.89 cm	66	1950 s	14.06 cm	91	2700 s	9.42 cm
17	479 s	27.49 cm	42	1230 s	19.62 cm	67	1979 s	13.86 cm	92	2729 s	9.25 cm
18	510 s	27.12 cm	43	1260 s	19.36 cm	68	2010 s	13.66 cm	93	2759 s	9.09 cm
19	539 s	26.75 cm	44	1290 s	19.11 cm	69	2039 s	13.45 cm	94	2790 s	8.92 cm
20	570 s	26.39 cm	45	1320 s	18.85 cm	70	2070 s	13.26 cm	95	2819 s	8.76 cm
21	600 s	26.02 cm	46	1350 s	18.59 cm	71	2100 s	13.05 cm	96	2849 s	8.59 cm
22	629 s	25.68 cm	47	1380 s	18.35 cm	72	2129 s	12.86 cm	97	2880 s	8.43 cm
23	660 s	25.33 cm	48	1410 s	18.1 cm	73	2160 s	12.67 cm	98	2909 s	8.27 cm
24	689 s	24.99 cm	49	1440 s	17.86 cm	74	2189 s	12.48 cm	99	2939 s	8.11 cm
25	720 s	24.66 cm	50	1470 s	17.61 cm	75	2220 s	12.29 cm	100	2970 s	7.96 cm

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1mpd4 Readings continued

#	Time	Head
101	2999 s	7.8 cm
102	3029 s	7.65 cm
103	3060 s	7.49 cm
104	3089 s	7.33 cm
105	3120 s	7.2 cm
106	3150 s	7.05 cm
107	3179 s	6.89 cm
108	3210 s	6.75 cm
109	3239 s	6.6 cm
110	3270 s	6.46 cm
111	3300 s	6.31 cm
112	3329 s	6.17 cm
113	3360 s	6.03 cm
114	3389 s	5.9 cm
115	3420 s	5.76 cm
116	3450 s	5.61 cm
117	3479 s	5.47 cm
118	3510 s	5.33 cm

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1mpd3

Date	4/9/2024
Time	9:42 AM
Latitude	38.138578
Longitude	-122.215725
Initial Volumetric Moisture	30.00 %
Final Volumetric Moisture	70.00 %
Cylinder Size	3 Liter

1mpd3 Results

Map Pin #	2
Test Number	27669
Ksat - mm/hr	NULL
Ksat - in/hr	NULL
Capillary Pressure C mm	NULL
RMS Error of Regression	NULL
Normalized RMS	NULL

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	36.39 cm	26	748 s	36.53 cm	51	1498 s	36.58 cm	76	2248 s	36.63 cm
2	28 s	36.39 cm	27	778 s	36.53 cm	52	1528 s	36.58 cm	77	2278 s	36.64 cm
3	58 s	36.39 cm	28	808 s	36.54 cm	53	1558 s	36.59 cm	78	2308 s	36.64 cm
4	88 s	36.39 cm	29	838 s	36.54 cm	54	1588 s	36.59 cm	79	2338 s	36.65 cm
5	118 s	36.4 cm	30	868 s	36.55 cm	55	1618 s	36.59 cm	80	2368 s	36.65 cm
6	148 s	36.41 cm	31	898 s	36.55 cm	56	1648 s	36.59 cm	81	2398 s	36.65 cm
7	178 s	36.41 cm	32	928 s	36.55 cm	57	1678 s	36.59 cm	82	2428 s	36.65 cm
8	208 s	36.42 cm	33	958 s	36.55 cm	58	1708 s	36.59 cm	83	2458 s	36.65 cm
9	238 s	36.43 cm	34	988 s	36.55 cm	59	1738 s	36.6 cm	84	2488 s	36.65 cm
10	268 s	36.44 cm	35	1018 s	36.56 cm	60	1768 s	36.6 cm	85	2518 s	36.66 cm
11	298 s	36.44 cm	36	1048 s	36.56 cm	61	1798 s	36.6 cm	86	2548 s	36.66 cm
12	328 s	36.46 cm	37	1078 s	36.56 cm	62	1828 s	36.6 cm	87	2578 s	36.66 cm
13	358 s	36.46 cm	38	1108 s	36.56 cm	63	1858 s	36.61 cm	88	2608 s	36.66 cm
14	388 s	36.47 cm	39	1138 s	36.56 cm	64	1888 s	36.61 cm	89	2638 s	36.66 cm
15	418 s	36.48 cm	40	1168 s	36.56 cm	65	1918 s	36.6 cm	90	2668 s	36.67 cm
16	448 s	36.48 cm	41	1198 s	36.56 cm	66	1948 s	36.61 cm	91	2698 s	36.67 cm
17	478 s	36.49 cm	42	1228 s	36.56 cm	67	1978 s	36.59 cm	92	2728 s	36.67 cm
18	508 s	36.5 cm	43	1258 s	36.56 cm	68	2008 s	36.6 cm	93	2758 s	36.69 cm
19	538 s	36.52 cm	44	1288 s	36.57 cm	69	2038 s	36.61 cm	94	2788 s	36.67 cm
20	568 s	36.52 cm	45	1318 s	36.57 cm	70	2068 s	36.61 cm	95	2818 s	36.69 cm
21	598 s	36.53 cm	46	1348 s	36.57 cm	71	2098 s	36.62 cm	96	2848 s	36.69 cm
22	628 s	36.49 cm	47	1378 s	36.58 cm	72	2128 s	36.62 cm	97	2878 s	36.69 cm
23	658 s	36.5 cm	48	1408 s	36.58 cm	73	2158 s	36.62 cm	98	2908 s	36.69 cm
24	688 s	36.52 cm	49	1438 s	36.58 cm	74	2188 s	36.63 cm	99	2938 s	36.69 cm
25	718 s	36.52 cm	50	1468 s	36.58 cm	75	2218 s	36.63 cm	100	2968 s	36.69 cm

1mpd3 Readings continued

#	Time	Head
101	2998 s	36.7 cm
102	3028 s	36.7 cm
103	3058 s	36.7 cm
104	3088 s	36.69 cm
105	3118 s	36.66 cm
106	3148 s	36.67 cm

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1mpd1

Date	4/9/2024
Time	10:56 AM
Latitude	38.140518
Longitude	-122.215576
Initial Volumetric Moisture	60.00 %
Final Volumetric Moisture	80.00 %
Cylinder Size	3 Liter

1mpd1 Results

Map Pin #	3
Test Number	27670
Ksat - mm/hr	NULL
Ksat - in/hr	NULL
Capillary Pressure C mm	NULL
RMS Error of Regression	NULL
Normalized RMS	NULL

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	29 s	31.47 cm	26	778 s	31.54 cm	51	1529 s	31.64 cm	76	2279 s	31.73 cm
2	58 s	31.47 cm	27	809 s	31.55 cm	52	1559 s	31.64 cm	77	2309 s	31.73 cm
3	89 s	31.49 cm	28	839 s	31.55 cm	53	1588 s	31.64 cm	78	2338 s	31.74 cm
4	118 s	31.48 cm	29	868 s	31.56 cm	54	1619 s	31.64 cm	79	2369 s	31.74 cm
5	149 s	31.49 cm	30	899 s	31.56 cm	55	1648 s	31.65 cm	80	2399 s	31.74 cm
6	178 s	31.5 cm	31	928 s	31.56 cm	56	1679 s	31.65 cm	81	2428 s	31.75 cm
7	209 s	31.5 cm	32	959 s	31.57 cm	57	1709 s	31.66 cm	82	2459 s	31.7 cm
8	238 s	31.51 cm	33	988 s	31.57 cm	58	1738 s	31.66 cm	83	2488 s	31.71 cm
9	269 s	31.46 cm	34	1019 s	31.57 cm	59	1769 s	31.66 cm	84	2519 s	31.71 cm
10	298 s	31.47 cm	35	1049 s	31.58 cm	60	1798 s	31.67 cm	85	2549 s	31.72 cm
11	329 s	31.47 cm	36	1078 s	31.58 cm	61	1829 s	31.67 cm	86	2578 s	31.73 cm
12	358 s	31.48 cm	37	1109 s	31.58 cm	62	1859 s	31.68 cm	87	2609 s	31.74 cm
13	389 s	31.49 cm	38	1138 s	31.59 cm	63	1888 s	31.68 cm	88	2638 s	31.75 cm
14	418 s	31.5 cm	39	1169 s	31.59 cm	64	1919 s	31.69 cm	89	2669 s	31.75 cm
15	449 s	31.51 cm	40	1198 s	31.59 cm	65	1948 s	31.69 cm	90	2699 s	31.77 cm
16	479 s	31.51 cm	41	1229 s	31.59 cm	66	1979 s	31.69 cm	91	2728 s	31.75 cm
17	509 s	31.52 cm	42	1258 s	31.61 cm	67	2009 s	31.7 cm	92	2759 s	31.77 cm
18	539 s	31.52 cm	43	1289 s	31.61 cm	68	2038 s	31.7 cm	93	2788 s	31.77 cm
19	568 s	31.53 cm	44	1319 s	31.61 cm	69	2069 s	31.71 cm	94	2819 s	31.77 cm
20	599 s	31.53 cm	45	1348 s	31.62 cm	70	2098 s	31.71 cm	95	2849 s	31.78 cm
21	628 s	31.53 cm	46	1379 s	31.62 cm	71	2129 s	31.71 cm	96	2878 s	31.78 cm
22	659 s	31.53 cm	47	1408 s	31.62 cm	72	2159 s	31.72 cm	97	2909 s	31.78 cm
23	688 s	31.54 cm	48	1439 s	31.63 cm	73	2188 s	31.72 cm	98	2939 s	31.78 cm
24	719 s	31.54 cm	49	1469 s	31.63 cm	74	2219 s	31.72 cm	99	2968 s	31.78 cm
25	749 s	31.54 cm	50	1498 s	31.63 cm	75	2248 s	31.73 cm	100	2999 s	31.78 cm

1mpd1 Readings continued

#	Time	Head
101	3028 s	31.79 cm

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1mpd5

Date	4/9/2024
Time	12:26 PM
Latitude	38.140563
Longitude	-122.217133
Initial Volumetric Moisture	10.00 %
Final Volumetric Moisture	70.00 %
Cylinder Size	3 Liter

1mpd5 Results

Map Pin #	4
Test Number	27671
Ksat - mm/hr	NULL
Ksat - in/hr	NULL
Capillary Pressure C mm	NULL
RMS Error of Regression	NULL
Normalized RMS	NULL

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	32.37 cm	26	749 s	30.15 cm	51	1499 s	28.31 cm	76	2249 s	26.71 cm
2	29 s	32.15 cm	27	779 s	30.07 cm	52	1529 s	28.24 cm	77	2279 s	26.64 cm
3	59 s	32.03 cm	28	809 s	29.99 cm	53	1559 s	28.18 cm	78	2309 s	26.58 cm
4	89 s	31.91 cm	29	839 s	29.91 cm	54	1589 s	28.11 cm	79	2339 s	26.51 cm
5	119 s	31.82 cm	30	869 s	29.84 cm	55	1619 s	28.05 cm	80	2369 s	26.46 cm
6	149 s	31.72 cm	31	899 s	29.76 cm	56	1649 s	27.97 cm	81	2399 s	26.39 cm
7	179 s	31.63 cm	32	929 s	29.69 cm	57	1679 s	27.91 cm	82	2429 s	26.33 cm
8	209 s	31.54 cm	33	959 s	29.61 cm	58	1709 s	27.85 cm	83	2459 s	26.27 cm
9	239 s	31.46 cm	34	989 s	29.54 cm	59	1739 s	27.78 cm	84	2489 s	26.21 cm
10	269 s	31.38 cm	35	1019 s	29.46 cm	60	1769 s	27.72 cm	85	2519 s	26.14 cm
11	299 s	31.3 cm	36	1049 s	29.39 cm	61	1799 s	27.65 cm	86	2549 s	26.08 cm
12	329 s	31.22 cm	37	1079 s	29.33 cm	62	1829 s	27.6 cm	87	2579 s	26.02 cm
13	359 s	31.14 cm	38	1109 s	29.25 cm	63	1859 s	27.54 cm	88	2609 s	25.96 cm
14	389 s	31.07 cm	39	1139 s	29.18 cm	64	1889 s	27.47 cm	89	2639 s	25.9 cm
15	419 s	31.0 cm	40	1169 s	29.1 cm	65	1919 s	27.42 cm	90	2669 s	25.84 cm
16	449 s	30.92 cm	41	1199 s	29.03 cm	66	1949 s	27.35 cm	91	2699 s	25.79 cm
17	479 s	30.85 cm	42	1229 s	28.96 cm	67	1979 s	27.28 cm	92	2729 s	25.73 cm
18	509 s	30.77 cm	43	1259 s	28.89 cm	68	2009 s	27.22 cm	93	2759 s	25.67 cm
19	539 s	30.69 cm	44	1289 s	28.8 cm	69	2039 s	27.16 cm	94	2789 s	25.61 cm
20	569 s	30.6 cm	45	1319 s	28.74 cm	70	2069 s	27.07 cm	95	2819 s	25.55 cm
21	599 s	30.53 cm	46	1349 s	28.67 cm	71	2099 s	27.02 cm	96	2849 s	25.49 cm
22	629 s	30.46 cm	47	1379 s	28.59 cm	72	2129 s	26.95 cm	97	2879 s	25.43 cm
23	659 s	30.38 cm	48	1409 s	28.52 cm	73	2159 s	26.89 cm	98	2909 s	25.38 cm
24	689 s	30.3 cm	49	1439 s	28.45 cm	74	2189 s	26.82 cm	99	2939 s	25.31 cm
25	719 s	30.22 cm	50	1469 s	28.38 cm	75	2219 s	26.76 cm	100	2969 s	25.25 cm

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1mpd5 Readings continued

#	Time	Head
101	2999 s	25.19 cm
102	3029 s	25.14 cm
103	3059 s	25.08 cm
104	3089 s	25.02 cm
105	3119 s	24.97 cm
106	3149 s	24.91 cm
107	3179 s	24.85 cm
108	3209 s	24.79 cm
109	3239 s	24.74 cm
110	3269 s	24.67 cm
111	3299 s	24.62 cm
112	3329 s	24.57 cm
113	3359 s	24.5 cm
114	3389 s	24.45 cm
115	3419 s	24.4 cm
116	3449 s	24.34 cm
117	3479 s	24.29 cm
118	3509 s	24.22 cm
119	3539 s	24.17 cm
120	3569 s	24.12 cm
121	3599 s	24.07 cm
122	3629 s	24.01 cm
123	3659 s	23.96 cm
124	3689 s	23.89 cm
125	3719 s	23.84 cm
126	3749 s	23.79 cm
127	3779 s	23.74 cm
128	3809 s	23.67 cm
129	3839 s	23.62 cm
130	3869 s	23.56 cm
131	3899 s	23.51 cm
132	3929 s	23.46 cm

#	Time	Head
133	3959 s	23.4 cm
134	3989 s	23.35 cm
135	4019 s	23.3 cm
136	4049 s	23.25 cm
137	4079 s	23.19 cm
138	4109 s	23.14 cm

Infiltration Report

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1mpd2

Date	4/9/2024
Time	1:46 PM
Latitude	38.139652
Longitude	-122.216595
Initial Volumetric Moisture	10.00 %
Final Volumetric Moisture	90.00 %
Cylinder Size	3 Liter

1mpd2 Results

Map Pin #	5
Test Number	27672
Ksat - mm/hr	27
Ksat - in/hr	1.05
Capillary Pressure C mm	-84.2
RMS Error of Regression	1.8
Normalized RMS	0.3%

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	29.75 cm	26	748 s	25.77 cm	51	1498 s	22.67 cm	76	2248 s	19.95 cm
2	28 s	29.52 cm	27	778 s	25.64 cm	52	1528 s	22.55 cm	77	2278 s	19.85 cm
3	58 s	29.3 cm	28	808 s	25.5 cm	53	1558 s	22.45 cm	78	2308 s	19.75 cm
4	88 s	29.11 cm	29	838 s	25.38 cm	54	1588 s	22.33 cm	79	2338 s	19.65 cm
5	118 s	28.92 cm	30	868 s	25.25 cm	55	1618 s	22.22 cm	80	2368 s	19.55 cm
6	148 s	28.74 cm	31	898 s	25.12 cm	56	1648 s	22.11 cm	81	2398 s	19.44 cm
7	178 s	28.56 cm	32	928 s	24.98 cm	57	1678 s	21.99 cm	82	2428 s	19.35 cm
8	208 s	28.39 cm	33	958 s	24.85 cm	58	1708 s	21.88 cm	83	2458 s	19.23 cm
9	238 s	28.24 cm	34	988 s	24.73 cm	59	1738 s	21.76 cm	84	2488 s	19.13 cm
10	268 s	28.09 cm	35	1018 s	24.6 cm	60	1768 s	21.66 cm	85	2518 s	19.03 cm
11	298 s	27.94 cm	36	1048 s	24.47 cm	61	1798 s	21.55 cm	86	2548 s	18.93 cm
12	328 s	27.79 cm	37	1078 s	24.34 cm	62	1828 s	21.43 cm	87	2578 s	18.84 cm
13	358 s	27.65 cm	38	1108 s	24.22 cm	63	1858 s	21.33 cm	88	2608 s	18.73 cm
14	388 s	27.51 cm	39	1138 s	24.11 cm	64	1888 s	21.22 cm	89	2638 s	18.63 cm
15	418 s	27.36 cm	40	1168 s	23.98 cm	65	1918 s	21.12 cm	90	2668 s	18.54 cm
16	448 s	27.22 cm	41	1198 s	23.85 cm	66	1948 s	21.01 cm	91	2698 s	18.44 cm
17	478 s	27.07 cm	42	1228 s	23.74 cm	67	1978 s	20.9 cm	92	2728 s	18.34 cm
18	508 s	26.93 cm	43	1258 s	23.62 cm	68	2008 s	20.8 cm	93	2758 s	18.25 cm
19	538 s	26.78 cm	44	1288 s	23.49 cm	69	2038 s	20.69 cm	94	2788 s	18.14 cm
20	568 s	26.64 cm	45	1318 s	23.37 cm	70	2068 s	20.58 cm	95	2818 s	18.05 cm
21	598 s	26.49 cm	46	1348 s	23.26 cm	71	2098 s	20.48 cm	96	2848 s	17.95 cm
22	628 s	26.34 cm	47	1378 s	23.14 cm	72	2128 s	20.37 cm	97	2878 s	17.85 cm
23	658 s	26.2 cm	48	1408 s	23.02 cm	73	2158 s	20.26 cm	98	2908 s	17.76 cm
24	688 s	26.06 cm	49	1438 s	22.9 cm	74	2188 s	20.16 cm	99	2938 s	17.66 cm
25	718 s	25.92 cm	50	1468 s	22.79 cm	75	2218 s	20.05 cm	100	2968 s	17.57 cm

1mpd2 Readings continued

#	Time	Head
101	2998 s	17.47 cm
102	3028 s	17.37 cm

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1mpd6

Date	4/9/2024
Time	3:19 PM
Latitude	38.146098
Longitude	-122.214913
Initial Volumetric Moisture	30.00 %
Final Volumetric Moisture	80.00 %
Cylinder Size	3 Liter

1mpd6 Results

Map Pin #	6
Test Number	27673
Ksat - mm/hr	NULL
Ksat - in/hr	NULL
Capillary Pressure C mm	NULL
RMS Error of Regression	NULL
Normalized RMS	NULL

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	26.89 cm	26	748 s	25.56 cm	51	1498 s	24.98 cm	76	2248 s	24.38 cm
2	28 s	26.79 cm	27	778 s	25.52 cm	52	1528 s	24.96 cm	77	2278 s	24.36 cm
3	58 s	26.72 cm	28	808 s	25.49 cm	53	1558 s	24.94 cm	78	2308 s	24.34 cm
4	88 s	26.62 cm	29	838 s	25.47 cm	54	1588 s	24.92 cm	79	2338 s	24.31 cm
5	118 s	26.54 cm	30	868 s	25.44 cm	55	1618 s	24.9 cm	80	2368 s	24.29 cm
6	148 s	26.45 cm	31	898 s	25.42 cm	56	1648 s	24.89 cm	81	2398 s	24.26 cm
7	178 s	26.37 cm	32	928 s	25.39 cm	57	1678 s	24.86 cm	82	2428 s	24.24 cm
8	208 s	26.29 cm	33	958 s	25.36 cm	58	1708 s	24.84 cm	83	2458 s	24.21 cm
9	238 s	26.24 cm	34	988 s	25.33 cm	59	1738 s	24.82 cm	84	2488 s	24.19 cm
10	268 s	26.17 cm	35	1018 s	25.31 cm	60	1768 s	24.81 cm	85	2518 s	24.18 cm
11	298 s	26.13 cm	36	1048 s	25.29 cm	61	1798 s	24.79 cm	86	2548 s	24.14 cm
12	328 s	26.06 cm	37	1078 s	25.27 cm	62	1828 s	24.76 cm	87	2578 s	24.11 cm
13	358 s	26.02 cm	38	1108 s	25.25 cm	63	1858 s	24.75 cm	88	2608 s	24.09 cm
14	388 s	25.99 cm	39	1138 s	25.22 cm	64	1888 s	24.73 cm	89	2638 s	24.07 cm
15	418 s	25.95 cm	40	1168 s	25.2 cm	65	1918 s	24.71 cm	90	2668 s	24.04 cm
16	448 s	25.91 cm	41	1198 s	25.18 cm	66	1948 s	24.69 cm	91	2698 s	24.02 cm
17	478 s	25.88 cm	42	1228 s	25.16 cm	67	1978 s	24.67 cm	92	2728 s	24.0 cm
18	508 s	25.83 cm	43	1258 s	25.14 cm	68	2008 s	24.65 cm	93	2758 s	23.98 cm
19	538 s	25.8 cm	44	1288 s	25.12 cm	69	2038 s	24.63 cm	94	2788 s	23.95 cm
20	568 s	25.76 cm	45	1318 s	25.1 cm	70	2068 s	24.58 cm	95	2818 s	23.93 cm
21	598 s	25.73 cm	46	1348 s	25.08 cm	71	2098 s	24.53 cm	96	2848 s	23.91 cm
22	628 s	25.68 cm	47	1378 s	25.06 cm	72	2128 s	24.5 cm	97	2878 s	23.88 cm
23	658 s	25.65 cm	48	1408 s	25.03 cm	73	2158 s	24.47 cm	98	2908 s	23.86 cm
24	688 s	25.62 cm	49	1438 s	25.01 cm	74	2188 s	24.44 cm	99	2938 s	23.83 cm
25	718 s	25.59 cm	50	1468 s	25.0 cm	75	2218 s	24.42 cm	100	2968 s	23.82 cm

Infiltration Report

Engeo San Ramon

Scott's Valley - 16484.000.001 - Vallejo, CA

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1mpd6 Readings continued

#	Time	Head	#	Time	Head
101	2998 s	23.8 cm	133	3958 s	23.46 cm
102	3028 s	23.78 cm	134	3988 s	23.43 cm
103	3058 s	23.76 cm	135	4018 s	23.42 cm
104	3088 s	23.74 cm	136	4048 s	23.4 cm
105	3118 s	23.71 cm	137	4078 s	23.38 cm
106	3148 s	23.69 cm	138	4108 s	23.35 cm
107	3178 s	23.67 cm	139	4138 s	23.34 cm
108	3208 s	23.66 cm	140	4168 s	23.33 cm
109	3238 s	23.63 cm	141	4198 s	23.31 cm
110	3268 s	23.62 cm	142	4228 s	23.29 cm
111	3298 s	23.6 cm	143	4258 s	23.28 cm
112	3328 s	23.58 cm	144	4288 s	23.26 cm
113	3358 s	23.65 cm	145	4318 s	23.25 cm
114	3388 s	23.65 cm	146	4348 s	23.22 cm
115	3418 s	23.66 cm	147	4378 s	23.2 cm
116	3448 s	23.66 cm	148	4408 s	23.17 cm
117	3478 s	23.66 cm	149	4438 s	23.14 cm
118	3508 s	23.65 cm	150	4468 s	23.11 cm
119	3538 s	23.64 cm	151	4498 s	23.07 cm
120	3568 s	23.63 cm	152	4528 s	23.03 cm
121	3598 s	23.61 cm	153	4558 s	23.0 cm
122	3628 s	23.6 cm	154	4588 s	22.98 cm
123	3658 s	23.61 cm	155	4618 s	22.95 cm
124	3688 s	23.61 cm	156	4648 s	22.91 cm
125	3718 s	23.59 cm	157	4678 s	22.89 cm
126	3748 s	23.58 cm	158	4708 s	22.84 cm
127	3778 s	23.55 cm	159	4738 s	22.8 cm
128	3808 s	23.54 cm			
129	3838 s	23.53 cm			
130	3868 s	23.51 cm			
131	3898 s	23.49 cm			
132	3928 s	23.47 cm			

APPENDIX C

Acorn Environmental
Water and Wastewater Feasibility Study
ENGEO, Inc. Hydrogeologic Assessment

Project No.
16484.000.001

May 2, 2024

Ms. Bibiana Sparks
Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762

Subject: Scotts Valley Development
Admiral Callaghan Lane and Columbus Parkway
Vallejo, California

HYDROGEOLOGIC ASSESSMENT

Dear Ms. Sparks:

At your request, we have prepared this hydrogeologic assessment for the Scotts Valley Development in Vallejo, California. The purpose of this report is to assess the existing sources of groundwater at the site for potential use within the project.

Our scope of services included the following items.

- Research and review of relevant and available data for the site, including:
  - published geologic maps,
  - groundwater reports prepared by California Department of Water Resources (DWR),
  - available well records and reports from DWR and local agencies, and
  - published Caltrans records of Hunter Hill Landslide and associated drainage gallery.
- Characterization of surface and subsurface geology based on site exploration and published geologic maps
- Field reconnaissance of springs
- Preparation of this report

DOCUMENT REVIEW

Hunter Hill Landslide

An existing landslide, called the Hunter Hill landslide, is located on the northwestern portion of the site. The landslide crosses Interstate 80 (I-80), and is estimated to be approximately 1,300 feet long, 600 feet wide, and approximately 60 feet deep. Ongoing roadway distress has been documented due to continued movement of the landslide. Inclinometers installed by Caltrans near the slide showed movement below I-80 at approximately 30 feet below the roadway surface between 2003 and 2005 (Caltrans, 2005).

According to documentation by Caltrans, a vertical drainage gallery was partially constructed in 1990 through the existing landslide above I-80 in order to reduce water pressures in the landslide, at the approximate location shown in Exhibit 1. The drainage gallery was to consist of vertical sand drains 3 feet in diameter, approximately 53 feet deep, and spaced at 6 feet on-center, interconnected at the bottom by overlapping bells. The gallery was intended to be drained to the southwest under I-80 by a horizontal perforated pipe (Caltrans, 1988).

We did not observe the drainage gallery during our site reconnaissance. According to Caltrans documentation, the bottom drain from the drainage gallery was never completed due to the presence of hard rock and difficult drilling conditions. Additionally, the final constructed depth and extents of the vertical wells is not known since construction was terminated before project completion (Caltrans 1990a, 1990b). Therefore, an elevated water table may still be present in this area of the slide. Groundwater depth fluctuates between approximately 10 and 14 feet below ground surface near the gallery (Caltrans, 2005).

Existing Wells

Based on our review of the available DWR Well Completion Report (WCR) database, no groundwater wells were identified on the site or within a ½ mile radius of the site.

Napa-Sonoma Lowlands Subbasin

The site is located in upland bedrock terrain and outside of a designated groundwater basin. The site lies about $^1/_3$ mile east of the eastern boundary of the Napa-Sonoma Lowlands Groundwater Subbasin. The typical “water bearing formations” in the basin include Holocene and Pleistocene Alluvium, and Pleistocene Huichica Formation. We encountered Pleistocene alluvium and colluvium during our explorations to depths of up to 13 feet. The local groundwater conditions at the site would be characterized as fractured bedrock with an unknown water-bearing capacity within the Great Valley Sequence and silica-carbonate rock.

GEOLOGY

Our hydrogeologic characterization is based on our preliminary geotechnical exploration at the site. Geologic units encountered during our exploration include:

- **Artificial fill (af)** – In our explorations, artificial fill consists of bedrock-derived sand and gravel mixed with clay.
- **Alluvium and colluvium, undivided (Qa, Qc)** – Holocene and late Pleistocene deposits. In our explorations, this material generally consists of sandy and gravelly stiff to very stiff clay, with local lenses of increased sand and gravel fractions underlying surficial clay deposits.
- **Landslide Deposits (Qls)** – Holocene and Pleistocene deposits. Deposits near the north landslide (Hunter Hill Landslide) consisted primarily of gravelly lean clay and highly sheared shale and sandstone. Deposits near the south landslide consisted of sheared shale and mudstone in a clay matrix.
- **Great Valley Sequence (Kgv)** – Cretaceous age sandstone, siltstone, shale, and minor conglomerates. On the project site, this unit predominantly consists of siltstone and shale with minor sandstone.
- **Silica-Carbonate Rock (sc)** – Part of the Jurassic-age Coast Range Ophiolite sequence, which contains basalt, gabbro, and serpentinite. Serpentinite locally contains pyroxenite and silica-carbonate rock.

GROUNDWATER

During our field exploration, we encountered groundwater in one of our borings (1-B2) at a depth of 14 feet below the existing ground surface within Great Valley Sequence rock. Water was not encountered in Boring 1-B3 to final depth of the boring (60 feet). The depth to groundwater was not identified in Boring 1-B1 due to the drilling methods used. We also observed surface water flowing in small streams at the locations shown in blue in Exhibit 1. Reports from Caltrans indicate that groundwater depths near the drainage gallery (shown in Exhibit 1) fluctuate seasonally between approximately 10 to 14 feet (Caltrans, 2005).

Fluctuations in the level of groundwater may occur due to variations in rainfall, irrigation practice, and other factors not evident at the time measurements were made.

FIELD RECONNAISSANCE OF SPRINGS

Four springs are present on or near the project site, as shown in Exhibit 1 – Site Plan. During our field exploration between April 22 and April 25, 2024, we performed a reconnaissance of the springs to assess their current condition. In a channel flowing from the easternmost spring, we estimated flow rates at three locations that ranged from ¼ gallon per minute (gpm) to 2½ gpm. Additionally, we observed water flowing from a culvert out of the southernmost spring at a rate of approximately 3 gpm. We consider these field estimates to be preliminary, and not representative of the total flow from the springs.

We also reviewed aerial imagery available on Google Earth from 1993 to 2023 to understand and estimate the seasonal fluctuation in flow from the springs. The streams are generally more active during winter and spring months and have a reduced vegetated area during summer and fall months, especially during drought years. Dry or drought conditions are evident in aerial imagery from May 2022, September 2010, and July 1993, as shown in Appendix A.

EXHIBIT 1: Site Plan

CONCLUSIONS

Water sources present on the site include surface water, four springs located along the boundaries of existing landslides and at geologic contacts, groundwater within alluvium and colluvium soil layers, and groundwater within fractured bedrock.

We note the following considerations regarding using water from these sources.

- Groundwater supply wells are not located on the project site or nearby. Our research did not identify previous well pump tests conducted in either soil or rock units on or near the site. It is also not known whether fractures throughout the Great Valley rock and silica-carbonate rock will provide sufficient flow to develop groundwater supply wells. Therefore, the potential yield of these materials is uncertain.
- The output from the springs is not known, although seasonal fluctuation and drought periods will result in reduced spring flow.
- The depth of colluvium and alluvium at the site is variable. In our explorations, we identified colluvium/alluvium thicknesses ranging from 3 to 13 feet, with alluvium and colluvium deposits covering approximately one quarter of the site. The lateral continuity or presence of groundwater in these deposits is unknown.
- Colluvium contains high concentrations of clay which may result in low yield conditions. We did not encounter continuous layers of sand or gravel in our explorations.
- Historical mercury mining operations were present at multiple locations near the site, including St. John's Mine located less than 1 mile northeast of the site. We consider it feasible that groundwater from both upper soil units and deeper bedrock in this area may be contaminated with heavy metals due to the historical mining operations and possible flow of water through rocks containing heavy metals.

If you have any questions or comments regarding this letter, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

Anne Robertson, PE

James Thurber, CEG

awr/jet/ca

Attachments: Selected References
Appendix A

SELECTED REFERENCES

1. California Department of Water Resources (DWR). 2024. Online System for Well Completion Reports.

2. Caltrans. 2005. Memorandum: Geotechnical Recommendation for Roadway Rehab Project, File No. 04-SOL-80, KP 6.3-13.0/PM 3.9-8.1.

3. Caltrans. 1990a. Memorandum: Results of Field Investigation and Decision regarding Future of Project, File No. 10-339203, 10-SOL-80, PM 6.3.

4. Caltrans. 1990b. Memorandum: Field Investigation for Redesign of Project, File No. 10-339203, 10-SOL-80, PM 6.4.

5. Caltrans. 1988. Memorandum: Seismic Investigation of the Hunter Hill Slide near Vallejo, File No. 10-5S6000, 10-SOL-80-6.0.

6. California Department of Water Resources (DWR). 2014. Bulletin 118, Napa-Sonoma Valley groundwater Basin, Napa-Sonoma Lowlands Subbasin.

APPENDIX A

APPENDIX A

AERIAL PHOTO REVIEW

PHOTO A-1: Google Earth Imagery, August 2023, Summer Conditions Following Historical Winter and Spring Rainfall

PHOTO A-2: Google Earth Imagery, May 2023, Spring Conditions Following Historical Rainfall

PHOTO A-3: Google Earth Imagery, May 2022, Spring Conditions Following 10+ Year Drought

PHOTO A-4: Google Earth Imagery, October 2020, Fall Conditions Following Second Driest October on Record in California and 8+ Year Drought

PHOTO A-5: Google Earth Imagery, September 2018, Fall Conditions Following Sixth Driest September on Record in California

PHOTO A-6: Google Earth Imagery, August 2014, Summer Conditions after a Severely Dry Month, and at Beginning of Exceptional Drought Levels

PHOTO A-7: Google Earth Imagery, September 2010, Fall Conditions Following 3+ Year Drought

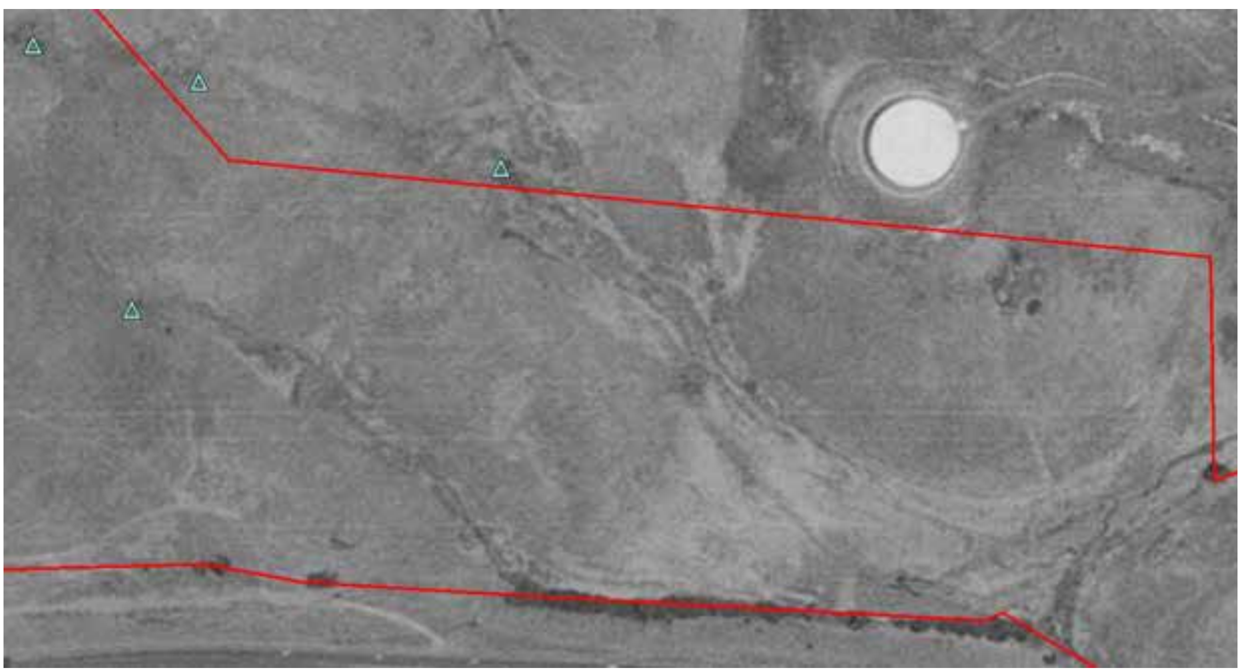
PHOTO A-8: Google Earth Imagery, May 2008, Summer Conditions Following One Year of Extreme Drought

PHOTO A-9: Google Earth Imagery, August 2004, Summer Conditions Following 3+ Year Drought

PHOTO A-10: Google Earth Imagery, July 2003, Summer Conditions Amid Extreme Drought

PHOTO A-11: Google Earth Imagery, July 2002, Summer Conditions Amid Extreme Drought

PHOTO A-12: Google Earth Imagery, July 1993, Summer Conditions Following 6+ Year Drought from 1986 to 1992



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APPENDIX D

Acorn Environmental

Water and Wastewater Feasibility Study

City of Vallejo Standard Specifications and Standard Drawings

[MICROSOFT WORD - 20110913 COV STD SPECS.DOCX (CITYOFVALLEJO.NET)]

APPENDIX E
Acorn Environmental
Water and Wastewater Feasibility Study
Vallejo Flood and Wastewater District Engineering Standards

ENGINEERING-DESIGN-STANDARDS---COMBINED-PDF (VALLEJOWASTEWATER.ORG)

APPENDIX F

Acorn Environmental

Water and Wastewater Feasibility Study

Vallejo Flood and Wastewater District

Recycled Water Facilities Plan

[RECYCLED-WATER-FACILITIES-PLAN-2018 (VALLEJOWASTEWATER.ORG)]

APPENDIX G
Acorn Environmental
Water and Wastewater Feasibility Study
Project Alternative Water Balances

Water Balance - Scotts Valley Feasibility Study - Proposed (Alternative A)

Scenario: Alternative A - Option 1

May 2024   By: Jory Benitez/Angela Singer, HydroScience

Legend
INPUT
INPUT-Adjust as necessary
OUTPUT-Max Elevation

WASTEWATER INFLUENT FLOW			OTHER INPUTS			RECYCLED WATER DISTRIBUTION AND DISPOSAL ALTERNATIVES[2]					
Daily Average Wastewater Influent Flow	215,000	gpd	100-YR Multiplier	1.81	unitless	Landscape Irrigation	63.5	acres	Landscpe Irrig (TBD)	0.0	acres
I/I (PWWF-PDWF)	-	gpd	Pan Evap Coefficient	0.75	unitless	Dual Plumbing	20.4	MG			

100-YEAR ANNUAL PRECIPITATION RETURN PERIOD

	Units	October	November	December	January	February	March	April	May	June	July	August	September	Water Year
No. Days		31	30	31	31	28	31	30	31	30	31	31	30	
CLIMATE INPUTS														
Precipitation	in	1.83	4.43	10.29	10.07	9.33	6.11	2.23	1.42	0.40	0.00	0.11	0.24	46.45
Pan Evaporation	in	5.72	2.48	1.66	1.53	2.15	3.79	5.82	8.90	11.00	13.22	12.06	8.67	77.00
Effective Water Surface Evaporation	in	4.29	1.40	0.93	0.86	1.21	2.13	4.37	6.68	8.25	9.92	9.05	6.50	55.57
WASTEWATER GENERATION														
Facility Wastewater Influent (ADWF)	MG	6.7	6.5	6.7	6.7	6.0	6.7	6.5	6.7	6.5	6.7	6.7	6.5	78.5
I/I Contributions	MG	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.1
TOTAL Wastewater Influent	ac-ft	20.5	19.8	20.5	20.5	18.5	20.5	19.8	20.5	19.8	20.5	20.5	19.8	241.1
WWTP CONTRIBUTIONS														
Site Run-off	ac-ft	0.0	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Cooling Tower Blowdown	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower Evaporation/Drift Loss	ac-ft	-0.04	-0.03	-0.03	-0.03	-0.03	-0.03	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.4
RECYCLED WATER DISTRIBUTION														
Dual Plumbing	ac-ft	-5.3	-5.2	-5.3	-5.3	-4.8	-5.3	-5.2	-5.3	-5.2	-5.3	-5.3	-5.2	-62.7
Cooling Tower	ac-ft	-2.5	-2.0	-2.0	-2.0	-1.8	-2.0	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-27.5
Landscape Irrigation (Casino)	ac-ft	-5.0	0.0	0.0	0.0	0.0	0.0	-4.0	-17.4	-29.7	-31.9	-29.1	-21.7	-138.8
Landscape Irrigation (TBD)	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAW WATER MAKE-UP														
Blend Raw Water[1]	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MONTHLY STORAGE BALANCE														
Beginning Storage Volume	ac-ft	0.0	7.6	20.3	33.6	46.9	58.9	72.1	80.3	75.5	58.0	38.6	22.0	
Change in Water Volume	ac-ft	7.6	12.8	13.3	13.3	12.0	13.2	8.2	-4.8	-17.5	-19.4	-16.6	-9.6	
Final Storage Volume	ac-ft	7.6	20.3	33.6	46.9	58.9	72.1	80.3	75.5	58.0	38.6	22.0	12.5	

Maximum Seasonal Storage (ac-ft) **80.3**
mg **26.2**

AVERAGE ANNUAL PRECIPITATION RETURN PERIOD

	Units	October	November	December	January	February	March	April	May	June	July	August	September	Water Year
No. Days		31	30	31	31	28	31	30	31	30	31	31	30	
CLIMATE INPUTS														
Precipitation	in	1.01	2.44	5.67	5.55	5.14	3.37	1.23	0.78	0.22	0.00	0.06	0.13	25.60
Pan Evaporation	in	5.72	2.48	1.66	1.53	2.15	3.79	5.82	8.90	11.00	13.22	12.06	8.67	77.00
Effective Water Surface Evaporation	in	4.29	1.86	1.25	1.15	1.61	2.84	4.37	6.68	8.25	9.92	9.05	6.50	57.75
WASTEWATER GENERATION														
Facility Wastewater Influent (ADWF)	MG	6.7	6.5	6.7	6.7	6.0	6.7	6.5	6.7	6.5	6.7	6.7	6.5	78.5
I/I Contributions	MG	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.1
TOTAL Wastewater Influent	ac-ft	20.5	19.8	20.5	20.5	18.5	20.5	19.8	20.5	19.8	20.5	20.5	19.8	241.1
WWTP CONTRIBUTIONS														
Site Run-off	ac-ft	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Cooling Tower Blowdown	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower Evaporation/Drift Loss	ac-ft	-0.04	-0.04	-0.04	-0.04	-0.03	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.4
RECYCLED WATER DISTRIBUTION														
Dual Plumbing	ac-ft	-5.3	-5.2	-5.3	-5.3	-4.8	-5.3	-5.2	-5.3	-5.2	-5.3	-5.3	-5.2	-62.7
Cooling Tower	ac-ft	-2.5	-2.5	-2.5	-2.5	-2.3	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-30.0
Landscape Irrigation (Casino)	ac-ft	-10.4	0.0	0.0	0.0	0.0	0.0	-10.6	-21.6	-30.8	-31.9	-29.4	-22.4	-157.2
Landscape Irrigation (TBD)	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAW WATER MAKE-UP														
Blend Raw Water[1]	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MONTHLY STORAGE BALANCE														
Beginning Storage Volume	ac-ft	12.5	14.6	26.8	39.5	52.2	63.6	76.3	77.9	68.9	50.2	30.8	13.9	
Change in Water Volume	ac-ft	2.1	12.2	12.7	12.7	11.5	12.6	1.6	-9.0	-18.7	-19.4	-16.9	-10.3	
Final Storage Volume	ac-ft	14.6	26.8	39.5	52.2	63.6	76.3	77.9	68.9	50.2	30.8	13.9	3.6	

Maximum Seasonal Storage (ac-ft) **77.9**
mg **25.4**

Note:
1. Blend Raw Water is the deficit in ww flow generated to meet recycled water demands, to resolve then less water would be discharged for irrigation.
2. Assumed all equipment open basin/tankage would include covers and won't contribute to ww flows, confirm as more information becomes available.
3. Cooling tower blowdown is estimated at 10% of daily water demand and is included in the facility wastewater influent projection.
4. Cooling tower evaporation loss estimated at 1.5% of monthly water demand.

Water Balance - Scotts Valley Feasibility Study - Proposed (Alternative B)

Scenario: Alternative B - Option 1

May 2024 By: Jory Benitez/Angela Singer, HydroScience

INPUT
INPUT-Adjust as necessary
OUTPUT-Max Elevation

WASTEWATER INFLUENT FLOW			OTHER INPUTS			RECYCLED WATER DISTRIBUTION AND DISPOSAL ALTERNATIVES[2]					
Daily Average Wastewater Influent Flow	208,000	gpd	100-YR Multiplier	1.81	unitless	Landscape Irrigation	65.0	acres	Landscpe Irrig (TBD)	0.0	acres
I/I (PWWF-PDWF)	-	gpd	Pan Evap Coefficient	0.75	unitless	Dual Plumbing	20.4	MG			

100-YEAR ANNUAL PRECIPITATION RETURN PERIOD

	Units	October	November	December	January	February	March	April	May	June	July	August	September	Water Year
No. Days		31	30	31	31	28	31	30	31	30	31	31	30	
CLIMATE INPUTS														
Precipitation	in	1.83	4.43	10.29	10.07	9.33	6.11	2.23	1.42	0.40	0.00	0.11	0.24	46.45
Pan Evaporation	in	5.72	2.48	1.66	1.53	2.15	3.79	5.82	8.90	11.00	13.22	12.06	8.67	77.00
Effective Water Surface Evaporation	in	4.29	1.40	0.93	0.86	1.21	2.13	4.37	6.68	8.25	9.92	9.05	6.50	55.57
WASTEWATER GENERATION														
Facility Wastewater Influent (ADWF)	MG	6.4	6.2	6.4	6.4	5.8	6.4	6.2	6.4	6.2	6.4	6.4	6.2	75.9
I/I Contributions	MG	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.1
TOTAL Wastewater Influent	ac-ft	19.8	19.2	19.8	19.8	17.9	19.8	19.2	19.8	19.2	19.8	19.8	19.2	233.2
WWTP CONTRIBUTIONS														
Site Run-off	ac-ft	0.0	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Cooling Tower Blowdown	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower Evaporation/Drift Loss	ac-ft	-0.04	-0.03	-0.03	-0.03	-0.03	-0.03	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.4
RECYCLED WATER DISTRIBUTION														
Dual Plumbing	ac-ft	-5.3	-5.2	-5.3	-5.3	-4.8	-5.3	-5.2	-5.3	-5.2	-5.3	-5.3	-5.2	-62.7
Cooling Tower	ac-ft	-2.5	-2.0	-2.0	-2.0	-1.8	-2.0	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-27.5
Landscape Irrigation (Casino)	ac-ft	-5.1	0.0	0.0	0.0	0.0	0.0	-4.1	-17.8	-30.4	-32.7	-29.8	-22.2	-142.1
Landscape Irrigation (TBD)	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAW WATER MAKE-UP														
Blend Raw Water[1]	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MONTHLY STORAGE BALANCE														
Beginning Storage Volume	ac-ft	0.0	6.8	18.9	31.5	44.1	55.5	68.1	75.5	69.7	50.8	30.0	12.1	
Change in Water Volume	ac-ft	6.8	12.1	12.6	12.6	11.4	12.5	7.5	-5.9	-18.9	-20.8	-17.9	-10.7	
Final Storage Volume	ac-ft	6.8	18.9	31.5	44.1	55.5	68.1	75.5	69.7	50.8	30.0	12.1	1.3	

Maximum Seasonal Storage (ac-ft) **75.5**
mg **24.6**

AVERAGE ANNUAL PRECIPITATION RETURN PERIOD

	Units	October	November	December	January	February	March	April	May	June	July	August	September	Water Year
No. Days		31	30	31	31	28	31	30	31	30	31	31	30	
CLIMATE INPUTS														
Precipitation	in	1.01	2.44	5.67	5.55	5.14	3.37	1.23	0.78	0.22	0.00	0.06	0.13	25.60
Pan Evaporation	in	5.72	2.48	1.66	1.53	2.15	3.79	5.82	8.90	11.00	13.22	12.06	8.67	77.00
Effective Water Surface Evaporation	in	4.29	1.86	1.25	1.15	1.61	2.84	4.37	6.68	8.25	9.92	9.05	6.50	57.75
WASTEWATER GENERATION														
Facility Wastewater Influent (ADWF)	MG	6.4	6.2	6.4	6.4	5.8	6.4	6.2	6.4	6.2	6.4	6.4	6.2	75.9
I/I Contributions	MG	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.1
TOTAL Wastewater Influent	ac-ft	19.8	19.2	19.8	19.8	17.9	19.8	19.2	19.8	19.2	19.8	19.8	19.2	233.2
WWTP CONTRIBUTIONS														
Site Run-off	ac-ft	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Cooling Tower Blowdown	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower Evaporation/Drift Loss	ac-ft	-0.04	-0.04	-0.04	-0.04	-0.03	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.4
RECYCLED WATER DISTRIBUTION														
Dual Plumbing	ac-ft	-5.3	-5.2	-5.3	-5.3	-4.8	-5.3	-5.2	-5.3	-5.2	-5.3	-5.3	-5.2	-62.7
Cooling Tower	ac-ft	-2.5	-2.5	-2.5	-2.5	-2.3	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-30.0
Landscape Irrigation (Casino)	ac-ft	-10.7	0.0	0.0	0.0	0.0	0.0	-10.8	-22.1	-31.6	-32.7	-30.1	-22.9	-160.9
Landscape Irrigation (TBD)	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAW WATER MAKE-UP														
Blend Raw Water[1]	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	11.4	
MONTHLY STORAGE BALANCE														
Beginning Storage Volume	ac-ft	1.3	2.6	14.2	26.2	38.2	49.0	61.0	61.7	51.5	31.5	10.6	0.0	
Change in Water Volume	ac-ft	1.2	11.6	12.0	12.0	10.9	12.0	0.7	-10.2	-20.1	-20.8	-10.6	0.0	
Final Storage Volume	ac-ft	2.6	14.2	26.2	38.2	49.0	61.0	61.7	51.5	31.5	10.6	0.0	0.0	

Maximum Seasonal Storage (ac-ft) **61.7**
mg **20.1**

Note:
1. Blend Raw Water is the deficit in ww flow generated to meet recycled water demands, to resolve then less water would be discharged for irrigation.
2. Assumed all equipment open basin/tankage would include covers and won't contribute to ww flows, confirm as more information becomes available.
3. Cooling tower blowdown is estimated at 10% of daily water demand and is included in the facility wastewater influent projection.
4. Cooling tower evaporation loss estimated at 1.5% of monthly water demand.

Water Balance - Scotts Valley Feasibility Study - Proposed (Alternative C)

Scenario: Alternative C - Option 1

May 2024 By: Jory Benitez/Angela Singer, HydroScience

INPUT
INPUT-Adjust as necessary
OUTPUT-Max Elevation

WASTEWATER INFLUENT FLOW			OTHER INPUTS			RECYCLED WATER DISTRIBUTION AND DISPOSAL ALTERNATIVES[2]				
Daily Average Wastewater Influent Flow	62,000	gpd	100-YR Multiplier	1.81	unitless	Landscape Irrigation	50.0	acres	Landscpe Irrig (TBD)	0.0 acres
I/I (PWWF-PDWF)	-	gpd	Pan Evap Coefficient	0.75	unitless	Dual Plumbing	4.4	MG		

100-YEAR ANNUAL PRECIPITATION RETURN PERIOD

	Units	October	November	December	January	February	March	April	May	June	July	August	September	Water Year
No. Days		31	30	31	31	28	31	30	31	30	31	31	30	
CLIMATE INPUTS														
Precipitation	in	1.83	4.43	10.29	10.07	9.33	6.11	2.23	1.42	0.40	0.00	0.11	0.24	46.45
Pan Evaporation	in	5.72	2.48	1.66	1.53	2.15	3.79	5.82	8.90	11.00	13.22	12.06	8.67	77.00
Effective Water Surface Evaporation	in	4.29	1.40	0.93	0.86	1.21	2.13	4.37	6.68	8.25	9.92	9.05	6.50	55.57
WASTEWATER GENERATION														
Facility Wastewater Influent (ADWF)	MG	1.9	1.9	1.9	1.9	1.7	1.9	1.9	1.9	1.9	1.9	1.9	1.9	22.6
I/I Contributions	MG	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.1
TOTAL Wastewater Influent	ac-ft	5.9	5.7	5.9	5.9	5.4	5.9	5.7	5.9	5.7	5.9	5.9	5.7	69.7
WWTP CONTRIBUTIONS														
Site Run-off	ac-ft	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Cooling Tower Blowdown	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower Evaporation/Drift Loss	ac-ft	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.1
RECYCLED WATER DISTRIBUTION														
Dual Plumbing	ac-ft	-1.1	-1.1	-1.1	-1.1	-1.0	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-13.4
Cooling Tower	ac-ft	-0.6	-0.5	-0.5	-0.5	-0.4	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-6.3
Landscape Irrigation (Casino)	ac-ft	-3.9	0.0	0.0	0.0	0.0	0.0	-3.1	-13.7	-23.4	-25.2	-22.9	-17.1	-109.3
Landscape Irrigation (TBD)	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAW WATER MAKE-UP														
Blend Raw Water[1]	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	21.0	18.8	13.1	59.2
MONTHLY STORAGE BALANCE														
Beginning Storage Volume	ac-ft	0.0	0.2	4.4	8.8	13.2	17.2	21.5	22.4	12.9	0.0	0.0	0.0	
Change in Water Volume	ac-ft	0.2	4.2	4.4	4.4	4.0	4.4	0.9	-9.5	-12.9	0.0	0.0	0.0	
Final Storage Volume	ac-ft	0.2	4.4	8.8	13.2	17.2	21.5	22.4	12.9	0.0	0.0	0.0	0.0	

Maximum Seasonal Storage (ac-ft) **22.4**
mg **7.3**

AVERAGE ANNUAL PRECIPITATION RETURN PERIOD

	Units	October	November	December	January	February	March	April	May	June	July	August	September	Water Year
No. Days		31	30	31	31	28	31	30	31	30	31	31	30	
CLIMATE INPUTS														
Precipitation	in	1.01	2.44	5.67	5.55	5.14	3.37	1.23	0.78	0.22	0.00	0.06	0.13	25.60
Pan Evaporation	in	5.72	2.48	1.66	1.53	2.15	3.79	5.82	8.90	11.00	13.22	12.06	8.67	77.00
Effective Water Surface Evaporation	in	4.29	1.86	1.25	1.15	1.61	2.84	4.37	6.68	8.25	9.92	9.05	6.50	57.75
WASTEWATER GENERATION														
Facility Wastewater Influent (ADWF)	MG	1.9	1.9	1.9	1.9	1.7	1.9	1.9	1.9	1.9	1.9	1.9	1.9	22.6
I/I Contributions	MG	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0.1
TOTAL Wastewater Influent	ac-ft	5.9	5.7	5.9	5.9	5.4	5.9	5.7	5.9	5.7	5.9	5.9	5.7	69.7
WWTP CONTRIBUTIONS														
Site Run-off	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Cooling Tower Blowdown	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower Evaporation/Drift Loss	ac-ft	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.1
RECYCLED WATER DISTRIBUTION														
Dual Plumbing	ac-ft	-1.1	-1.1	-1.1	-1.1	-1.0	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-13.4
Cooling Tower	ac-ft	-0.6	-0.6	-0.6	-0.6	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-6.9
Landscape Irrigation (Casino)	ac-ft	-8.2	0.0	0.0	0.0	0.0	0.0	-8.3	-17.0	-24.3	-25.2	-23.2	-17.6	-123.8
Landscape Irrigation (TBD)	ac-ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAW WATER MAKE-UP														
Blend Raw Water[1]	ac-ft	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8	21.0	19.0	13.6	74.4
MONTHLY STORAGE BALANCE														
Beginning Storage Volume	ac-ft	0.0	0.0	4.1	8.3	12.5	16.4	20.6	16.3	3.5	0.0	0.0	0.0	
Change in Water Volume	ac-ft	0.0	4.1	4.2	4.2	3.8	4.2	-4.3	-12.8	-3.5	0.0	0.0	0.0	
Final Storage Volume	ac-ft	0.0	4.1	8.3	12.5	16.4	20.6	16.3	3.5	0.0	0.0	0.0	0.0	

Maximum Seasonal Storage (ac-ft) **20.6**
mg **6.7**

Note:
1. Blend Raw Water is the deficit in ww flow generated to meet recycled water demands, to resolve then less water would be discharged for irrigation.
2. Assumed all equipment open basin/tankage would include covers and won't contribute to ww flows, confirm as more information becomes available.
3. Cooling tower blowdown is estimated at 10% of daily water demand and is included in the facility wastewater influent projection.
4. Cooling tower evaporation loss estimated at 1.5% of monthly water demand.

Appendix C

Preliminary Grading and Stormwater Plan

PRELIMINARY GRADING AND STORMWATER PLAN
SCOTTS VALLEY CASINO AND TRIBAL COMMUNITY PROJECT

ACORN ENVIRONMENTAL

JUNE 2024

Prepared by:

Michael Mowery, P.E. (CA)

Kimley»Horn

Kimley»Horn

Table of Contents

Kimley»Horn

GRADING & DRAINAGE EXISTING CONDITIONS

The subject property is a 160-acre undeveloped property comprising of four parcels. The 160-acre property has general elevations of 800-ft in the northeast corner of the property to 130-ft at the southern end of the property. The property general grades at 13% across the property from north to south, with several mounds and hills throughout the property that divert existing runoff to earthen channels. There are two existing earthen channels that run through the property, as denoted with alluvium soil in the Geotechnical Report. These channels both run from northeast to southwest, across the midpoint of the existing property. These channels convey existing runoff from the subject property, as well as a portion of the neighboring property to the east that drains towards the subject property. The channels eventually outfall to an existing wetland on the adjacent parcels. This wetland has been mapped and is denoted in Exhibit A.

PROPOSED GRADING

Kimley-Horn has evaluated grading solutions for alternatives A, B, and C. The proposed grading aims to balance the overall earthwork onsite while matching the natural grade where possible. Grading schemes are designed such that all street flooding is prevented during a 10-year storm and all flooding from the 100-year storm can be managed before the elevation of habitable structures. All three proposed alternatives will require fill for building foundations. There are four existing landslides on the subject property. The northernmost landslide is referred to as the Hunter Hill landslide and the central landslide is referred to as the Eastern Landslide Complex. Additionally, there are two smaller unnamed landslides on the property. Proposed grading activities will avoid excavation into the landslide and setbacks or will provide mitigation measures required when excavation into the setback is required. To balance earthwork onsite, soils will be excavated from specified areas to provide fill material to the rest of the proposed project. The intent of the onsite excavation is to avoid importing or exporting offsite earthwork where possible. The proposed grading schemes of each of the alternatives are detailed below.

Alternative A – Proposed Project

The proposed finished floor elevations (FFE) of the gaming facility were determined by matching the existing grade at the north end of the building. The north end of the building is required to match the existing surface elevation to avoid excavating within the existing Eastern Landslide Complex and a 150’ landslide setback. The roadway proposed northeast of the building has been designed within the 150’ setback but remains outside the 100’ landslide setback. This roadway has been designed 5’-40’ above existing elevation to add earthwork fill within the landslide setback area. The addition of this fill is to aid in the stabilization of the landslide toe.

The proposed building entrance elevation is set at 266’ on the eastern side of the gaming facility. The FFE of the floors above and below the main entrance floor were determined based on required floor heights. The proposed gaming facility is to be built above the existing surface elevations, requiring geotechnically approved fill to be brought underneath the building. West of the proposed gaming facility is an existing 100’ PG&E powerline easement. All proposed grading activities are to be performed outside of the existing easement. The limit of grading lines shown on Exhibit B denote the edge of the proposed grading activities.

The southern road, which leads to the site egress point, slopes down at 8% to match existing elevation and reduce the need for fill material. The northern road, which leads to the tribal housing, rises at an average of 12%. This road encroaches into one of the two unnamed landslides.

The tribal housing and tribal administration building are located within a large, steep existing slope. The FFEs of the proposed housing and administration buildings are to be set at roughly the existing surface elevation or above to avoid any cut into the crest of the existing Hunter Hill landslide in the vicinity of the proposed housing. A remedial grading solution may be appropriate in this area to include the removal of landslide deposits and construction of a keyway and benched fills to provide stability for the propose housing development. See geotechnical report for additional information.

The proposed surface elevations of the gaming facility, housing and the roadways result in a total of roughly 767,000 cubic yards (CY) of required fill. To reduce importing soil to the project site, onsite soil will be excavated at locations specified by the geotechnical engineer of record, resulting in a total of roughly 632,000 cubic yards (CY) of cut material. The Excavation Area, which is included in that total cut volume, is located at the southwest of the site and can provide roughly 165,000 cubic yards (CY) of cut material. The total net earthwork volume is roughly 135,000 cubic yards (CY) of imported fill material.

The required over-excavation volume for all proposed buildings is taken into account per the Geotechnical report. The total cut volume of the site includes 3’ of cut per building footprint area. The total over-excavation volume for this Alternative is 63,000 cubic yards (CY). Additionally, the remedial grading required to remove the Hunter Hill landslide deposits and replace with building fill for the housing development has been included in the overall earthwork volumes on Exhibit B.

Alternative B – Reduced Intensity Alternative

The grading scheme for Alternative B is the same as Alternative A for a majority of the site. The only difference is the removal of the tribal housing and administration buildings at the north end of the site.

The proposed finished floor elevations (FFE) of the gaming facility were determined by matching the existing grade at the north end of the building. The north end of the building is required to match the existing surface elevation to avoid excavating within the existing landslide and a 150’ setback. The proposed building entrance elevation is set at 266’ on the eastern side of the gaming facility. The FFE of the floors above and below the main entrance floor were determined based on required floor heights. The proposed gaming facility is to be built above the existing surface elevations, requiring geotechnically approved fill to be brought underneath the building. West of the proposed gaming facility is an existing 100’ PG&E powerline easement. All proposed grading activities are to be performed outside of the existing easement. The limit of grading lines shown on Exhibit C denote the edge of the proposed grading activities. The southern road, which leads to the site egress point, slopes down at 8% to match existing elevation quickly and reduce the need for fill material.

The proposed surface elevations of the gaming facility and the roadways result in a total of roughly 510,000 cubic yards (CY) of required fill. To reduce importing soil to the project site, onsite soil will be excavated at locations specified by the geotechnical engineer of record, resulting in a total of roughly 235,000 cubic yards (CY) of cut material. The Excavation Area, which is included in that total cut volume, is located at the southwest of the site and can provide roughly 165,000 cubic yards (CY) of cut material. The total net earthwork volume is roughly 275,000 cubic yards (CY) of imported fill material.

The required over-excavation volume for all proposed buildings is taken into account per the Geotechnical report. The total cut volume of the site includes 3' of cut per building footprint. The total over-excavation volume for this Alternative is roughly 48,800 cubic yards (CY).

Alternative C – Non-Gaming Alternative

Alternative C consists of proposed commercial, housing, hotel, and administrative buildings. In general, the tribal housing is proposed on the north end of the site, the tribal admin buildings are proposed in the center of the site, and hotel and commercial buildings are proposed towards the south end of the site. The FFEs of the tribal housing were set to closely match the existing surface elevations. The foundations are proposed on and near existing 10-30% sloped hillsides. The proposed flat foundations will require the addition of retaining walls throughout the site. The northernmost housing units will require a 50' retaining wall located 15' away from adjacent houses. The easternmost housing units will require 10' and 30' retaining walls located 15' away from adjacent houses.

The proposed housing units nearest to the existing water tank are located at the highest viable elevation to reduce lateral force exerted on the development from the existing water tank and associated structures. The houses are then proposed to be tiered down the existing 30% slope, which requires the addition of 10'-30' retaining walls.

The tribal administration buildings are located at the base of the existing slopes and are proposed at elevations near the existing surface elevations. The 20' retaining wall north of the tribal administration buildings is required due to the adjacent housing units being located 20' above the administrating buildings on the existing slope.

The proposed hotel buildings are located on top of a naturally occurring slope. The FFEs of the hotel buildings are at the existing surface elevations. Fill material will be required to flatten the slope and provide compliant building pads and surface parking lots. The fill material will be composed of soils excavated onsite. The southernmost commercials buildings adjacent to the hotel parcels are located at the toe of the same slope and will also require relocation of existing onsite soils as fill material. Grading activities are to avoid the landslide areas outlined by the geotechnical engineer of record and the 100' existing PG&E powerline easement. The grading scheme outlined above is shown on Exhibit D.

The proposed buildings and roadways result in a total of roughly 317,500 cubic yards (CY) of required fill. The northern path of the proposed entry road has been designed within the 200' landslide setback. This roadway has been designed 5'-10' above existing elevation to add earthwork fill within the landslide setback area. The addition of this fill is to aid in the stabilization of the landslide toe. To reduce importing soil to the project site, onsite soil will be excavated at locations specified by the geotechnical engineer of record, resulting in a total of roughly 295,400 cubic yards (CY) of cut material. The total net earthwork volume is roughly 22,100 cubic yards (CY) of imported fill material.

The required over-excavation volume for all proposed buildings is taken into account per the Geotechnical report. The total cut volume of the site includes 3' of cut per building footprint. The total over-excavation volume for this Alternative is roughly 28,000 cubic yards (CY).

PROPOSED STORMWATER RUNOFF

Kimley-Horn has evaluated proposed stormwater runoff patterns for alternatives A, B, and C. The geotechnical engineer of record has provided Kimley Horn with an exhibit outlining the location of two naturally occurring water channels within the proposed project area. The existing water channels are referred to in this report as the northern existing channel and the southern existing channel. Both existing channels that are rerouted will outfall towards the existing wetland in their ultimate condition, which maintains existing drainage patterns.

Alternative A – Proposed Project

The existing southern channel conflicts with the proposed gaming facility development. The existing southern channel will be diverted via a swale around the north side of the gaming facility. The beginning of the diverted swale will be a concrete channel as it traverses through the eastern landslide complex. As it exits the landslide, the wash will be converted to an earthen swale to maintain natural conditions. The diverted swale will enter an existing riparian area along the western property line. The wash then re-enters the site at the southwest corner of the gaming facility and is conveyed into the existing wetland. This ultimate outfall into the wetland matches the existing flow pattern. The discharge location from the earthen swale into the wetland will dissipate towards the wetland to disperse the flow as it enters. A concrete swale is proposed along the eastern property line. This concrete swale is designed to capture offsite runoff flow from the adjacent eastern property. This offsite runoff will be conveyed via the concrete swale towards the existing wetland area. The swale will remain concrete until outside the existing landslide to the east of the wetland, after which it will be converted to an earthen swale to match natural conditions. This ultimate outfall matches existing runoff patterns. The discharge location from the swale into the wetland will dissipate towards the wetland to disperse the flow as it enters. The proposed swales are shown on Exhibit E.

The existing northern channel is not proposed to be diverted. However, there are proposed roadways that will cross the existing northern channel in several locations. Culverts are proposed underneath the roadways to convey the channel flow.

The northern channel, rerouted southern channel, and proposed concrete channel all outfall to the existing wetland area, which matches existing runoff conditions. The wetland will receive the same amount of volume as in the existing condition. However, the two points of entry to the wetland will be in new locations compared to existing conditions. The new points of entry will not affect total volume into the wetland; however, the points of entry will include earthen areas to disperse the flow prior to entering the wetland. The ultimate outfall from the wetland to the south of the property will remain unchanged.

Alternative B – Reduced Intensity Alternative

The existing southern channel conflicts with the proposed gaming facility development. The proposed diversion is the same as in Alternative A. The existing southern channel will be diverted via a swale around the north side of the gaming facility. The beginning of the diverted swale will be a concrete channel as it traverses through the eastern landslide complex. As it exits the landslide, the wash will be converted to an earthen swale to maintain natural conditions. The diverted swale will enter an existing wash along the western property line. The wash then re-enters the site at the southwest corner of the gaming facility and is conveyed into the existing wetland. This ultimate outfall into the wetland matches the existing flow pattern. The discharge location from the earthen swale into the wetland will dissipate towards the wetland to disperse the flow as it enters. A concrete swale is proposed along the eastern property line. This concrete swale is designed to capture offsite runoff flow from the adjacent eastern property. This offsite runoff will be conveyed via the concrete swale towards the existing wetland area. The swale will remain concrete until outside the existing landslide to the east of the wetland, after which it will be converted to an earthen swale to match natural conditions. This ultimate outfall matches existing runoff patterns. The discharge location from the concrete swale into the wetland will dissipate towards the wetland to disperse the flow as it enters. The proposed swales are shown on Exhibit F.

The existing northern channel does not divert water through the proposed development and is to remain unaltered.

The northern channel, rerouted southern channel, and proposed concrete channel all outfall to the existing wetland area, which matches existing runoff conditions. The wetland will receive the same amount of volume as in the existing condition. However, the two points of entry to the wetland will be in new locations compared to existing conditions. The new points of entry will not affect total volume into the wetland; however, the points of entry will include earthen areas to disperse the flow prior to entering the wetland. The ultimate outfall of the wetland to the south of the property will remain unchanged.

Alternative C – Non-Gaming Alternative

The existing southern channel conflicts with the proposed housing development. The existing southern channel will be diverted via concrete or earthen swales around the proposed buildings. The swale will begin as a concrete swale, as it traverses through the existing eastern landslide complex. As it exits the landslide, the wash will be converted to an earthen swale to maintain natural conditions. There are proposed roadways that will cross the southern channel in several locations. Culverts are proposed underneath the roadways to convey the channel flow. The diverted flow is conveyed into the existing wetland. This ultimate outfall into the wetland matches the existing flow pattern. The discharge location from the earthen swale into the wetland will dissipate towards the wetland to disperse the flow as it enters. The proposed swale is shown on Exhibit G.

The existing northern channel will be diverted an earthen swale around the proposed buildings. The channel will cross proposed roadways in several locations. Culverts are proposed underneath these roadways to convey the channel flow. The diverted swale will enter an existing wash along the western property line. The wash then re-enters the site at the western property line and is conveyed into the existing wetland. This ultimate outfall into the wetland matches the existing flow pattern. The discharge location from the earthen swale into the wetland will dissipate towards the wetland to disperse the flow as it enters.

The northern channel and southern channel will outfall to the existing wetland area, which matches existing runoff conditions. The wetland will receive the same amount of volume as in the existing condition. The point of entry into the wetland will remain as it is in the existing conditions. The point of entry will include earthen areas to disperse the flow prior to entering the wetland. The ultimate outfall of the wetland to the south of the property will remain unchanged.

PROPOSED STORMWATER TREATMENT

Kimley-Horn has evaluated proposed stormwater treatment solutions for alternatives A, B, and C. The stormwater treatment design utilizes landscaped bioretention areas to treat the impervious runoff with approved low impact development designs. The proposed project areas have been delineated into multiple drainage management Areas (DMAs). All DMAs are associated with their own bioretention treatment area. The bioretention areas are sized to be 4% of the contributing impervious surface area. The area of tributary impervious surface multiplied by the 0.04 sizing factor will equal the required surface area of the bioretention area. This sizing factor is derived from the flow-based treatment standard (runoff from 0.2 in/hr intensity rainfall) and a desired surface loading rate of 5 in/hr through the biotreatment soil mix. Bioretention areas are located at low points to capture impervious area runoff. Existing landscape areas outside of the grading limits, but within the property limits, are denoted as “self-treating areas”.

Alternative A – Proposed Project

Alternative A requires 7 unique DMAs. The location and areas of the DMAs can be found on Exhibit E.

The tribal housing and tribal administration building, along with associated roadways, are in DMA “A”. The bioretention area treating DMA “A” is south of the impervious areas. Half of the roadway south of the tribal administration building and tribal housing is treated in DMA “B”. The bioretention area for DMA “B” is located at the middle point of the road. The second half of the same road, along with a northern portion of the building roof runoff, are treated within DMA “C”. DMA “D” consists of a small portion of roadway east of the gaming facility. Due to proposed grades, the runoff from DMA “D” requires its own unique bioretention area. DMA “E” delineated runoff from the southern portion of the building and adjacent roadways. DMAs “F” and G” collect runoff from the road south of the gaming facility, as makes sense per the proposed grading.

Alternative A requires 6 separate self-treatment areas (STAs). Each STA is delineated as a unique portion of the project consisting of undisturbed pervious area. Undisturbed pervious areas do not require low impact development-based treatment, such as bioretention area. A breakdown of individual DMA areas and bioretention calculations can be found under “Stormwater Treatment Calculations” on Exhibit E.

Alternative B – Reduced Intensity Alternative

Alternative B requires 5 unique DMAs. The location and areas of the DMAs can be found on Exhibit F.

DMA “A” delineates the surface runoff area from the northern portion of the gaming facility roof as well as adjacent roadways. Due to proposed grades, the runoff from DMA “B” requires its own unique bioretention area. The second half of the same road, along with a northern portion of the building roof runoff, are treated within DMA “C”. DMAs “D” and E” collect runoff from the road south of the gaming facility.

Alternative B requires 6 separate self-treatment areas (STAs). Each STA is delineated as a unique portion of the project consisting of undisturbed pervious area. Undisturbed pervious areas do not require low impact development-based treatment, such as bioretention area. A breakdown of individual DMA areas and bioretention calculations can be found under “Stormwater Treatment Calculations” on Exhibit F.

Alternative C – Non-Gaming Alternative

Alternative C requires 12 unique DMAs. The location and areas of the DMAs can be found on Exhibit G.

The tribal housing area, along with associated roadways on the north side of the site, is split into DMAs “A”, “B”, and “C”. The runoff flows from the east to west to ultimately discharge into their own unique bioretention areas for DMAs “A”, “B”, and “C”. The tribal housing area on the western portion of the site is split into DMAs “D” and “E”. Runoff enters this area from the east and is collected into two unique bioretention areas designated for DMAs “D” and “E”, respectively.

The tribal housing area located on the east, adjacent to the water tank, is split into DMAs “F” and “G”. Runoff enters this area from the east, and ultimately discharges into two unique bioretention areas designated for DMAs “F” and “G”. The tribal admin building is located west of this tribal housing area and is considered as DMA “I”, which also has its own unique bioretention area south of the buildings.

The hotel parcels and commercial building areas make up DMA “J”, which contains a single bioretention area east of the buildings. The bioretention area captures the flow entering from the western portion of the site. DMA “L” comprises of a proposed asphalt concrete roadway. Runoff entering this DMA travels from the northwest to the southeast portion of the DMA, to ultimately discharge into the bioretention area located to the east.

Alternative C requires 4 separate self-treatment areas (STAs). Each STA is delineated as a unique portion of the project consisting of undisturbed pervious area. Undisturbed pervious

EXHIBIT A

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- EXISTING GROUND CONTOUR
- START OF STREAM
- FLOW LINE
- LANDSLIDE AREA
- WETLAND AREA

Kimley»Horn

Scotts Valley

Existing Conditions

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LIMITS OF GRADING
- PROPOSED BUILDING WALL AND OVERHANG
- 100 — EXISTING GROUND CONTOUR
- EG:(100.00) — EXISTING SPOT ELEVATION
- FG:100.00 — PROPOSED SPOT ELEVATION
- (1.0%) — EXISTING GROUND SLOPE
- 1.0% — PROPOSED GROUND SLOPE
- ASPHALT CONCRETE
- WETLAND AREA
- BIORETENTION AREA

PRELIMINARY EARTHWORK

CUT: 774,000 CY
OVER-EX: (60,000 CY)

FILL: 659,000 CY

NET: 115,000 CY (FILL)

NOTE: THE EARTHWORK QUANTITIES ABOVE ARE FOR PERMIT PURPOSES ONLY. THE CONTRACTOR IS NOT AUTHORIZED TO USE THE ESTIMATES HEREIN FOR BIDDING AND CONSTRUCTION PURPOSES WITHOUT THE EXPLICIT WRITTEN PERMISSION OF THE ENGINEER OF RECORD. NO REPRESENTATIONS OF SUCH QUANTITIES OR A BALANCED SITE CONDITION ARE MADE BY THE ENGINEER OF RECORD.

UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THE ABOVE QUANTITIES ARE APPROXIMATE, IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISHED GRADE. EXISTING GROUND IS DEFINED BY THE CONTOURS AND SPOT GRADES ON THE AVAILABLE USGS TOPOGRAPHIC INFORMATION. PROPOSED FINISHED GRADE IS DEFINED AS THE FINAL GRADE AS INDICATED ON THE GRADING PLAN(S) AS FINISHED GROUND, FINISHED SURFACE, AND FINISHED FLOOR ELEVATIONS.

UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THE ABOVE GRADING QUANTITIES HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, SUBSIDENCE, OVER-EXCAVATION AND RE-COMPACTION, AND CONSTRUCTION METHODS. NOR DO THEY ACCOUNT FOR THE THICKNESS OF PAVEMENT SECTIONS, STORMWATER QUALITY MEDIA SECTIONS, UTILITY PIPES, TRENCHING AND BEDDING MATERIALS, BUILDING OR WALL FOOTINGS, BUILDING SLAB THICKNESSES AND UNDERLYING BASE OR SAND LAYERS, REUSE OF PULVERIZED MATERIALS THAT WILL UNDERLIE NEW PAVEMENTS, ETC.

ANY OVEREXCAVATION AND RECOMPACTION DEPTHS AND VOLUMES, SHRINKAGE FACTORS, PAVEMENT SECTIONS, BUILDING PAD SECTIONS, AND BULKING FACTORS ARE BASED ON A SEPARATE GEOTECHNICAL REPORT. ANY BUILDING SLAB THICKNESSES ARE BASED ON THE SEPARATE BUILDING STRUCTURAL ENGINEERING PLANS. ANY UTILITY, STORMWATER MITIGATION, AND FOOTING SPOILS ARE BASED ON ESTIMATES PROVIDED BY THE OWNER OR CONTRACTOR.

EXHIBIT B

Kimley»Horn

Scotts Valley

Alternative A - Proposed Project - Schematic Grading

June 28, 2024

0 75 150 300 450

NORTH

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LIMITS OF GRADING
- PROPOSED BUILDING WALL AND OVERHANG
- EXISTING GROUND CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING GROUND SLOPE
- PROPOSED GROUND SLOPE
- ASPHALT CONCRETE
- WETLAND AREA
- BIORETENTION AREA

PRELIMINARY EARTHWORK

CUT: 235,000 CY
OVER-EX: (48,800 CY)

FILL: 510,000 CY

NET: 275,000 CY (FILL)

NOTE: THE EARTHWORK QUANTITIES ABOVE ARE FOR PERMIT PURPOSES ONLY. THE CONTRACTOR IS NOT AUTHORIZED TO USE THE ESTIMATES HEREIN FOR BIDDING AND CONSTRUCTION PURPOSES WITHOUT THE EXPLICIT WRITTEN PERMISSION OF THE ENGINEER OF RECORD. NO REPRESENTATIONS OF SUCH QUANTITIES OR A BALANCED SITE CONDITION ARE MADE BY THE ENGINEER OF RECORD.

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UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THE ABOVE GRADING QUANTITIES HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, SUBSIDENCE, OVER-EXCAVATION AND RE-COMPACTION, AND CONSTRUCTION METHODS. NOR DO THEY ACCOUNT FOR THE THICKNESS OF PAVEMENT SECTIONS, STORMWATER QUALITY MEDIA SECTIONS, UTILITY PIPES, TRENCHING AND BEDDING MATERIALS, BUILDING OR WALL FOOTINGS, BUILDING SLAB THICKNESSES AND UNDERLYING BASE OR SAND LAYERS, REUSE OF PULVERIZED MATERIALS THAT WILL UNDERLIE NEW PAVEMENTS, ETC.

ANY OVEREXCAVATION AND RECOMPACTION DEPTHS AND VOLUMES, SHRINKAGE FACTORS, PAVEMENT SECTIONS, BUILDING PAD SECTIONS, AND BULKING FACTORS ARE BASED ON A SEPARATE GEOTECHNICAL REPORT. ANY BUILDING SLAB THICKNESSES ARE BASED ON THE SEPARATE BUILDING STRUCTURAL ENGINEERING PLANS. ANY UTILITY, STORMWATER MITIGATION, AND FOOTING SPOILS ARE BASED ON ESTIMATES PROVIDED BY THE OWNER OR CONTRACTOR.

EXHIBIT C

Kimley»Horn

Scotts Valley

Alternative B - Reduced Intensity Alternative - Schematic Grading

June 26, 2024

0 75 150 300 450

NORTH

EXHIBIT D

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- RETAINING WALL
- GRADING LIMITS
- 100 EXISTING GROUND CONTOUR
- FS:(100.00) EXISTING SPOT ELEVATION
- FS:100.00 PROPOSED SPOT ELEVATION
- (1.0%) EXISTING GROUND SLOPE
- 1.0% PROPOSED GROUND SLOPE
- ASPHALT CONCRETE
- WETLAND AREA
- BIORETENTION AREA

PRELIMINARY EARTHWORK

CUT: 295,400 CY
OVER-EX (28,000 CY)

FILL: 317,500 CY

NET: 22,100 CY (FILL)

NOTE: THE EARTHWORK QUANTITIES ABOVE ARE FOR PERMIT PURPOSES ONLY. THE CONTRACTOR IS NOT AUTHORIZED TO USE THE ESTIMATES HEREIN FOR BIDDING AND CONSTRUCTION PURPOSES WITHOUT THE EXPLICIT WRITTEN PERMISSION OF THE ENGINEER OF RECORD. NO REPRESENTATIONS OF SUCH QUANTITIES OR A BALANCED SITE CONDITION ARE MADE BY THE ENGINEER OF RECORD.

UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THE ABOVE QUANTITIES ARE APPROXIMATE, IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISHED GRADE. EXISTING GROUND IS DEFINED BY THE CONTOURS AND SPOT GRADES ON THE BASE SURVEY. PROPOSED FINISHED GRADE IS DEFINED AS THE FINAL GRADE AS INDICATED ON THE GRADING PLAN(S) AS FINISHED GROUND, FINISHED SURFACE, AND FINISHED FLOOR ELEVATIONS.

UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THE ABOVE GRADING QUANTITIES HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, SUBSIDENCE, OVER-EXCAVATION AND RE-COMPACTION, AND CONSTRUCTION METHODS. NOR DO THEY ACCOUNT FOR THE THICKNESS OF PAVEMENT SECTIONS, STORMWATER QUALITY MEDIA SECTIONS, UTILITY PIPES, TRENCHING AND BEDDING MATERIALS, BUILDING OR WALL FOOTINGS, BUILDING SLAB THICKNESSES AND UNDERLYING BASE OR SAND LAYERS, REUSE OF PULVERIZED MATERIALS THAT WILL UNDERLIE NEW PAVEMENTS, ETC.

ANY OVEREXCAVATION AND RECOMPACTION DEPTHS AND VOLUMES, SHRINKAGE FACTORS, PAVEMENT SECTIONS, BUILDING PAD SECTIONS, AND BULKING FACTORS ARE BASED ON A SEPARATE GEOTECHNICAL REPORT. ANY BUILDING SLAB THICKNESSES ARE BASED ON THE SEPARATE BUILDING STRUCTURAL ENGINEERING PLANS. ANY UTILITY, STORMWATER MITIGATION, AND FOOTING SPOILS ARE BASED ON ESTIMATES PROVIDED BY THE OWNER OR CONTRACTOR.

Kimley»Horn

Scotts Valley

Alternative C - Non-Gaming Alternative - Schematic Grading

June 27, 2024

0 50 100 200 300

NORTH

EXHIBIT E

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- RETAINING WALL
- PROPOSED BUILDING WALL AND OVERHANG
- DRAINAGE MANAGEMENT AREA BOUNDARY
- SURFACE FLOW DIRECTION
- ASPHALT CONCRETE
- WETLAND AREA
- BIORETENTION AREA
- A — DMA NUMBER
- ##,### — DMA AREA (SF)

STORMWATER TREATMENT CALCULATIONS

Drainage Management Area	Total Area (SF)	Impervious Area (SF)	Pervious Area (SF)	Effective Impervious Area (SF)	Bioretention Area Required (SF)	Bioretention Area Provided (SF)
A	458000	186000	272000	213200	8528	11800
B	193700	40000	153700	55370	2215	6100
C	452800	180000	272800	207280	8291	10500
D	104000	28000	76000	35600	1424	2400
E	581500	396000	185500	414550	16582	21500
F	413000	63000	350000	98000	3920	7250
G	130000	40000	70000	47000	1880	3800

Self Treating Area	Total Area (SF)
ST-1	2510000
ST-2	370000
ST-3	100000
ST-4	537000
ST-5	350000
ST-6	40000

Total Project Area	
148.74	Acres
6228000	SF

Kimley»Horn

Scotts Valley

Alternative A - Proposed Project - Stormwater Management

June 28, 2024

0 75 150 300 450

NORTH

EXHIBIT F

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- RETAINING WALL
- PROPOSED BUILDING WALL AND OVERHANG
- DRAINAGE MANAGEMENT AREA BOUNDARY
- SURFACE FLOW DIRECTION
- ASPHALT CONCRETE
- WETLAND AREA
- BIORETENTION AREA
- A — DMA NUMBER
- ##,### — DMA AREA (SF)

STORMWATER TREATMENT CALCULATIONS

Drainage Management Area	Total Area (SF)	Impervious Area (SF)	Pervious Area (SF)	Effective Impervious Area (SF)	Bioretention Area Required (SF)	Bioretention Area Provided (SF)
A	452800	180000	272800	207280	8291	10500
B	104000	28000	76000	35600	1424	2400
C	581500	396000	185500	414550	16582	21500
D	413000	63000	350000	98000	3920	7250
E	110000	40000	70000	47000	1880	3800

Self Treating Area	Total Area (SF)
ST-1	3531700
ST-2	100000
ST-3	537000
ST-4	350000
ST-5	40000

Total Project Area	
148.74	Acres
6228000	SF

Kimley»Horn

Scotts Valley

Alternative B - Reduced Intensity Alternative - Stormwater Management

June 26, 2024

0 75 150 300 450

NORTH

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- RETAINING WALL
- DRAINAGE MANAGEMENT AREA BOUNDARY
- PROPOSED SURFACE FLOW DIRECTION
- ASPHALT CONCRETE
- WETLAND AREA
- BIORETENTION AREA
- A — DMA NUMBER
- ##,### — DMA AREA (SF)

STORMWATER TREATMENT CALCULATIONS

Drainage Management Area	Total Area (SF)	Impervious Area (SF)	Pervious Area (SF)	Effective Impervious Area (SF)	Bioretention Area Required (SF)	Bioretention Area Provided (SF)
A	96000	25000	71000	32100	1284	2800
B	79000	40000	39000	43900	1756	2800
C	91000	45000	46000	49600	1984	2800
D	90000	36000	54000	41400	1656	3500
E	179000	139000	40000	143000	5720	6400
F	92000	44000	48000	48800	1952	4800
G	163000	90000	73000	97300	3892	10800
H	68000	30000	38000	33800	1352	1600
I	160000	108000	52000	113200	4528	6200
J	400000	219000	181000	237100	9484	13500
K	146000	75000	71000	82100	3284	6800
L	125000	58000	67000	64700	2588	5800

Self Treating Area	Total Area (SF)
ST-1	4027000
ST-2	177000
ST-3	262000
ST-4	65000

Total Project Area	
148.74	Acres
6220000	SF

EXHIBIT G

Kimley»Horn

Scotts Valley

Alternative C - Non-Gaming Alternative - Stormwater Management

June 27, 2024

0 50 100 200 300

NORTH

Appendix D

Preliminary Geotechnical Exploration

SCOTTS VALLEY DEVELOPMENT
VALLEJO, CALIFORNIA

PRELIMINARY GEOTECHNICAL EXPLORATION

SUBMITTED TO
Ms. Bibiana Sparks
Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762

PREPARED BY
ENGEO Incorporated

June 19, 2024
Latest Revision June 27, 2024

PROJECT NO.
16484.000.001

ENGEO
Expect Excellence

GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES
CONSTRUCTION SERVICES
COASTAL/MARINE GEOTECHNICS

Project No.
16484.000.001

June 19, 2024
Latest Revision June 27, 2024

Ms. Bibiana Sparks
Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762

Subject: Scotts Valley Development
Admiral Callaghan Lane and Columbus Parkway
Vallejo, California

PRELIMINARY GEOTECHNICAL EXPLORATION

Dear Ms. Sparks:

At your request, we have prepared this preliminary geotechnical report for the Scotts Valley Development in Vallejo, California. Our services were performed as outlined in our agreement dated March 7, 2024. We understand that the site is planned for mixed use development; current conceptual plans include a combination of residential lots, administrative buildings, and commercial buildings, along with associated site improvements. At this time, the details have not been finalized.

Based on our preliminary findings, it is our opinion from a geotechnical viewpoint that the site is suitable for the proposed development, provided that the recommendations contained in this report are incorporated into planning, and that a design-level, site-specific geotechnical exploration is performed to develop design recommendations.

The main geotechnical and geologic considerations at the site include landslides and the stability of natural slopes; expansive soil; excavation and rippability of strong in-place bedrock units where grading and development areas are planned; potentially compressible alluvium and colluvium; undocumented fill; the presence of natural springs and drainages; and other hydrogeologic conditions at the site. This report discusses our conclusions and preliminary findings regarding these considerations.

We trust that this document provides geotechnical guidance appropriate for the current planning process. If you have any questions or comments regarding this report, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

REGISTERED PROFESSIONAL ENGINEER
ANNAMARIE R. USHER
No. 83459
CIVIL
STATE OF CALIFORNIA

Anne Robertson, PE

Theodore P. Bayham, GE, CEG

REGISTERED PROFESSIONAL ENGINEER
THEODORE P. BAYHAM
No. 2480
GEOTECHNICAL
STATE OF CALIFORNIA

J. Brooks Ramsdell, CEG

awr/jbr/tbp/ar

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

We prepared this preliminary geotechnical report to identify potential geologic hazards and provide preliminary geotechnical, geologic, and hydrogeologic characterization of the Scotts Valley Development in Vallejo, California.

As outlined in our agreement dated March 7, 2024, you authorized us to conduct the following scope of services.

- Review available geologic and hydrogeologic literature for the site and the provided site plans
- Review the previous geotechnical report prepared by KC Engineering for the neighboring parcel (Lee Property) located east of the site, north of Columbus Parkway (2021)
- Perform a subsurface field exploration consisting of infiltration testing, borings, and test pits
- Conduct laboratory testing of representative soil samples
- Assess hydrogeologic conditions at the site
- Develop preliminary recommendations and conclusions
- Prepare this preliminary geotechnical report

For our use, we received a conceptual site plan prepared by Steelman Partners, dated May 24, 2024, and schematic grading plans for Alternatives A, B, and C prepared by Kimley Horn, dated June 27, 2024 (see Section 1.3).

This report was prepared for the exclusive use of our client and their consultants for the design of this project. If any changes are made in the character, design, or layout of the development, we must be contacted to review the conclusions and recommendations contained in this report to evaluate whether modifications are recommended. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without our express written consent.

1.2 PROJECT LOCATION

The project site is approximately 160 acres in size, and it is located at the northeastern corner of Interstate 80 (I-80) interchange with Columbus Parkway in Vallejo, California. The Assessor's Parcel Numbers (APNs) for the site include APNs 0812-010-010 and 0812-020-020, 0812-020-080, and 0812-020-010. The property is bordered to the south and west by the Solano Bike Pathway and I-80, to the north by the western ridge of Sulphur Springs Mountain, to the east by privately owned open space including a water tower, and to the south by Columbus Parkway. Access to the site is provided through a bicycle path located at the southwestern corner of the site and through a locked gate.

Figure 1 displays a site Vicinity Map. Figures 2A and 2C show site boundaries, proposed grading limits, exploratory locations, surface geology, and spring locations based on our geotechnical and geologic explorations. Figures 2B and 2D show proposed development locations and surface geology.

1.3 PROJECT DESCRIPTION

The conceptual site plans for the project depict three potential layout alternatives, as described below. Site improvements are also planned for each of the alternatives, including paved streets and parking areas, pedestrian pathways and sidewalks, landscaping, bioretention areas, and below-grade utilities. Planned developments at the site are primarily located on APN 0812-010-010, which in this report is referred to as “development area.” This area is shown in black in Figures 2A through 2D.

<u>Alternative A – Proposed Project</u>

- Tribal housing and administrative buildings in the northern portion of the development area
- Eight-story casino structure with parking levels, restaurants, bars, and a ballroom/event space in the central portion of the development area
- A planned borrow area to accommodate approximately 165,000+/- cubic yards (cyds) of cut

<u>Alternative B – Reduced Intensity Alternative</u>

- Eight-story casino structure with parking levels, restaurants, bars, and a ballroom/event space in the central portion of the development area
- A planned borrow area to accommodate approximately 165,000+/- cyds of cut

<u>Alternative C – Non-Gaming Alternative</u>

- Tribal housing and administrative buildings in the central portion of the development area
- Hotel parcels and commercial buildings in the southern portion of the development area
- At-grade parking areas
- Planned borrow areas to accommodate approximately 295,400+/- cyds of cut

The proposed development areas for the gaming and non-gaming alternatives are shown in Figures 2B and 2D, and in Exhibits 1.3-1 through 1.3-3.

EXHIBIT 1.3-1: Alternative A – Proposed Project

EXHIBIT 1.3-2: Alternative B – Reduced Intensity Alternative

EXHIBIT 1.3-3: Alternative C – Non-Gaming Alternative

We understand that the proposed development alternatives may be subject to change during the project planning process. A structural plan was not provided to us for our review prior to preparation of this report. This report addresses the primary geologic and geotechnical concerns for the project as they relate to the referenced project planning documents.

2.0 FINDINGS

2.1 SITE BACKGROUND

The project site is located within a historical quarry and mining area. One prominent mercury mining site, St. John's Mine, is located approximately 1 mile northeast of the site, on the northern ridge of Sulphur Springs Mountain. We understand that St. John's Mine is no longer active. The project site itself has historically been used as a quarry, and existing tailings piles from quarry activities have been identified near the center of the site.

2.2 REGIONAL GEOLOGY

The project site lies on the eastern edge of the Coast Range Geomorphic Province. The region is characterized by numerous northwest-trending thrust faults, including the Lake Herman, Sky Valley, and Green Valley Faults (Graymer et al., 1999). The project site is primarily underlain by Cretaceous and Jurassic age Great Valley sedimentary rocks. Along the ridge to the northeast and along the eastern edge of the site, Great Valley rocks are overridden by a thrust-block of Jurassic Coast Range Ophiolite sequence silica-carbonate rock (Bezore et al., 1998, Graymer et al., 1999). The contact between the silica-carbonate rock and underlying Great Valley Rocks is mapped by Graymer et al. as a partially concealed thrust fault trace of the Lake Herman Fault, which transects the northeastern portion of the site (1999). It is not known to be active.

Published maps of the site by USGS and CGS also note that the area is characterized by expansive landslides through both silica-carbonate rock and Great Valley Sequence rock on the southern slope of Sulphur Springs Mountain (Bezore et al, 1998, Graymer et al., 1999).

We present a regional geologic map of the site in Figure 3.

2.3 REGIONAL SEISMICITY

The site is in a seismically active area that contains numerous faults. Small earthquakes occur every year in the Bay Area region and larger earthquakes have been recorded and can be expected to occur in the future. Faults have been cataloged and mapped by the United States Geological Survey (USGS) in the Quaternary Fault and Fold Database of the United States. An active fault is defined by the California Geologic Survey as one that experienced surface displacement within Holocene time (about the last 11,700 years) (CGS, 2018). Figure 4 shows the approximate locations of known active faults, along with other Quaternary faults, based on the USGS Quaternary Fault and Fold Database, as well as significant historical earthquakes recorded within the Bay Area region. We note that the Lake Herman Fault, which transects the site, is not characterized as an active fault.

To identify nearby faults that may generate strong seismic ground shaking at the site, we used the USGS Earthquake Hazard Toolbox and the 2018 National Seismic Hazard Model (NSHM) to perform a disaggregation of the seismic hazard at the peak ground acceleration (PGA) and at spectral periods up to 3 seconds for a return period of 2,475 years. The resulting faults are listed in Table 2.3-1.

TABLE 2.3-1: Faults Considered Capable of Producing Strong Ground Shaking at the Site*
Latitude: 38.144326 Longitude: -122.215092

SOURCE NAME	RUPTURE DISTANCE, R_{RUP} (km)	RUPTURE DISTANCE, R_{RUP} (mi)	MOMENT MAGNITUDE, M_W
Green Valley (3)	13.6	8.4	7.08
Contra Costa (Lake Chabot) [2] (1)	1.6	1.0	6.94
West Napa (6)	3.4	2.1	6.94
Contra Costa (Connected) [1] (0)	2.1	1.3	7.11
Contra Costa (Vallejo) [2] (1)	3.7	2.3	6.95
Franklin (5)	6.4	4.0	7.07
Hayward (North) (6)	19.5	12.1	8.05
Great Valley 4b (Gordon Valley)	20.9	13.0	7.20
Green Valley (6)	13.7	8.5	7.00
San Andreas (Peninsula) (15)	48.1	29.9	8.05

*Based on USGS Earthquake Hazard Toolbox: NSHM Conterminous U.S. 2018

These results represent known fault sources contributing at least 1 percent to the seismic hazard at the site considering spectral periods ranging from the PGA to 1 second for the given return period. The rupture distances (R_{RUP}) and mean moment magnitudes (M_W) listed are based on values assigned according to the 2018 NSHM, and the numbers in parentheses after the fault names correspond to fault subsections assigned by the NSHM. Note that the above fault table is not an exhaustive list and other faults in the region may generate seismic shaking at the project site.

In 2014, the Working Group on California Earthquake Probabilities estimated the 30-year likelihood of one or more M_W 6.7 or greater earthquake events in the San Francisco Bay Area region at approximately 72 percent, considering the known seismic sources in the region.

2.4 REVIEW OF HISTORICAL AERIAL PHOTOGRAPHS

We reviewed available historical stereographic aerial photographs covering the site from years between 1937 to 1987. We also reviewed available Google Earth imagery covering the site between the years of 1993 to 2024.

Based on our review, the site has remained relatively undeveloped since the earliest photographs covering the site. The existing springs and one of the existing transmission lines present at the site are visible in the 1937 photographs. A fill slope was constructed along a portion of the western boundary of the site associated with I-80 in the 1950's. This fill was later expanded towards the east with the widening of I-80 in the 1960's. The I-80 and Highway 37 interchange was upgraded sometime in the 1970's, and during this grading the knoll located at the southwest corner of the site was cut down to it current elevation by removing over 60 feet of material. Based on our review of the aerial photos, it appears the water tank located just east of the site was constructed sometime between 1987 and 1993.

Several of the large bedrock landslides mapped and discussed in more detail later in this report are visible in the stereographic aerial photographs covering the site.

2.5 2021 GEOTECHNICAL REPORT FOR NEIGHBORING PROPERTY

We reviewed an available geotechnical report prepared by KC Engineering (2021) for the neighboring Lee Property, located east of the project development area and immediately north of Columbus Parkway. The KC Engineering report included their findings, conclusions, slope stability analysis, and recommendations, which are summarized as follows.

- Clayey colluvium and alluvium deposits up to 24 feet thick were encountered in the central and southern portions of the site. These were found to be highly expansive and to have R-values of 5 or less.
- Groundwater was encountered at two exploration locations at depths of 20 feet and 8½ feet.
- The northern and eastern portions of the site are underlain by landslide deposits.
- KC Engineering performed slope stability analyses of the landslide to the north of the site. Their analysis concluded that the landslide area could potentially be stabilized by construction of an earthwork buttress at the toe. The buttress considered in the analysis was approximately 250 feet wide and 90 feet tall and included removal of some of the landslide deposits.

ENGEO scope for this report does not include a geotechnical review of the work performed by KC Engineering for the adjacent property. Thus, we cannot render our opinion on their analysis and design recommendations in this report. The KC Engineering study is not intended to be used for the Scott Valley development project.

2.6 FIELD EXPLORATION

We conducted a surface and subsurface exploration of the development area between April 9 and April 24, 2024, which included drilling 3 borings, excavating 24 test pits, and conducting 6 infiltration tests at various locations shown in the Site Plan, Figures 2A and 2C. We also performed geologic field mapping concurrently.

The locations of our explorations are approximate and were estimated using coordinates taken on site using Google Earth; they should be considered accurate only to the degree implied by the method used. The exploration elevations were estimated from the project LiDAR data and should be considered accurate only to the degree implied by the method used. All elevations in this report refer to the North American Vertical Datum of 1988 (NAVD 88) unless otherwise specified.

2.6.1 Borings

We observed drilling of three borings at the locations shown in the Site Plan, Figures 2A and 2C. An ENGEO representative observed the drilling and logged the subsurface conditions at each location. We retained a track-mounted CME-55 drill rig and crew to advance the borings. Boring 1-B1 was advanced using 5-inch mud-rotary drilling and HQ wireline coring methods. Boring 1-B2 was advanced using 8-inch hollow-stem auger drilling methods. Boring 1-B3 was advanced using solid-flight auger and dry-coring methods. The borings were advanced to depths ranging from 43 to 75½ feet below existing grade. Boring 1-B3 was terminated at a depth of 60 feet, the maximum depth of the drillers' equipment. We permitted and backfilled the borings in accordance with the requirements of Solano County Environmental Health Division.

We obtained bulk soil samples from drill cuttings and retrieved disturbed samples at various intervals in the borings using standard penetration tests and Modified California samplers.

The standard penetration resistance test (SPT) blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The 2-inch outside diameter (O.D.) split-spoon sampler was driven 18 inches and the number of blows was recorded for each 6 inches of penetration. In addition, 2½-inch inside diameter (I.D.) samples were obtained using a Modified California sampler driven into the soil with the 140-pound hammer previously described. Unless otherwise indicated, the blows per foot recorded on the boring log represent the accumulated number of blows to drive the last foot of penetration; the blow counts have not been converted using any correction factors. When sampler driving was difficult, penetration was recorded only as inches penetrated for 50 hammer blows.

The boring and core logs depict subsurface conditions at the boring locations during the exploration; however, subsurface conditions may vary with time. The boring logs are included in Appendix A.

2.6.2 Test Pits

We observed excavation of 24 test pits at the locations shown in the Site Plan, Figures 2A and 2C. An ENGEO representative observed the test pit excavation and logged the subsurface conditions at each location. We retained a subcontractor using a track mounted Bobcat 325 excavator to dig the test pits using an 18-inch-wide bucket and logged the type, location, and uniformity of the underlying soil and rock. The maximum depth penetrated by the test pits was 8 feet.

We obtained bulk soil samples from test pits using hand-sampling techniques. The test pit logs present descriptions and photos of the subsurface conditions encountered.

The logs depict subsurface conditions at the test pit locations during the exploration; however, subsurface conditions may vary with time. The test pit logs are included in Appendix A.

2.6.3 Infiltration Tests

Photo 2.6.3-1: Infiltration Field Set-Up

We performed six field infiltration tests within the development area on April 9, 2024, using a Modified Philip Dunne (MPD) Infiltrometer. The MPD tests were performed in general conformance with ASTM D8152-18. Test methods included scarifying the ground surface soil, removing vegetation, and embedding a graduated cylinder to a depth of 2 inches. We covered the test apparatus with an umbrella to prevent it from overheating. The cylinder was filled with approximately 1 gallon of water, and a head drop (fall in the water level in centimeters) was recorded over time.

The raw infiltration data is included in Appendix B. Note that some of the tests show a NULL output due to insufficient elevation head loss over the duration of the test (head loss must be greater than 10 cm over the duration of the test to show a result). At these locations, we analyzed output results provided and assessed the soil type at each location to develop the range of preliminary design infiltration rate values provided below. The field-measured infiltration rates and preliminary recommended range of design infiltration rates are summarized in the table below. No factors of safety or correction factors have been applied.

TABLE 2.6.3-1: Preliminary Design Infiltration Rates

TEST LOCATION	TEST METHOD	USCS SOIL TYPE	FIELD MEASURED INFILTRATION RATE (inch/hour)	PRELIMINARY DESIGN INFILTRATION RATES (inch/hour)
1-MPD1	MPD	CL	0.0*	0.0*
1-MPD2	MPD	SC	1.05	0.8 - 1.0
1-MPD3	MPD	CL	0.0*	0.0*
1-MPD4	MPD	SC	3.10	2.5 - 3.0
1-MPD5	MPD	SC	0.54*	0.4 - 0.5*
1-MPD6	MPD	CL	0.03*	0.00 - 0.03*

** indicates NULL output in Upstream Technologies Infiltration Report*
CL – Lean Clay
SC – Clayey Sand

2.6.4 Geologic Field Mapping

During our field explorations, an ENGEO geologist observed and mapped the surface conditions and visible geologic features in the development area. We include our preliminary map of surface geology in the Site Plan, Figures 2A and 2C.

2.7 LABORATORY TESTING

We performed laboratory tests on selected soil samples to evaluate some of their engineering properties. For this project, we performed moisture content, dry density, grain size analysis, plasticity index, hydrometer testing, and limited strength testing. Moisture contents, dry densities, and unconfined compressive strengths are recorded on the boring logs in Appendix A; other laboratory data is included in Appendix C.

2.8 SURFACE CONDITIONS

The topography of the development area is generally hilly and hummocky. The northeastern portion is characterized by a relatively steep hillside at the base of Sulpher Springs Mountain, which slopes towards the southwest. The remainder of the development area consists of gentle hills and hummocks formed from eroded and/or cut bedrock ridges. Development area elevations range from approximately Elevation 800 feet (NAVD 88) in the northeastern corner near Sulpher Springs Mountain to Elevation 130 feet in the southeastern corner. We observed the following site features during our reconnaissance.

- Cattle are present in the development area and the property is currently used for grazing.
- Two spring-fed stream channels traverse the development area, flowing in parallel towards the southwest. Both channels culminate in the lowlands near the southeastern corner of the site in a wetland. Water was flowing through both channels at the time of our reconnaissance.
- Two Pacific Gas & Electric (PG&E) transmission lines and associated easements traverse the site north to south; one along the western boundary, and the other cutting through the northeastern corner of the site.

- The site is generally covered with seasonal grasses and low shrubs. More dense and green vegetation is located along the spring fed stream beds.
- An existing water tank borders the eastern boundary of the development area. The surrounding concrete basin and metal fence encroach on the project development area by approximately 50 feet.
- Several existing dirt roads and tire tracks are present traversing the site. These cross the existing stream beds and wetlands. Access from the entrance at the southern end of the site requires crossing at least one of the streams.
- The stream to the north has been channelized into a corrugated metal pipe culvert beneath one of the dirt access roads.

Please refer to the Site Plan, Figures 2A and 2C, for more information on site features.

2.9 SUBSURFACE CONDITIONS

Preliminary geologic mapping is included in Figures 2A and 2C, based on findings from our exploration, geologic reconnaissance, and examination of aerial photography. We also present two preliminary geologic cross-sections which extend below the proposed development areas in Figure 5. Our interpretation of the main geologic units identified within the development area is summarized below.

2.9.1 Artificial Fill (af)

Relatively thin artificial fill deposits, possibly associated with previous mining activities, was encountered in Test Pits 1-TP12 and 1-TP14 near the center of the development area, below the historical quarry area. The fill ranged from 1 to 4 feet deep in Test Pits 1-TP12 and 1-TP14, respectively. This fill consisted of silty gravel and very soft to medium stiff gravelly fat clay.

Thicker artificial fill is present to the west of the project site, along the I-80 corridor.

2.9.2 Colluvium - Qc (Holocene)

In our explorations, we identified colluvial deposits within swales on the lower flanks of hill slopes, and in topographic low-lying areas. Colluvium is generally considered of medium stiff to very stiff clay with variable amounts of gravel and sand. Some deposits were soft in the upper 3 feet. The thickness of colluvium encountered during our exploration ranged from 2½ to greater than 8 feet in our test pits, and up to 13 feet in our borings.

2.9.3 Alluvium – Qal (Holocene)

In our explorations, we identified alluvial deposits in the areas along and surrounding the drainages in the development area. Alluvium in the development area varies from sandy lean clay to fat clay with gravel. The alluvial deposits are typically moist and range from very soft to very stiff. We found colluvium and alluvium interlayered in the low-lying areas of the development area. We anticipate that depths of interlayered deposits of colluvium and alluvium may exceed 20 feet in the west-central portion of the development area. Saturated clay soil may be potentially compressible and may exhibit high settlements when subjected to building loads.

2.9.4 Landslides (Qls)

We reviewed historical stereoscopic aerial photographs from various years, published geologic maps by Bezore et al. (1998) and Graymer et al. (1999), landslide hazard maps by Manson (1988), documentation by Caltrans, site topographic maps, and our field exploration data to estimate the extents of existing landslides at the site.

We identified four landslides, which are numbered for discussion on the Site Plan, Figures 2A and 2C. Two of these, Hunter Hill Landslide and the Eastern Landslide Complex, are critical to project planning and development due to their location relative to the proposed structures and site improvements. These landslides are identified as Landslide 1 and Landslide 3, respectively. Landslide 2 (mapped as possible landslide feature) should be considered in project planning because of its relationship to proposed access roads. These three landslides are discussed in detail in the following sections.

2.9.4.1 Hunter Hill Landslide

Hunter Hill Landslide (Landslide 1) is a deep-seated landslide through Great Valley Sequence bedrock located on the northwestern portion of the development area. It crosses I-80, and is estimated to be approximately 1,300 feet long, 600 feet wide, and approximately 60 feet deep on average (Caltrans, 2005). Ongoing roadway distress and cracking in the Solano Bike Pathway indicate continued creeping movement of the landslide, with rates increasing during wet years. Inclinometers installed by Caltrans near the landslide showed movement below I-80, approximately 30 feet below the roadway surface between 2003 and 2005 (Caltrans, 2005). At Boring 1-B3, we encountered landslide deposits through the full depth of our exploration; we therefore interpret the landslide plane depth at this location to be greater than 60 feet.

According to documentation by Caltrans, a vertical drainage gallery was partially constructed in 1990 through the existing landslide near the bike path to reduce water pressures in the landslide, at the approximate location shown in Figures 2A and 2C. The drainage gallery was planned to consist of vertical sand drains 3 feet in diameter, approximately 53 feet deep, and spaced at 6 feet on-center, interconnected at the bottom by overlapping bells. It was intended to be drained to the southwest under I-80 by a horizontal perforated pipe (Caltrans, 1988). The bottom drain from the drainage gallery was never completed due to the presence of hard rock and difficult drilling conditions. The as-built depth and lateral extent of the gallery are not known, but these are expected to be less than the planned dimensions due to early termination of the project (Caltrans 1990a, 1990b). Therefore, an elevated water table may still be present in this area of the landslide. Groundwater depth fluctuates between approximately 10 and 14 feet below ground surface near the gallery (Caltrans, 2005). We did not observe the drainage gallery during our site reconnaissance.

2.9.4.2 Landslide 2 (mapped as possible landslide feature)

The area labeled as Landslide 2 (mapped as possible landslide feature) is along a ridgeline of outcropping silica-carbonate rock. The ridge is situated in the northeastern portion of the site, immediately to the east of the Lake Herman thrust fault. We consider this geomorphic feature a possible slide, which may have detached from upslope silica-carbonate bedrock, and moved towards the south-southwest; however whether this is an actual landslide hazard or not is unknown. Furthermore, based on our preliminary assessment of this feature and the proposed access roads, we believe there is a low risk of reducing stability in these areas, provided that minimal cuts and fills (less than 5 feet deep) are associated with access road grading. If necessary, further evaluation of this possible landslide could be conducted as part of design-level geotechnical study.

2.9.4.3 Eastern Landslide Complex

Published geologic maps indicate a large landslide partially underlying the eastern portion of the project development area, which we refer to in this report as the Eastern Landslide Complex (Landslide 3). The Eastern Landslide Complex is more than 350 acres in area and contains numerous nested landslide planes and source areas. Published geologic maps disagree on the exact extents of this landslide complex. The western boundary of the Eastern Landslide Complex shown in Figures 2A and 2C is based on our site-specific field investigation and may be used for project planning purposes. The southern boundary of the Eastern Landslide Complex is mapped as extending into the neighboring Lee Property (KC Engineering, 2021).

At its western boundary, the Eastern Landslide Complex abuts two ridges comprised of silica-carbonate rock. Based on the results of our preliminary field mapping, we consider these ridges to be in place. The depth and full extent of the landslide deposits between the ridges is not fully constrained. We encountered landslide deposits consisting of highly sheared and altered shale at Boring 1-B1 to the full exploration depth of 75½ feet.

2.9.5 Bedrock

Much of the project development area is underlain by relatively shallow bedrock with a thin (approximately 1 to 3 feet thick) residual soil cap over bedrock. The bedrock units encountered during our exploration are consistent with those mapped by Bezore et al. (1998) and Graymer et al. (1999) and include Early to Late Cretaceous Great Vally Sequence (Kgv), and Jurassic Coast Range Ophiolite Sequence silica-carbonate rock (sc).

Great Valley Sequence rock underlies the western portion of the development area, and consists of Cretaceous age sandstone, siltstone, shale, and minor conglomerates. Great Valley Sequence rocks encountered in our explorations included moderately to slightly weathered, moderately strong to strong siltstone, shale, and sandstone. Shale and siltstone bedding was generally very thin to thin. Local areas of weak to very weak rock, with localized areas of intense shearing and fractures and increased weathering, were observed within landslide areas and near the Lake Herman thrust fault.

Silica-carbonate (sc) rock makes up the hanging wall of the Lake Herman thrust fault on the eastern portion of the development area. Silica-carbonate rock is formed from altered ultramafic rock of the Jurassic-age Coast Range Ophiolite Sequence. Coast Range Ophiolite rocks also locally contain basalt, gabbro, serpentinite, and pyroxenite.

2.10 GROUNDWATER

During our field exploration, we encountered groundwater in Boring 1-B2 at a depth of 14 feet below the existing ground surface within Great Valley Sequence rock. Water was not encountered in Boring 1-B3 to final depth of the boring (60 feet). The depth to groundwater in Boring 1-B1 was obscured due to the drilling method used; however, the partially stabilized groundwater table was recorded at 11 feet below the ground surface at the beginning of the second day of drilling. Reports from Caltrans indicate that groundwater depths near the drainage gallery (shown in Figures 2A and 2C) fluctuate seasonally between depths of approximately 10 to 14 feet (Caltrans, 2005).

We also observed surface water flowing from springs and then down the existing drainages across the development area.

Fluctuations in the level of groundwater may occur due to variations in rainfall, irrigation practice, and other factors not evident at the time measurements were made. We include a draft assessment of the hydrogeologic conditions at the development area, which we published on May 2, 2024, in Appendix D.

3.0 PRELIMINARY GEOTECHNICAL CONCLUSIONS

From a geotechnical engineering viewpoint, in our opinion, the development area is conditionally feasible for the proposed development, provided the geotechnical recommendations in this report are properly incorporated into project planning and that a design-level, site-specific geotechnical exploration is performed to develop design recommendations.

The main geotechnical and geologic considerations at the development area include landslides and the stability of natural slopes, expansive soil, excavation and rippability of strong in-place bedrock units where grading and development areas are planned, potentially compressible alluvium and colluvium, undocumented fill, the presence of natural springs and drainages, and other hydrogeologic conditions at the site. The following sections of this report discuss our preliminary findings and conclusion.

3.1 LANDSLIDES

As previously described in Section 2.9, there are several deep-seated bedrock landslides that we observed and mapped within the development area. These landslides may impact and damage the proposed development and improvements if not properly addressed. The current conceptual site plan depicts some of the proposed development areas to be situated adjacent to existing deep-seated landslides.

It is our experience that there are numerous mitigation approaches to stabilizing landslide hazards, which each pose various risks to the planned development areas. To determine suitable and feasible stabilization methods for a given landslide, project constraints should be considered. These may include property boundaries, existing structures and site improvements, sensitive vegetation, and habitat areas, etc. Depending on the landslide location, depth, and activity level (ancient, dormant, or actively moving landslide) with respect to planned development areas, there may be increased risk during construction of repairs where destabilization could trigger movement of the landslide. This risk is especially present during repair efforts at the toe of a landslide, as excavation at the toe reduces the resisting force of the landslide.

Some feasible repair concepts for landslides may include:

- Partial or full landslide removal and reconstruction
- Filling along lower portions to create buttress and catchment areas
- Reducing the driving force of the landslide by removing mass along the landslide crest and rebuilding the upper portion to protect development areas
- Dewatering measures
- Structural solutions to retain or strengthen weak landslide materials

In general, it is possible to reduce construction risk by taking measures to stabilize the slope throughout construction, using methods such as dewatering the slope, buttressing the landslide toe, and unloading the landslide crest. In contrast, construction methods that decrease slope stability may increase construction risk, such as excavating cut near the landslide toe, adding mass to the landslide crest, or allowing additional water to enter the slope.

Where repairs are not feasible, then hazard avoidance, safe setbacks for development areas and protective measures may be considered. Based on the relationship of the various landslides to planned development areas, a variety of these repair concepts may be planned for the planned development areas as described in this report in Table 3.1-1.

TABLE 3.1-1: Landslides Adjacent to the Proposed Development

LANDSLIDE	TYPE	DESIGN RECOMMENDATIONS
1	Deep-Seated Translational Bedrock Landslide	Corrective grading, OR Setback from crest, OR Structural retention
2	Possible Deep-Seated Translational Bedrock Landslide *	Minimal Grading For Access Roads Crossing Lower Portion OR None if avoided
3	Deep-Seated Translational Bedrock Landslide	Setback from toe AND/OR Corrective grading AND/OR Structural retention
4	Earthflow	Corrective grading OR None if avoided

*May be further evaluated during design level study

Grading considerations and design recommendations are further discussed in Section 4.0.

3.2 EXPANSIVE SOIL

We observed expansive lean clay, fat clay, clayey sand, and claystone near the surface of the development area in our borings and test pits. Our laboratory testing indicates that this soil exhibits high to critically high shrink/swell potential with variations in moisture content.

Expansive soil changes in volume with changes in moisture. It can shrink or swell and cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Building damage due to volume changes associated with expansive soil can be reduced by: (1) using a rigid mat foundation that is designed to resist the settlement and heave of expansive soil, (2) deepening the foundations to below the zone of moisture fluctuation (i.e. by using deep footings or drilled piers), and/or (3) using footings at normal shallow depths but bottomed on a layer of select fill having a low-expansion potential.

If the third option is preferred, it may be practical to consider import of non-expansive soil to underly the building pads due to the limited amount of non-expansive material observed on the site during our exploration. For planning purposes, we consider that the upper 36 inches of soil below building pads and extending laterally 5 feet outside of building footprints be replaced with non-expansive soil. In lieu of importing non-expansive fill, it may be cost effective to lime treat the upper 18 inches of the building pad to reduce the expansion potential of the on-site soil.

3.3 EXISTING ARTIFICIAL FILL

Our test pits and review of historical aerial photos and topographic maps indicate that portions of the development area are underlain by existing undocumented “man-made” fill. Undocumented fill may undergo excessive settlement, especially under new fill or building loads. Additionally, existing undocumented fill may be subject to seismic slope instability.

3.4 POTENTIALLY COMPRESSIBLE SOIL

Our test pits and borings indicate that portions of the development area are underlain by colluvium and alluvium comprised of lean and fat clay with varying amounts of sand and gravel. Soft and medium stiff clay may be potentially compressible and may exhibit excessive settlement under building loads.

3.5 EXCAVATION AND RIPPABILITY OF STRONG IN-PLACE BEDROCK

Where silica-carbonate rock or ultramafic rock are encountered during grading, difficult ripping is expected even when using the largest available grading equipment. It is anticipated that these areas will produce oversize boulders that may require special treatment.

The siltstone, sandstone, and claystone of the Great Valley Sequence (Kgv) encountered in our field exploration was found to generally be moderately to slightly weathered in our test pits, except in landslide areas, where it was more highly weathered. Difficult drilling conditions in the Great Valley Sequence bedrock were encountered near the Hunter Hill Landslide during construction of the drainage gallery (Caltrans, 2008). Heavy duty grading and backhoe equipment are anticipated to be capable of excavating and trenching siltstone with moderate to high effort. Local areas of harder and less weathered rock should be expected.

Additional recommendations can be provided once the extent of proposed grading is planned, and additional exploration is performed.

3.6 SERPENTINITE BEDROCK

As previously described, silica-carbonate bedrock is part of an ultramafic rock sequence, which may also locally contain other ultramafic rocks and minerals, including serpentinite. While most site grading is expected to occur within Great Valley Sequence bedrock, some grading and cut may be expected in silica-carbonate rock as well, especially along the eastern portion of the development area. Grading activities and cut in areas mapped as silica-carbonate rock may locally encounter serpentinite.

Serpentinite sometimes contains the mineral chrysotile, a fibrous asbestos mineral. Asbestos is considered hazardous when it becomes airborne, which may occur during excavation and grading activities in dry conditions. We recommend that during future exploration on the site, that soil and/or bedrock samples be collected from potential cut areas in silica-carbonate rock, ideally from the depths of proposed cut. Laboratory testing of these samples should then be performed to determine if the soil/rock samples contain asbestos. Depending on the results of this testing, special measures may be needed during grading to manage the potential hazards. Measures of this type can be costly and include air/dust monitoring and intensive dust control measures.

3.7 GROUNDWATER AND SURFACE WATER

It does not appear that the static groundwater level beneath the development area is likely to affect the proposed development. However, water from the springs is known to flow as surface water through existing drainages, which overlap with or lie adjacent to some of the proposed development areas at the site. The locations of the springs are shown in the Site Plan, Figures 2A and 2C. Water flowing through the drainages may also lead to local areas of perched groundwater. Perched groundwater and surface water near the proposed developments or site improvements can:

1. Impede grading activities.
2. Cause moisture damage to sensitive floor coverings.
3. Transmit moisture vapor through slabs causing excessive mold/mildew build-up, fogging of windows, and damage to computers and other sensitive equipment.
4. Cause premature pavement or foundation failure by erosion of pavement subgrades.
5. Lead to slope instability by erosion of the toes of existing or planned slopes.

The civil engineer should review the existing spring locations and provide appropriate design recommendations to address spring water and drainages flowing from the springs.

3.8 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking and ground lurching. The following sections present a discussion of these hazards as they apply to the development area. Based on topographic and lithologic data, the risk of regional subsidence or uplift, lateral spreading, tsunamis, flooding, or seiches is considered low to negligible at the site.

3.8.1 Ground Rupture

A concealed surface trace of the Lake Herman Fault crosses a portion of the site, as shown in the Site Plan, Figures 2A and 2C. However, the Lake Herman Fault is not known to be active, and is not included on the USGS list of Quaternary Faults anticipated to cause ground rupture. Additionally, the site is not located within the Earthquake Fault Special Study Zone (A-P Zone). Therefore, it is our opinion that ground rupture is unlikely at the project site.

3.8.2 Ground Shaking

An earthquake of moderate to high magnitude generated within the San Francisco Bay region could cause considerable ground shaking at the site, like that which has occurred in the past. Structures should be designed using sound engineering judgment and the 2022 California Building Code (CBC) requirements, as a minimum. Seismic design provisions of current building codes generally prescribe minimum lateral forces, applied statically to the structure, combined with the gravity forces of dead and live loads. The code-prescribed lateral forces are generally considered to be substantially smaller than the comparable forces that would be associated with a major earthquake. Therefore, structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage, but with some non-structural damage, and (3) resist major earthquakes without collapse but with some structural, as well as non-structural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a well-designed and well-constructed structure will not collapse or cause loss of life in a major earthquake (SEAOC, 1996).

3.8.3 Liquefaction

Soil liquefaction results from loss of strength during cyclic loading, such as imposed by earthquakes. Soil most susceptible to liquefaction is clean, loose, saturated, uniformly graded, fine-grained sand. The soil encountered in our borings and test pits generally consisted of clay with variable amounts of sand and gravel.

Where we encountered minor sand and gravel in our borings, the deposits appeared to be discontinuous and comprised of angular rock fragments mixed with sand and clayey fines. In addition, groundwater was not encountered within coarse-grained soil layers in our borings. For these reasons and based upon engineering judgment, it is our opinion that the potential for liquefaction in the development area is low during seismic shaking.

3.8.4 Ground Lurching

Ground lurching is a result of the rolling motion imparted to the ground surface during energy released by an earthquake. Such rolling motion can cause ground cracks to form in weaker soil. The potential for the formation of these cracks is considered greater at contacts between deep alluvium and bedrock. Such an occurrence is possible at the site as in other locations in the Bay Area region, but based on the site location, it is our opinion that the offset is expected to be minor. We provide preliminary recommendations for remedial grading, foundation, and pavement design in this report that are intended to reduce the potential for adverse impacts from lurch cracking.

3.8.5 Earthquake-Induced Landslides

Numerous landslides have been mapped on the site, as discussed in Section 2.9. Ground shaking associated with earthquake events can trigger new landslides or remobilization of the existing landslides in weak geologic materials caused by a wide range of mechanisms. Due to the presence of existing landslides on and near the site, and the overall topography of the site, the potential for earthquake-induced landslides is considered high. Preliminary recommendations to address this geologic hazard are discussed in later sections of this report.

3.8.6 2022 CBC Seismic Design Parameters

The 2022 CBC utilizes seismic design criteria established in the ASCE/SEI "Standard Minimum Design Loads and Associated Criteria for Buildings and Other Structures," (ASCE 7-16). Based on the subsurface conditions encountered and mapping by Willis 2015, we characterized the development area as both Site Class B and Site Class C. Areas mapped as silica-carbonate rock or Great Valley Sequence rock are classified as Site Class B, while areas underlain by colluvium may be classified as Site Class C. We recommend that further geotechnical testing be performed beneath proposed building locations during the design-level study to confirm and refine these classifications.

We anticipate that the proposed casino structure may be Risk Category III, while the proposed residential area will be Risk Category II. However, we note that the mapped seismic parameters do not change between a Risk Category II and III structure for either site class. In Table 3.8.6-1 below, we provide the CBC seismic parameters based on the ASCE Hazard Tool for your use.

TABLE 3.8.6-1: 2022 CBC Seismic Design Parameters, Latitude: 38.144326 Longitude: -122.215092

PARAMETER	VALUE			
Risk Category	II	II	III	III
Site Class	B	C	B	C
Mapped MCE_R Spectral Response Acceleration at Short Periods, S_S (g)	1.868	1.868	1.868	1.868
Mapped MCE_R Spectral Response Acceleration at 1-second Period, S_1 (g)	0.652	0.652	0.652	0.652
Site Coefficient, F_a	0.9	1.2	0.9	1.2
Site Coefficient, F_v	0.8	1.4	0.8	1.4
MCE_R Spectral Response Acceleration at Short Periods, S_{MS} (g)	1.681	2.241	1.681	2.241
MCE_R Spectral Response Acceleration at 1-second Period, S_{M1} (g)	0.522	0.913	0.522	0.913
Design Spectral Response Acceleration at Short Periods, S_{DS} (g)	1.121	1.494	1.121	1.494
Design Spectral Response Acceleration at 1-second Period, S_{D1} (g)	0.348	0.609	0.348	0.609
Mapped MCE Geometric Mean (MCE_G) Peak Ground Acceleration, PGA (g)	0.771	0.771	0.771	0.771
Site Coefficient, F_{PGA}	0.9	1.2	0.9	1.2
MCE_G Peak Ground Acceleration adjusted for Site Class effects, PGA_M (g)	0.694	0.925	0.694	0.925
Long period transition-period, T_L (sec)	8	8	8	8

4.0 PRELIMINARY GRADING CONSIDERATIONS

Conceptual site layouts for Alternatives A, B, and C are shown in Exhibits 1.3-1 through 1.3-3.

4.1 ALTERNATIVE A – PROPOSED PROJECT

4.1.1 Northern Development Area – Residential

Alternative A of the conceptual development plans shows a residential development in the northern-central portion of the development area. Appropriate geotechnical design measures must be designed and implemented to allow residential structures, fill, pedestrian improvements, roads, and landscaping within 100 feet of the crest of the Hunter Hill Landslide as depicted in the Site Plan, Figures 2B and 2D. Remedial measures will be either minor or not required if the development is moved outside the 100-foot setback. We anticipate that a remedial grading solution may be appropriate for treatment of this area. This would include removal of the existing landslide deposits downslope of the proposed improvements, and construction of a keyway and benched fill.

Typical keyway designs consist of 30-foot-wide keyways constructed to a minimum depth of 5 feet, or extending below existing fill, colluvium, or landslide deposits and at least 3 feet into competent native bedrock, whichever is deeper. Subsurface drainage systems should be installed within the keyways and benched fill. We present a typical keyway section in Figure 6, and a typical subdrain detail in Figure 7. Engineered fill may need to be reinforced with geogrid to provide additional strength.

Structural solutions may also be considered.

4.1.2 Northern Development Area – Access Road

Alternative A of the conceptual development plans shows the grading limits for the access road approaching the extents of Landslide 2, as shown in the Site Plan, Figure 2B. We recommend that proposed roads, utilities, improvements, and cuts in this area be constructed outside of the mapped landslide extents. It is acceptable to place fill near or on the landslide toe.

4.1.3 Central Development Area – Casino

Alternative A of the conceptual plans shows a casino development in the central portion of the development area, at the toe of the Eastern Landslide Complex. We recommend that any proposed structures, roads, pedestrian improvements, utilities, or cut in this area be set back a distance of at least 150 feet from the toe of this landslide to reduce the potential for adverse impacts from landslide activity.

It is feasible to construct a portion of the development within the setback area if other appropriate measures are designed and implemented to reduce the hazard. Where drainage swales are planned, we recommend that they be made of concrete or be lined with an impervious liner within the landslide and setback areas to reduce water infiltration near the landslide area. The swales may be earthen where they are outside of the setback areas. We provide a conceptual summary of potential design options below for planning purposes. These options should be preliminarily incorporated into project planning and evaluated for slope stability during the design-level study.

TABLE 4.1.3-1: Central Casino Development Potential Design Measures

SETBACK	CONCEPTUAL DESIGN MEASURES
150 feet	• Avoid cut within the building pad • Place fill and raise grades across landslide toe • Construct buttress across landslide toe outside of building footprint
100 feet	• Place fill and raise grades across landslide toe • Minimum pad grade elevation of approximately 285 feet (NAVD 88) • Construct buttress across landslide toe outside of building footprint • Construct deflection berm or wall • Partial removal and replacement of landslide deposits with benched fill and subdrain system
< 100 feet	• Place fill and raise grades across landslide toe • Minimum pad grade elevation of approximately 305 feet (NAVD 88) • Construct deflection berm • Construct debris bench • Construct shear key into rock below landslide deposits, up to 70 feet deep • Fully remove and replace landslide deposits with benched fill and subdrain system • Potential additional structural solutions

Additional explorations should be conducted in this area during the design-level study to assess whether alluvial and colluvial soil in this area is compressible beneath the proposed building loads. Depending on the extent of compressible soil encountered, a remedial grading solution involving removal and replacement of compressible soil with engineered fill may be feasible. Alternatively, ground improvement may be considered for this area. Deep foundations may be appropriate for some portions of the development area; however, we consider a shallow foundation system to be preferred on sloped grades and near the Eastern Landslide Complex toe.

4.1.4 Southwestern Borrow Area and Utilities

A borrow pit is shown in the southwestern corner of the development area. We also understand that other utilities may be planned on top of the borrow area. The borrow pit extents do not overlap with Landslide 4. Additionally, due to the shallow nature of Landslide 4, a setback is not required for grading or borrowing activities. We consider the southwestern corner of the development area and borrow pit to be generally suitable for construction of additional improvements, so long as design-level grading considerations are taken into account.

4.2 ALTERNATIVE B – REDUCED INTENSITY ALTERNATIVE

4.2.1 Central Development Area – Casino

Refer to recommendations for Alternative A for this area.

4.3 ALTERNATIVE C – NON-GAMING ALTERNATIVE

4.3.1 Central Development Area – Residential

Alternative C of the conceptual plans shows a residential development in the central portion of the development area, at the toe of the Eastern Landslide Complex. We recommend that any proposed development in this area be set back a distance of at least 150 feet from the toe of this landslide to reduce the potential for adverse impacts from landslide activity.

We understand that some of the roads and residential structures are planned within the 150-foot setback. It is feasible to construct a portion of the development within the setback area if other appropriate measures are designed and implemented to reduce the hazard. We provide a conceptual summary of potential design options in Table 4.1.3-1 for planning purposes. These options should be preliminarily incorporated into project planning and evaluated for slope stability during the design-level study.

4.3.2 Southwestern Development Area – Hotel

Alternative C of the conceptual plans shows a hotel development in the southwestern portion of the development area. This area is primarily underlain by a bedrock cut and is adjacent to Landslide 4.

Remedial grading will be required in this area. This would include removal of the existing landslide deposits at Landslide 4 downslope of the proposed improvements, and potential construction of a keyway, subdrains, and benched fill depending on the depths of the landslide deposits. We present a typical keyway section in Figure 6, and a typical subdrain detail in Figure 7. Engineered fill may need to be reinforced with geogrid to provide additional strength.

4.3.3 Southern Development Area – Commercial

Alternative C of the conceptual plans shows a commercial development in the southern portion of the development area. This area is underlain by colluvium and alluvium.

Additional explorations should be conducted in this area during the design-level study to assess whether alluvial and colluvial soil in this area is compressible beneath the proposed building loads. Depending on the extent of compressible soil encountered, a remedial grading solution involving removal and replacement of compressible soil with engineered fill may be feasible. Alternatively, deep foundations or ground improvement may be considered for this area.

4.4 LEE PROPERTY – ACCESS ROADS

All of the alternatives show access roads to the project site entering through the Lee Property to the southeast of the project development area, north of Columbus Parkway. As discussed in Section 2.9.4, the toe of the Eastern Landslide Complex extends into the Lee Property. Access roads should be set back at least 200 feet from the toe of the landslide, unless appropriate geotechnical design measures are designed and implemented to further stabilize it. The setback is shown in Figures 2A through 2D. The access road locations are shown in Figures 2B and 2D.

We provide a conceptual summary of potential design options below for planning purposes. These options should be preliminarily incorporated into project planning and evaluated for slope stability during the design-level study.

TABLE 4.4-1: Access Road – Lee Property Potential Design Measures

SETBACK	CONCEPTUAL DESIGN MEASURES
200 feet	• Avoid cut within the setback area • Place fill and raise grades across landslide toe • Construct buttress upslope of roadway
< 200 feet	• Place fill and raise grades across landslide toe • Construct buttress and deflection berm upslope of roadway • Construct debris bench • Construct shear key into rock below landslide deposits • Partially or fully remove and replace landslide deposits with benched fill and subdrain system • Potential additional structural solutions

4.5 GUIDELINES FOR GRADED SLOPES

In general, the following slope gradient guidelines may be applied for preliminary grading design of both permanent cut and fill slopes. The contractor is responsible to construct temporary construction slopes in accordance with Cal/OSHA requirements. Slopes steeper than 3:1 (horizontal:vertical) should be constructed with drainage benches at widths and intervals as recommended in the current California Building Code.

TABLE 4.5-1: Slope Specifications

ALLOWABLE SLOPE GRADIENT (horizontal:vertical)	MAXIMUM ALLOWABLE SLOPE HEIGHT (feet)	
	GENERAL FILL	BEDROCK CUT
2:1	10	10
2½:1	15	20
3:1	>15	>20

Depending on materials used to construct fill slopes or rebuild cut slopes, it may be necessary to incorporate additional slope stabilization techniques such as the use of geogrid reinforcement within the slope to enhance long-term stability.

4.6 CUT/FILL TRANSITION LOTS AND CUT LOTS

Some structures in the proposed development may be entirely in cut or traversed by a cut-fill grading transition. We anticipate that significant variations in material properties may occur in areas of cut or cut-and-fill daylighting if not addressed during site grading. As such, we recommend cut portions of transition building pads be overexcavated and the excavated materials replaced with properly compacted engineered fill. This can be accomplished by subexcavating the natural soil cover and the native rock and replacing the subexcavated material with engineered fill. The subexcavation depth should be 3 feet for cut-fill transition building pads on residential lots. In addition, cut residential building areas should be overexcavated and reworked to at least 3 feet below rough pad grade. A typical cut lot pad detail is presented in Figure 8. A typical cut-fill transition section detail is presented in Figure 9. A typical fill lot pad detail is presented in Figure 10.

4.7 DIFFERENTIAL FILL THICKNESS

Differential building movements may result from conditions where building pads have significant differentials in fill thickness. For planning purposes, we recommend that differentials in fill thickness under buildings should not exceed 15 percent (i.e. less than 15 feet over a 100-foot length). Actual allowable differential fill thickness may vary depending on the foundation system selected for the proposed structures. The extent and depths of local subexcavation should be determined once design-level grading plans are available.

The purpose of this requirement is to limit differential fill settlement and/or swell under buildings. Local subexcavation of natural materials and replacement by engineered fill may be necessary to comply with the final differential fill thickness requirement.

4.8 ACCEPTABLE FILL

On-site soil and rock material is suitable as fill material provided it is processed to remove concentrations of organic material, debris, and particles greater than 6 inches in maximum dimension.

4.9 SUBSURFACE DRAINAGE

Subsurface drainage systems should be installed in keyways and swales or natural drainage areas. Typical keyway subdrains are shown in Figure 7. In addition, where cut or fill slopes over 5 feet high are positioned uphill of proposed residential or commercial lots, we recommend a lot subdrain be installed at the toe of the slope. The lot subdrains are designed to divert water from natural seepage along cut slopes and water migration due to irrigation and rainwater.

Subdrains should also be designed and implemented to redirect water from existing springs and seeps on the site around the proposed development and improvement areas.

4.10 STORMWATER INFILTRATION

Due to the high clay content of colluvium and alluvium, the near-surface site soil is expected to have a low to moderate permeability value for stormwater, unless subdrains are installed. Great Valley Sequence bedrock is also anticipated to have low to moderate infiltration potential, which may reduce over time as fractures in the rock fill up with water. Therefore, best management practices should assume that limited stormwater infiltration will occur at the site. Percolation testing at the proposed stormwater sites may help to further refine infiltration rate estimates.

If stormwater infiltration areas are still planned for the site, they should be located away from slopes and existing landslides, as increased groundwater levels may contribute to slope instability. They should also be located more than 10 feet away from proposed building footprints and more than 5 feet away from other proposed improvements to limit the impact of shrink and swell of surrounding soil on building foundations and pavements.

4.11 PAVEMENTS

For preliminary planning of residential streets and thruways, we provide the following recommended pavement sections (based on a preliminary R-value of 5) for traffic indices of 5.0 through 8.0 in accordance with methods prescribed in Topic 608 of Highway Design Manual by Caltrans.

TABLE 4.11-1: Recommended Pavement Sections

TRAFFIC INDEX	AC (inch)	AB (inch)
5.0	3	11
6.0	3 ½	14
7.0	4	16
8.0	5	18

Notes: AC is asphaltic concrete
AB is aggregate base Class 2 Material with minimum R = 78

The sections above should be considered for estimating purposes only. The traffic index should be determined by the civil engineer or appropriate public agency. Actual pavement sections for design should be based on R-value tests performed on samples of actual subgrade materials recovered at the time of grading.

5.0 PRELIMINARY FOUNDATION RECOMMENDATIONS

We anticipate that a shallow foundation system, such as a concrete mat foundation or a post-tensioned slab, will be suitable to support both the casino and the proposed residential structures, provided that appropriate remedial grading measures are performed at the site. There may be cases where deep foundations are more suitable for some areas of the development area.

As discussed in Section 3.2, shallow foundation system design should incorporate measures to address highly expansive soil.

6.0 PRELIMINARY RETAINING WALL RECOMMENDATIONS

Retaining walls are planned for each alternative site layout. Alternative A shows one wall retaining cut into soil and rock up to 20 feet high in the northern development area. For Alternatives A and B, walls up to approximately 25 feet tall may also be required to retain fill below the casino building pads, which would be integral to the casino structure. Alternative C shows eight walls retaining cut between 10 and 50 feet in height, which will likely retain native soil and bedrock.

Where retaining walls are planned below building pads and are not integral to the building structure, the building pad should be at least 15 feet away from the back of the wall.

In general, where retaining walls are planned for cut into native soil and bedrock, an anchored wall (such as a soil nail or tieback wall) is an appropriate wall type. Where walls are planned to retain fill or are integral to a structure, cast-in-place walls will likely be more feasible.

7.0 DESIGN-LEVEL GEOTECHNICAL STUDIES

Design-level geotechnical studies should be performed as a part of the design phase of the project. This is anticipated to include additional subsurface investigations beneath the proposed development areas and improvements, laboratory testing, engineering analysis, consultation with the design team, and reporting of conclusions and design-level recommendations for the development.

Due to the complex geology and hillside topography, we also recommend that a corrective grading plan be developed along with the design-level study. This will be important to clarify our geotechnical recommendations related to keyways, benches, cut/fill transition subexcavation, and subdrains. In preparing these plans, we intend to overlay the grading plans with graphic representations of our grading and subsurface drainage recommendations presented in this report. This allows the unique hillside geotechnical recommendations to be clearly displayed on the grading plans. This can assist in obtaining more accurate earthwork bids, as well as clarifying the geotechnical recommendations as they apply to the final grading plan.

We recommend that the design-level study include the following scope of services, at a minimum. Optional additional scope items are also included below, which may be beneficial to other aspects of design of the proposed development.

<u>Recommended Scope</u>:

- Additional mud-rotary borings with rock coring within the footprint of the proposed building locations to confirm depth of fill, colluvial/alluvial soil, and landslide deposits, and to collect samples for laboratory testing.
- Additional test pits and/or trenches to further constrain geometry of existing landslides and confirm depth of fill and colluvial/alluvial soil.
- Soil sample collection at depths relevant to foundation design.
- Laboratory testing, including, but not limited to, moisture content, unit weight, gradation, Atterberg Limits, R-value, strength including remolded and residual strength, and corrosivity testing.
- Design-level assessment of geologic and geotechnical hazards, including, but not limited to:
  - Characterization of subsurface conditions
  - Static and pseudo-static slope stability analysis of up to three critical cross sections
  - Recommendations for treatment of expansive soil
- Preparation of a remedial grading plan.
- Design recommendations for foundation system design.
- Design recommendations for retaining wall design.
- Foundation constructability recommendations.
- Design-level earthwork and improvement design and construction recommendations.

Alternate Future Studies (Optional):

- Site-specific ground-motion studies for the proposed casino structure.
- Site-specific infiltration testing at proposed locations if they are planned.
- Sampling and testing of silica-carbonate rock for asbestos.
- Geophysical testing to further characterize bedrock rippability.
- Construction of a groundwater test well and implementation of a groundwater pump test.

8.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report presents geotechnical recommendations for design of the improvements discussed in Section 1.3 for the Scotts Valley Development project. If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional recommendations, if any. It is the responsibility of the owner to transmit the information and recommendations of this report to the appropriate organizations or people involved in design of the project, including but not limited to developers, owners, buyers, architects, engineers, and designers. The conclusions and recommendations contained in this report are solely professional opinions and are valid for a period of no more than 2 years from the date of report issuance.

We strive to perform our professional services in accordance with generally accepted principles and practices currently employed in the area; there is no warranty, express or implied. There are risks of earth movement and property damages inherent in building on or with earth materials. We are unable to eliminate all risks; therefore, we are unable to guarantee or warrant the results of our services.

This report is based upon field and other conditions discovered at the time of report preparation. We developed this report with limited subsurface exploration data. We assumed that our subsurface exploration data are representative of the actual subsurface conditions across the site. Considering possible underground variability of soil and groundwater, additional costs may be required to complete the project. We recommend that the owner establish a contingency fund to cover such costs. If unexpected conditions are encountered, ENGEO must be notified immediately to review these conditions and provide additional and/or modified recommendations, as necessary.

Our services did not include excavation sloping or shoring, soil volume change factors, or flood potential. In addition, our geotechnical exploration did not include work to determine the existence of possible hazardous materials. If any hazardous materials are encountered during construction, the proper regulatory officials must be notified immediately.

This document must not be subject to unauthorized reuse, that is, reusing without written authorization of ENGEO. Such authorization is essential because it requires ENGEO to evaluate the document's applicability given new circumstances, not the least of which is passage of time.

Actual field or other conditions will necessitate clarifications, adjustments, modifications, or other changes to ENGEO's documents. Therefore, ENGEO must be engaged to prepare the necessary clarifications, adjustments, modifications, or other changes before construction activities commence or further activity proceeds. If ENGEO's scope of services does not include on-site construction observation, or if other persons or entities are retained to provide such services, ENGEO cannot be held responsible for any or all claims arising from or resulting from the performance of such services by other persons or entities, and from any or all claims arising from or resulting from clarifications, adjustments, modifications, discrepancies, or other changes necessary to reflect changed field or other conditions.

We determined the lines designating the interface between layers on the exploration logs using visual observations. The transition between the materials may be abrupt or gradual. The exploration logs contain information concerning samples recovered, indications of the presence of various materials such as clay, sand, silt, rock, existing fill, etc., and observations of groundwater encountered. The field logs also contain our interpretation of the subsurface conditions between sample locations. Therefore, the logs contain both factual and interpretative information. Our recommendations are based on the contents of the final logs, which represent our interpretation of the field logs.

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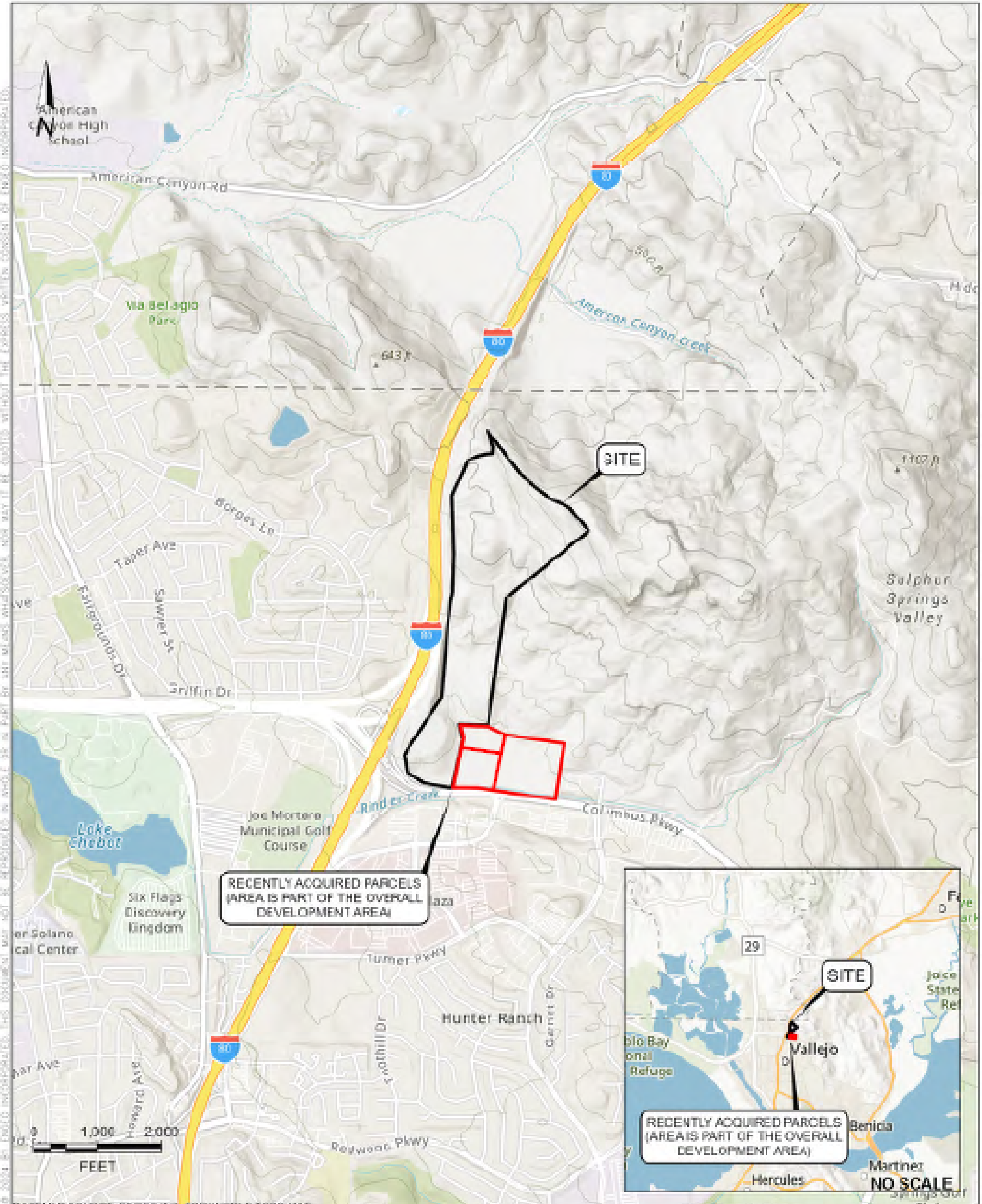
FIGURES



ENGEO Expect Excellence	VICINITY MAP VALLEJO SCOTTS VALLEY VALLEJO, CALIFORNIA	PROJECT NO.: 16484.000.001 SCALE: AS SHOWN DRAWN BY: NVC CHECKED BY: JBR	FIGURE NO. 1

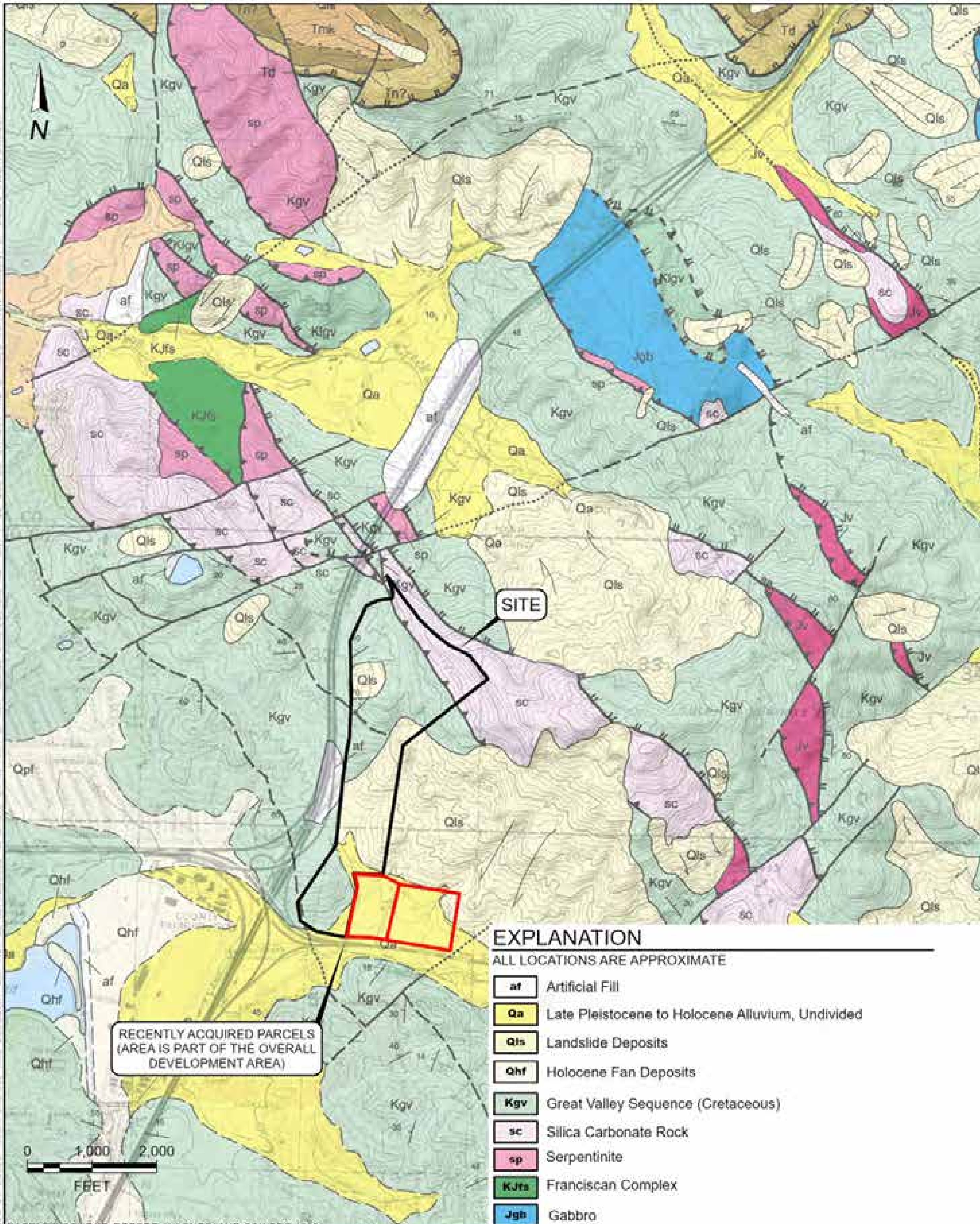
ORIGINAL FIGURE PRINTED IN COLOR


A
A'
B
B'
2A


Hunter Hill Landslide
Eastern Slide Complex
Kgv
Qls
Qc
SC
EXPLANATION
ENGEO
2B


A
A'
B
B'
Hunter Hill Landslide
Eastern Slide Complex
EXPLANATION
ENGEO
SITE PLAN - ALTERNATIVE C
2C


Hunter Hill Landslide
Eastern Slide Complex
EXPLANATION
2D



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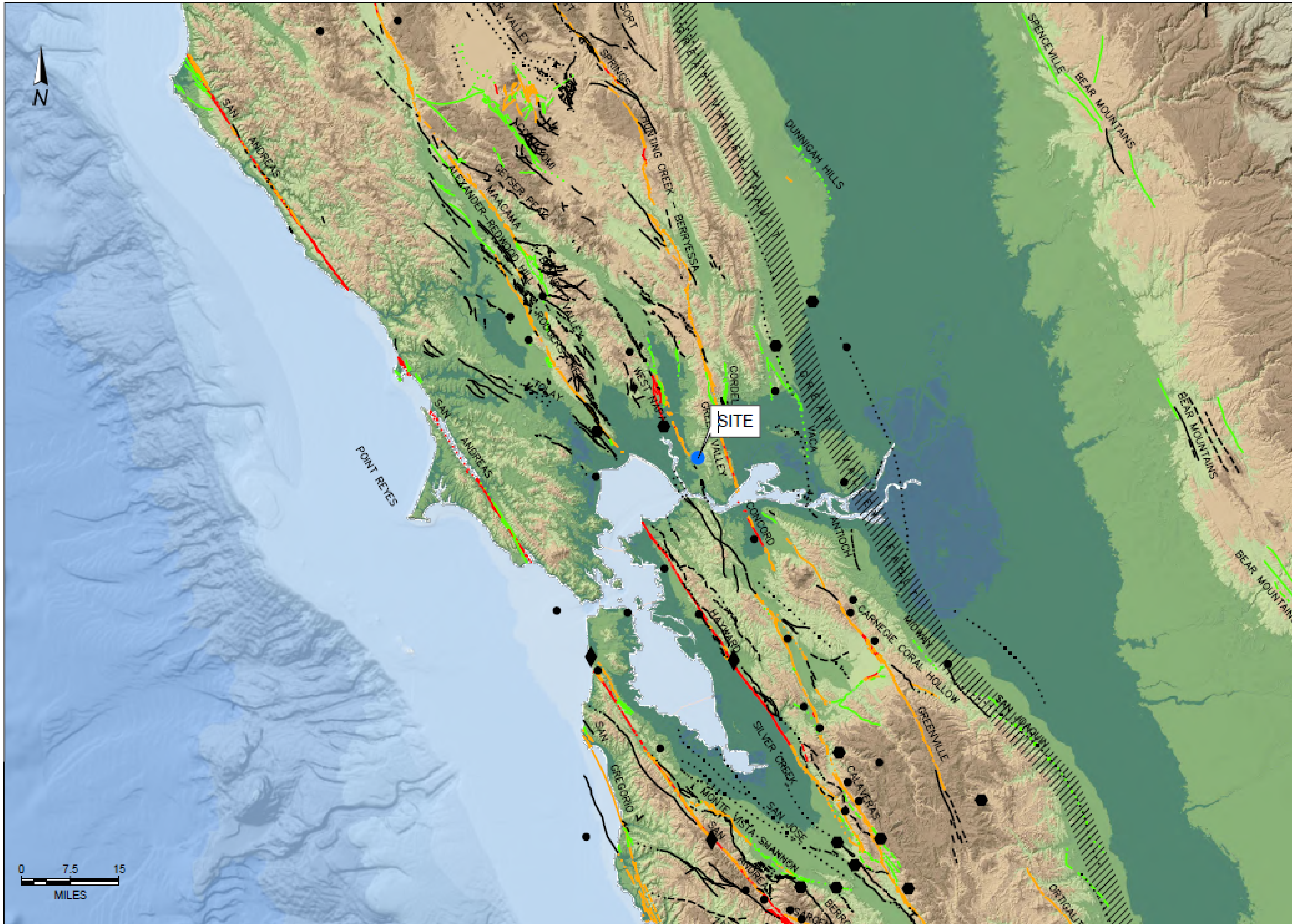
REGIONAL GEOLOGIC MAP
VALLEJO SCOTTS VALLEY
VALLEJO, CALIFORNIA

PROJECT NO.: 16484.000.001		FIGURE NO.
SCALE: AS SHOWN		3
DRAWN BY: NWC	CHECKED BY: JBR	

ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

- Project Site

HISTORIC EARTHQUAKE EPICENTERS

- Magnitude 5-6
- Magnitude 6-7
- Magnitude 7+
- Historic Blind Thrust Fault Zone

QUATERNARY FAULTS 2020

Based on time of most recent surface deformation

- Historical (<150 Years), Well Constrained Location
- Historical (<150 Years), Moderately Constrained Location
- Historical (<150 Years), Inferred Location
- Latest Quaternary (<15,000 Years), Well Constrained Location
- Latest Quaternary (<15,000 Years), Moderately Constrained Location
- Latest Quaternary (<15,000 Years), Inferred Location
- Latest Quaternary (<15,000 Years), Inferred Location
- Late Quaternary (<130,000 Years), Moderately Constrained Location
- Late Quaternary (<130,000 Years), Inferred Location
- Middle And Late Quaternary (<750,000 Years), Well Constrained Location
- Middle And Late Quaternary (<750,000 Years), Moderately Constrained Location
- Middle And Late Quaternary (<750,000 Years), Inferred Location
- Undifferentiated Quaternary(<1.6 Million Years), Well Constrained Location
- Undifferentiated Quaternary(<1.6 Million Years), Moderately Constrained Location
- Undifferentiated Quaternary(<1.6 Million Years), Inferred Location
- Class B (Various Age), Well Constrained Location
- Class B (Various Age), Moderately Constrained Location
- Class B (Various Age), Inferred Location

BASE MAP SOURCE:
CSUMB, ESRI, GARMIN, NATURALVUE, ESRI, GEBCO, GARMIN, NATURALVUE
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATA SET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, 2020
C.G.S. HISTORIC EARTHQUAKE DATABASE

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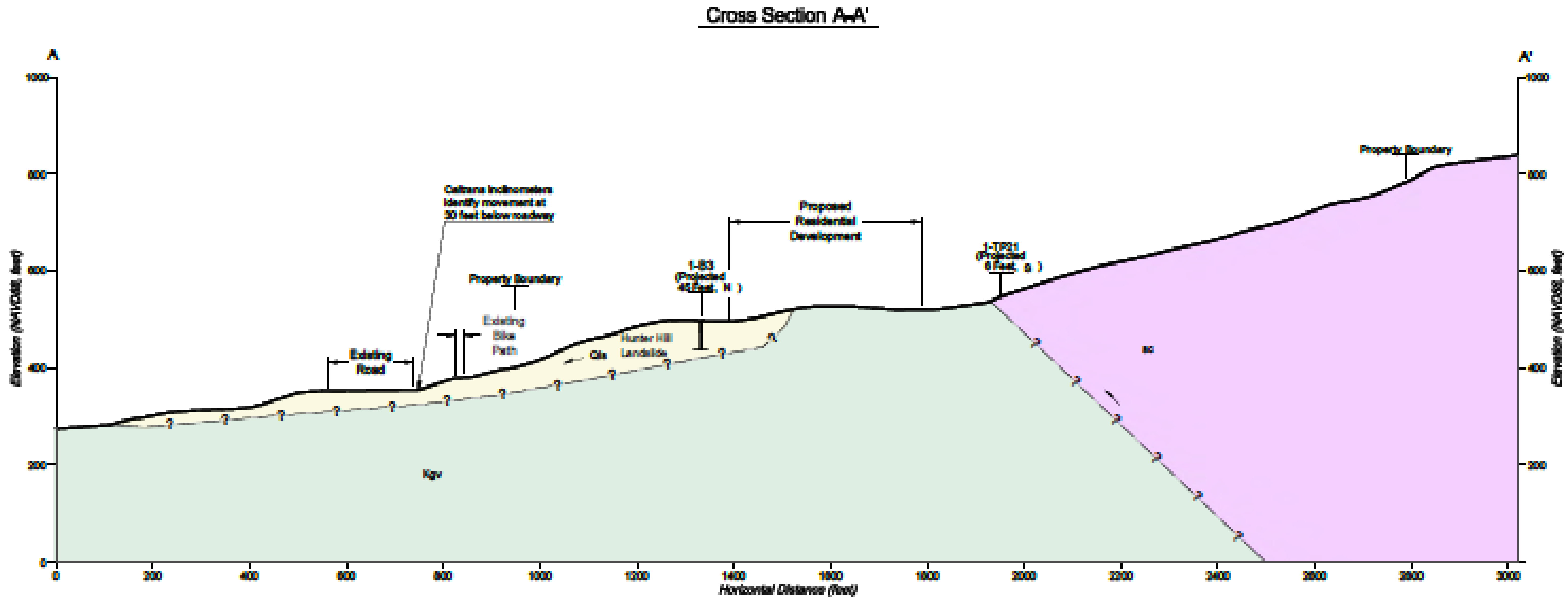
REGIONAL FAULTING AND SEISMICITY MAP

VALLEJO SCOTTS VALLEY

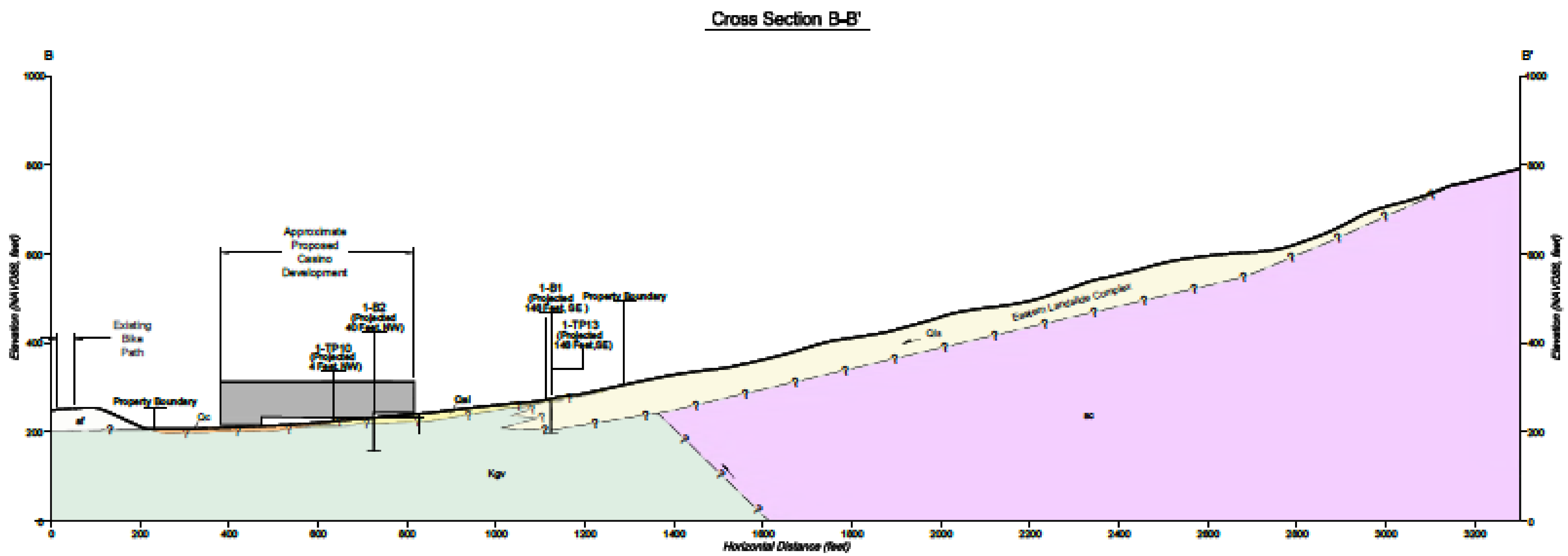
VALLEJO, CALIFORNIA

78484.000.001	4
AS SHOWN	
LL	JBR

Cross Section A-A'



Cross Section B-B'



Legend

- af — Artificial Fill
- Qal — Alluvium
- Qc — Colluvium
- Qls — Landslide deposits
- Kgv — Great Valley Sequence
- sc — Silica Carbonate Rock
- 1-B3 — Boring (ENGEO, 2024)
- 1-TP21 — Boring (ENGEO, 2024)
- Existing Ground Surface
- Geologic Contact, dashed where approximate queried where inferred

Disclaimer: Cross Section Is For Illustration Purposes Only. The Transition Between Materials May Be Abrupt Or Gradual. Variations Should Be Expected.

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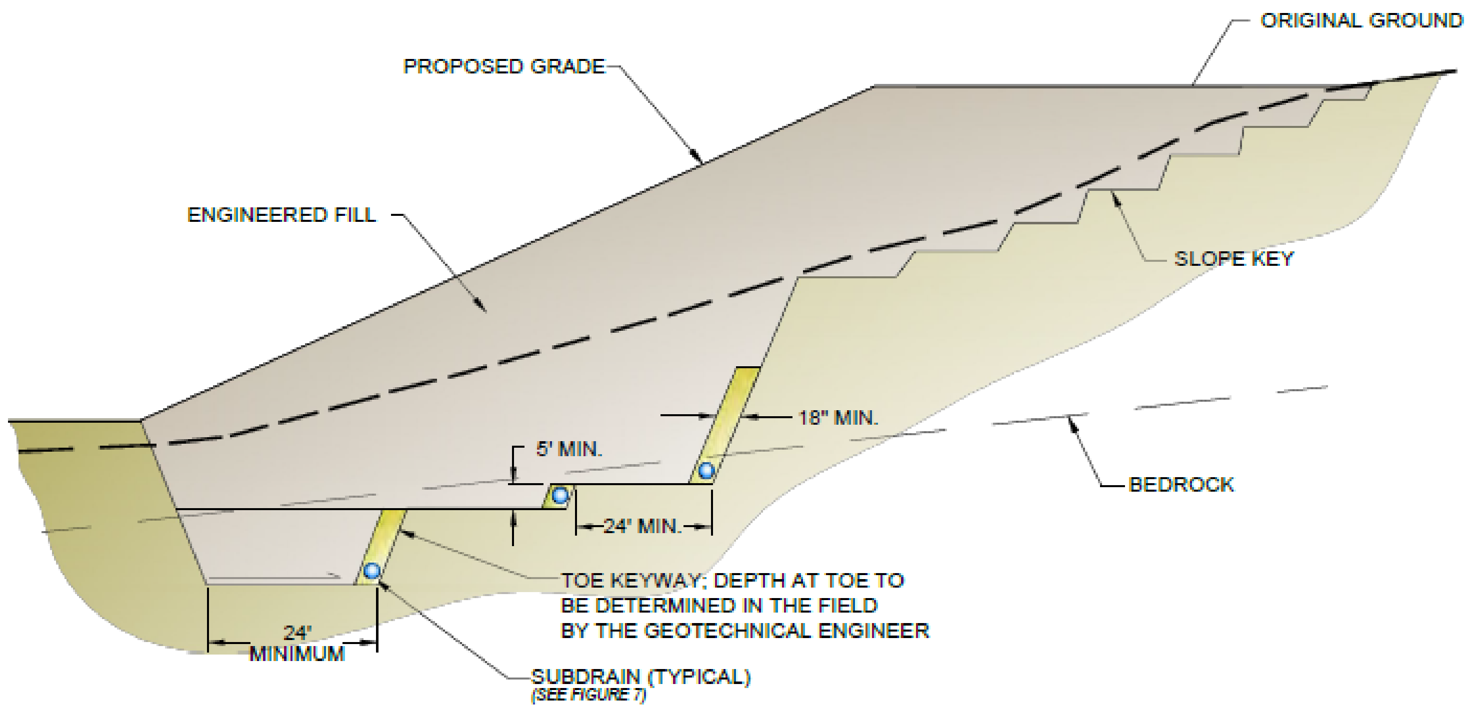
CROSS SECTION A-A' AND B-B'
SCOTTS VALLEY DEVELOPMENT
VALLEJO, CALIFORNIA

PROJECT NO.: 18484.000.001
SCALE: AS SHOWN
DRAWN BY: LL CHECKED BY: JJB
FIGURE NO. 5



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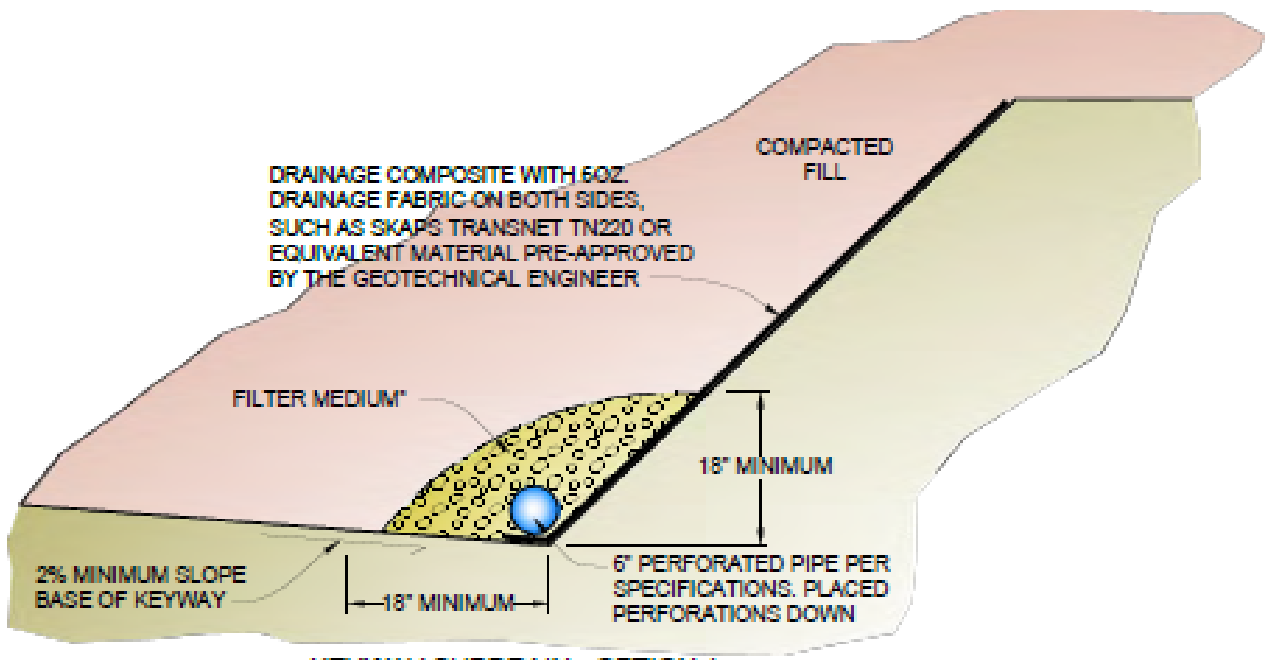
TYPICAL KEYWAY DETAIL

SCOTTS VALLEY DEVELOPMENT
VALLEJO, CALIFORNIA

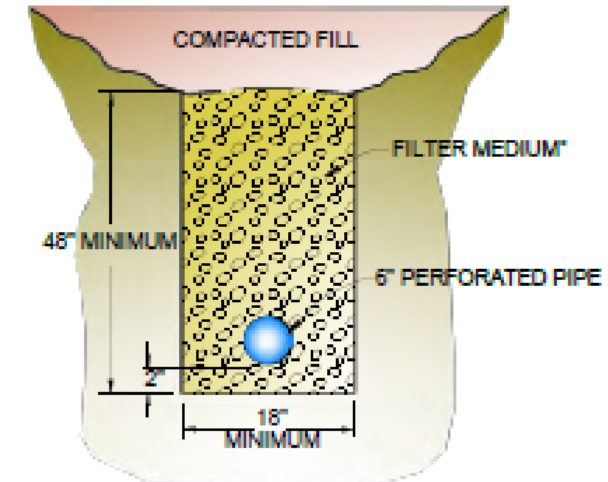
PROJECT NO.: 16484.000.001	
SCALE: AS SHOWN	
DRAWN BY: LL	CHECKED BY: JBR

FIGURE NO. 6

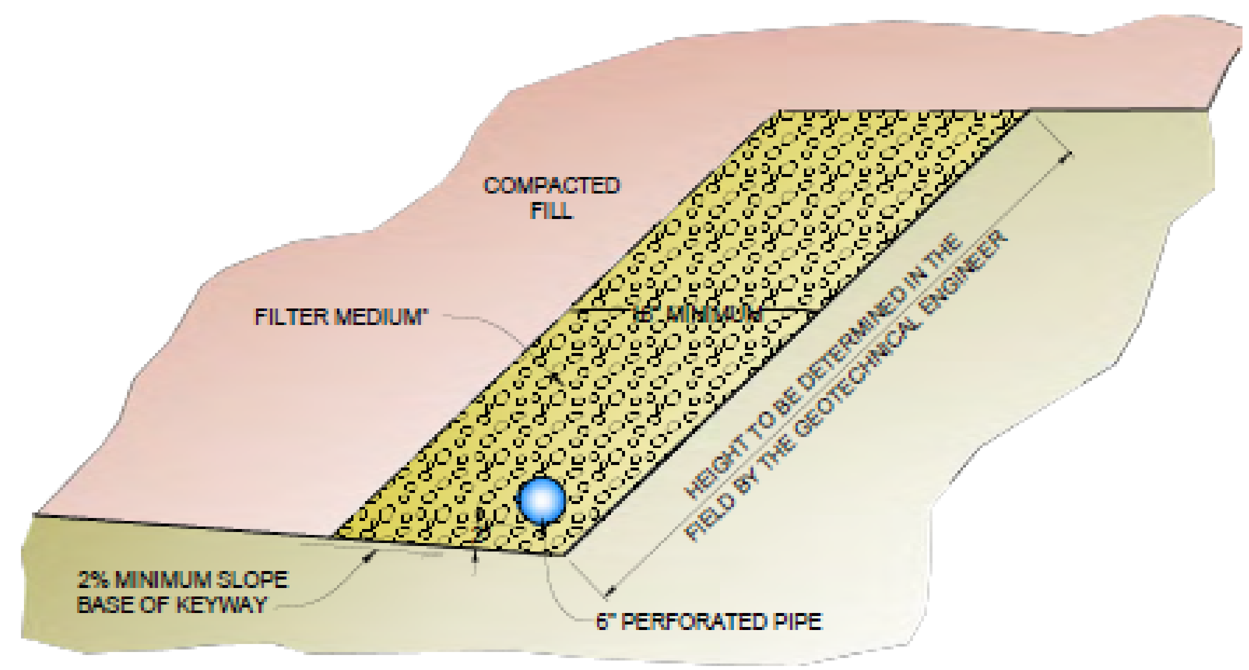
ORIGINAL FIGURE PRINTED IN COLOR



KEYWAY SUBDRAIN - OPTION 1



SWALE SUBDRAIN



KEYWAY SUBDRAIN - OPTION 2

*FILTER MEDIUM

ALTERNATIVE A

CLASS 2 PERMEABLE MATERIAL

MATERIAL SHALL CONSIST OF CLEAN, COARSE SAND AND GRAVEL OR CRUSHED STONE, CONFORMING TO THE FOLLOWING GRADING REQUIREMENTS:

SIEVE SIZE	% PASSING SIEVE
1"	100
3/4"	90-100
3/8"	40-100
#4	25-40
#8	18-33
#30	5-15
#50	0-7
#200	0-3

ALTERNATIVE B

CLEAN CRUSHED ROCK OR GRAVEL WRAPPED IN FILTER FABRIC

ALL FILTER FABRIC SHALL MEET THE FOLLOWING MINIMUM AVERAGE ROLL VALUES UNLESS OTHERWISE SPECIFIED BY ENGEO:

GRAB STRENGTH (ASTM D-4632)	180 lbs
MASS PER UNIT AREA (ASTM D-4751)	6 oz/yd ^{2}
APPARENT OPENING SIZE (ASTM D-4751)	70-100 U.S. STD. SIEVE
FLOW RATE (ASTM D-4491)	80 gal/min/ft
PUNCTURE STRENGTH (ASTM D-4833)	80 lbs

NOTES:

1. ALL PIPE JOINTS SHALL BE GLUED
2. ALL PERFORATED PIPE PLACED PERFORATIONS DOWN
3. 1% FALL (MINIMUM) ON ALL TRENCHES AND DRAIN LINES

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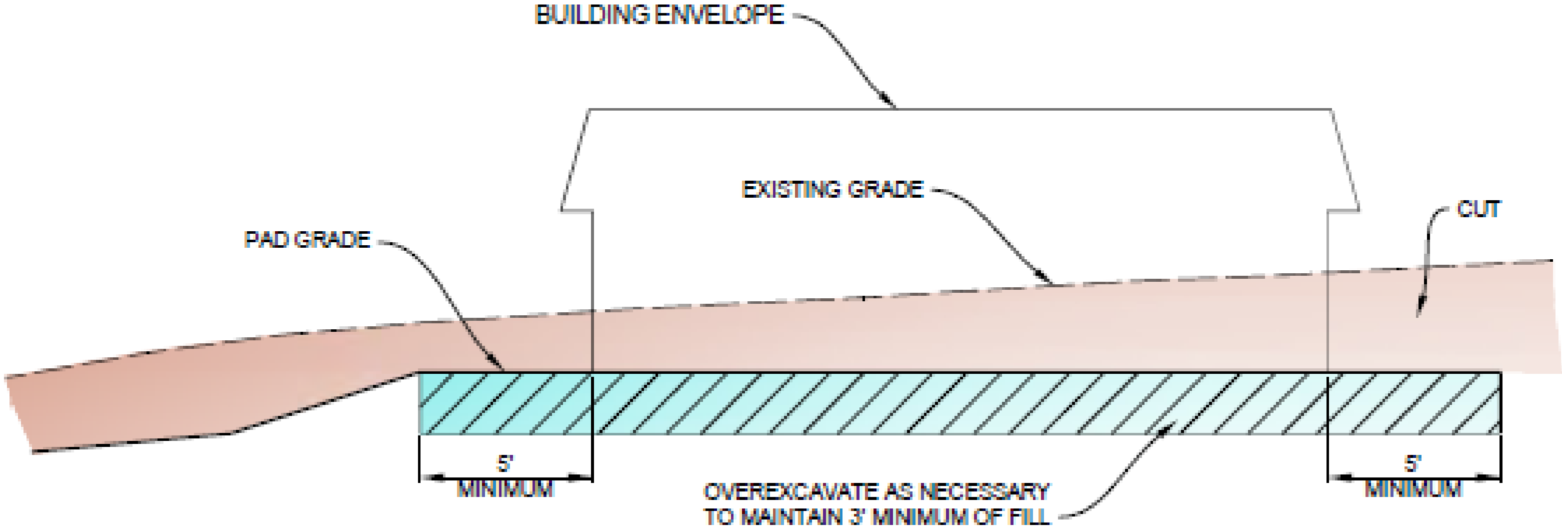
TYPICAL SUBDRAIN DETAILS
SCOTTS VALLEY DEVELOPMENT
VALLEJO, CALIFORNIA

PROJECT NO.: 16484.000.001
SCALE: AS SHOWN
DRAWN BY: LL
CHECKED BY: JBR
FIGURE NO. 7

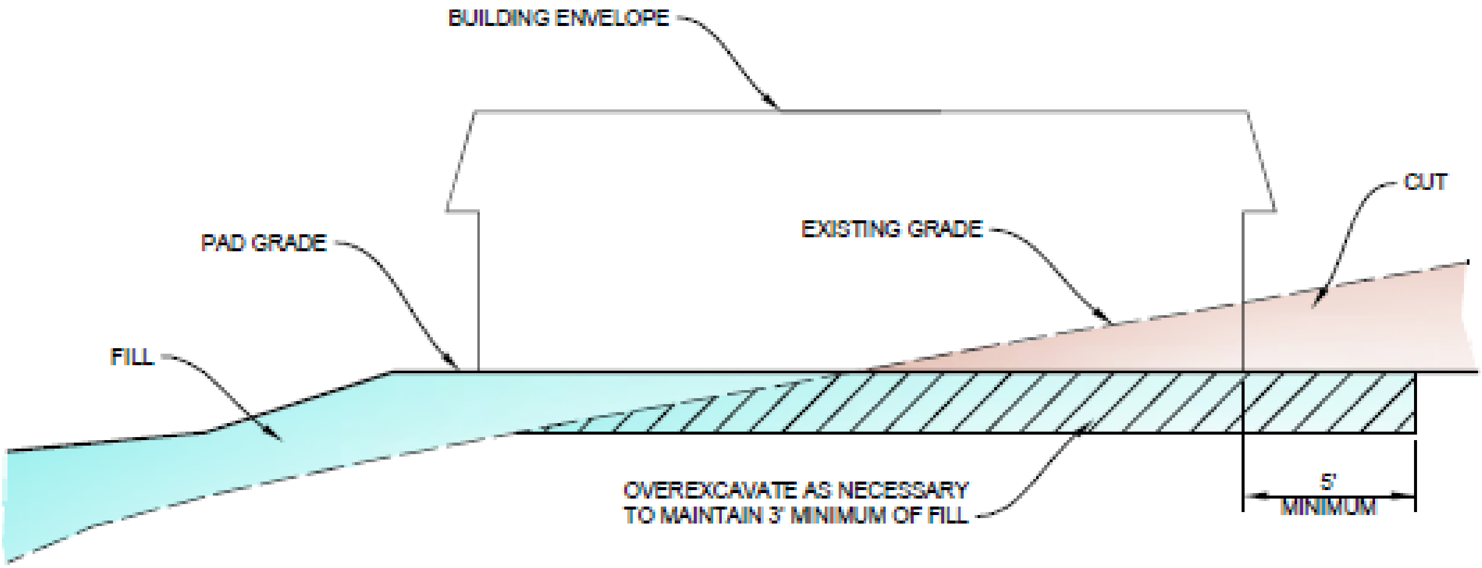
ORIGINAL FIGURE PRINTED IN COLOR



WHERE LOTS ARE COMPLETELY IN CUT, THE UPPER 3' SHOULD BE EXCAVATED AND RECOMPACTED AS SHOWN

ENGEO Expect Excellence	TYPICAL CUT LOT DETAIL SCOTTS VALLEY DEVELOPMENT VALLEJO, CALIFORNIA	PROJECT NO.: 16484.000.001 SCALE: NO SCALE DRAWN BY: LL CHECKED BY: JBR	FIGURE NO. 8

ORIGINAL FIGURE PRINTED IN COLOR



WHERE LOTS ARE PARTIALLY IN FILL, AND PARTIALLY IN CUT, OR LESS THAN 3' OF FILL IS PLANNED TO ACHIEVE PAD GRADE, OVEREXCAVATE AS SHOWN

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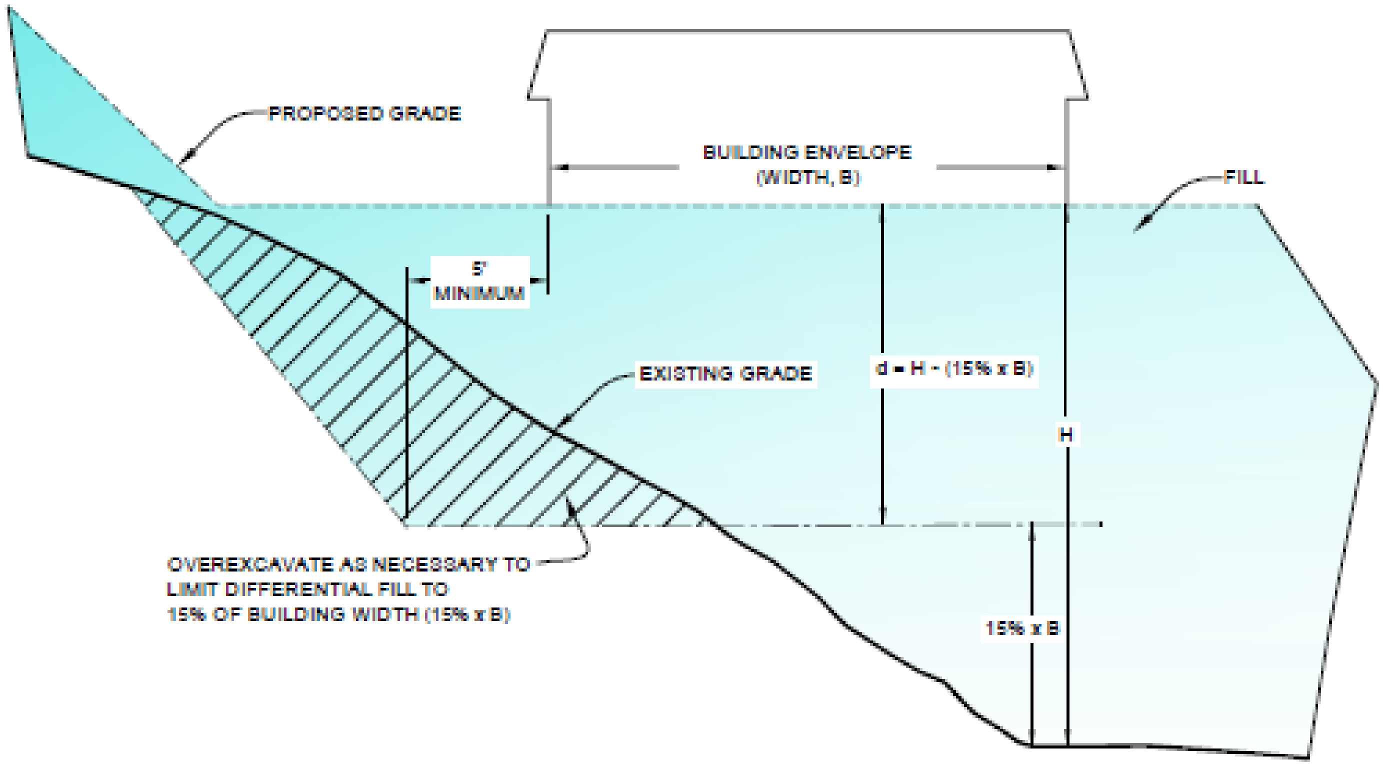
TYPICAL CUT/FILL TRANSITION LOT DETAIL
SCOTTS VALLEY DEVELOPMENT
VALLEJO, CALIFORNIA

PROJECT NO.: 16484.000.001	FIGURE NO. 9
SCALE: AS SHOWN	
DRAWN BY: LL	CHECKED BY: JBR

ORIGINAL FIGURE PRINTED IN COLOR



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TYPICAL FILL LOT DETAIL
SCOTTS VALLEY DEVELOPMENT
VALLEJO, CALIFORNIA

PROJECT NO.: 16484.000.001		FIGURE NO.
SCALE: AS SHOWN		10
DRAWN BY: LL	CHECKED BY: JBR	

ORIGINAL FIGURE PRINTED IN COLOR

APPENDIX A

TEST PIT LOGS
KEY TO BORING LOGS
KEY TO ROCK CHARACTERISTICS
EXPLORATION LOGS

TEST PIT LOG 1-TP1

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.138281 Logged Date: 4/19/24 Long: -122.215997 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 3	FAT CLAY with GRAVEL (CH), black to very dark brown, moist, stiff to very stiff, medium plasticity, fine to coarse angular to sub-angular gravel PP: 2.0 – 3.5 [Qc] Test pit terminated at approximately 3 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP2

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.138281 Logged Date: 4/19/24 Long: -122.216414 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 1	SANDY LEAN CLAY (CL), brown, moist, soft, contains extensive roots PP: 2.0 – 3.5 [Qc]
1 – 3	GRAVELLY FAT CLAY (CH), yellowish brown to brown, moist, stiff to very stiff, medium to high plasticity, fine sub-rounded gravel PP: 2.0 – 2.5 [Qc] Test pit terminated at approximately 3 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP3

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.139316 Logged Date: 4/19/24 Long: -122.217188 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 3	GRAVELLY FAT CLAY (CH), yellowish brown to brown, moist, stiff to very stiff, medium to high plasticity, fine sub-rounded gravel PP: 2.0 – 2.5 [Qc] Test pit terminated at approximately 3 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP4

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.139866 Logged Date: 4/19/24 Long: -122.217523 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 3	SHALE, black to very dark gray, very weak to weak, moderately weathered, thinly bedded, closely spaced joints. Bedding: S50°E at 60° Joint: S05°E at 79° [Kgv] Test pit terminated at approximately 3 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP5

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.140202 Logged Date: 4/19/24 Long: -122.216478 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 3	SHALE, black to very dark gray, very weak to weak, moderately weathered, thinly bedded, closely spaced joints. [Kgv] Test pit terminated at approximately 3 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP6

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.140760 Logged Date: 4/19/24 Long: -122.215953 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 2 ½	FAT CLAY (CH), brown, moist, medium stiff, high plasticity, contains roots PP: 0.75 – 1.0 [Qc]
2 ½ - 4 ½	GRAVELLY FAT CLAY (CH), yellowish brown to brown, moist, stiff to very stiff, medium to high plasticity, fine sub-rounded gravel [Qc]
4 ½ - 5	SILTSTONE, black to very dark gray, very weak to weak, moderately weathered, thinly bedded [Kgv]
	Test pit terminated at approximately 5 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP7

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.140995 Logged Date: 4/19/24 Long: -122.215234 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 6	GRAVELLY FAT CLAY (CH), black with brown, moist, medium stiff, high plasticity, slickened surfaces, fine to coarse angular gravel PP: 2.0 [Qal]
6 – 8	GRAVELLY LEAN CLAY (CL), dark grayish brown, moist, low to medium plasticity, slickened surfaces, blocky, fine rounded gravel [Qc]
	Test pit terminated at approximately 8 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP8

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.141004 Logged Date: 4/19/24 Long: -122.214486 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 3	SANDY LEAN CLAY (CL), brown to reddish brown, moist, very stiff, low to medium plasticity, fine-grained sand PP: 3.5 [Qal]
6 – 8	SILTSTONE, olive gray, medium strong, slightly weathered, thinly bedded, FeO staining on discontinuities. Bedding: N24°W at 32° [Kgv]
	Test pit terminated at approximately 8 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP9

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.141792 Logged Date: 4/19/24 Long: -122.215428 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 6	GRAVELLY LEAN CLAY (CL), dark grayish brown, moist, medium stiff to stiff, low plasticity, slickened surfaces, blocky, fine rounded gravel PP: 1.0 – 1.5 [Qc]
5 – 6	Very stiff to hard
	Test pit terminated at approximately 6 feet below ground surface. Groundwater not encountered.

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TEST PIT LOG 1-TP10

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.143073 Logged Date: 4/19/24 Long: -122.215201 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 3	FAT CLAY (CH), black, moist, very soft to soft, blocky, trace gravel PP: 0.0 – 0.5 [Qal]
3 – 5	GRAVELLY LEAN CLAY with SAND (CL), light gray mottled with orange, saturated, low to medium plasticity, somewhat cemented, coarse angular gravel, gravel is mostly silicious carbonate, contains boulder size gravel [Qc - Debris fan] Test pit terminated at approximately 5 feet below ground surface. Groundwater encountered at 5 feet bgs.

ENGEO — Expect Excellence	TEST PIT LOG 1-TP11	
Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Logged Date: 4/19/24 Equipment: Track-Mounted Excavator - Bobcat 325	Lat: 38.143270 Long: -122.215688

Depth (Feet)	Description
0 – 3	GRAVELLY FAT CLAY (CH), black, moist, medium stiff to stiff, medium to high plasticity, contains sub-angular pebbles and cobbles, gravel is Kgv PP: 1.0 – 1.5 [Qc]
4 – 5	GRAVELLY LEAN CLAY with SAND (CL), light gray mottled with orange, moist, low to medium plasticity, somewhat cemented, coarse angular gravel, gravel is mostly silicious carbonate, contains boulder size gravel [Qc – Debris fan] Test pit terminated at approximately 5 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP12

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.143774 Logged Date: 4/19/24 Long: -122.214834 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 1	SILTY GRAVEL with SAND (GM), dark brownish red, loose, coarse angular gravel [Fill]
1 – 3	GRAVELLY LEAN CLAY (CL), brown, moist, hard, fine rounded gravel [Qc]
	Test pit terminated at approximately 3 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP13

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.143677 Logged Date: 4/19/24 Long: -122.213667 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 2½	SANDY LEAN CLAY (CL), brown, moist, stiff to very stiff, low plasticity, contains silt, fine-grained sand, trace fine gravel PP: 2.0 – 3.0 [Qc]
2½ – 5½	CLAYEY GRAVEL, olive gray and yellowish brown, dense, moist, fine to coarse angular gravel to cobbles, crushed siltstone with clay infill, FeO staining on clasts [Qls - Bedrock Landslide] Test pit terminated at approximately 5½ feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP14

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.145068 Logged Date: 4/19/24 Long: -122.214822 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – ½	GRAVELLY FAT CLAY (CH), dark brown, moist, high plasticity, fine to coarse angular to sub-rounded gravel, organics [Fill]
½ – 3	Dark yellowish brown to olive gray, very soft to soft, reduced organics PP: 0.25
3 – 4	Medium stiff PP: 1.0
4 – 6	GRAVELLY LEAN CLAY (CL), light gray to olive gray, moist, very stiff, low to medium plasticity, angular gravel PP: 2.5 [Qc]
6 – 7	Abundant calcium carbonate cementation, very stiff to hard Test pit terminated at approximately 7 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP15

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.145528 Logged Date: 4/19/24 Long: -122.214206 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 3	FAT CLAY (CH), black to very dark gray, moist, soft to medium stiff, medium plasticity, blocky PP: 0.5 [Qc]
3 – 5	Stiff, trace fine calcium carbonate nodules PP: 2.0
5 – 6	Very dark brown, very stiff to hard, coarse calcium carbonate nodules Test pit terminated at approximately 6 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP16

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by Lat: 38.14446 Logged Date: 4/19/24 Long: -122.214513 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 1	GRAVELLY LEAN CLAY with SAND (CL), reddish brown, dry, soft to medium stiff [Fill]
1 – 2 ½	LEAN CLAY with GRAVEL (CL), dark yellowish brown, moist, very stiff, low to medium plasticity, fine rounded gravel, fine calcium carbonate nodules PP: 4.0 [Qc]
2 ½ - 4	SILICA-CARBONATE ROCK [SOAPSTONE], greenish gray with yellowish red weathering, very weak, moderately weathered, massive [SC]
3 ½ - 4	Strong to very strong Test pit terminated at approximately 4 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP17

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.145737 Logged Date: 4/19/24 Long: -122.214910 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 4	SANDY LEAN CLAY (CL), very dark brown, moist, very stiff, low plasticity, abundant calcium carbonate nodules, fine-grained sand, trace coarse angular gravel PP: 3.0 [Qal]
4 – 5	SILTSTONE, dark yellowish brown and olive gray with bluish gray oxidation on weathered surfaces, strong, slightly weathered, thinly bedded with sandstone Bedding: S58°E at 41° [Kgv]
	Test pit terminated at approximately 5 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP18

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.146285 Logged Date: 4/19/24 Long: -122.214224 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 2	FAT CLAY with GRAVEL (CH), black, moist, stiff, medium to high plasticity, coarse angular gravel, some pebble size clasts PP: 1.5 [Qal]
2 – 3 ½	FAT CLAY (CH), light gray, moist, medium stiff, high plasticity, abundant calcium carbonate PP: 0.75 [Qal]
3 ½ - 5	SHALE, very dark gray to black, very weak to weak, differentially weathered, thinly to very thinly bedded, very thin calcium carbonate layer within bedding Bedding: N°19E at 06° [Altered Kgv]
	Test pit terminated at approximately 5 feet below ground surface. Groundwater not encountered.

ENGEO Expect Excellence	TEST PIT LOG 1-TP19
Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.147471 Logged Date: 4/19/24 Long: -122.212938 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 5	LEAN CLAY (CL), dark yellowish brown, moist, stiff, low to medium plasticity, trace fine rounded to sub-angular gravel PP: 1.5 [Qc]
5 – 6 ½	Blocky structure Test pit terminated at approximately 6 ½ feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP20

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.148596 Logged Date: 4/19/24 Long: -122.212783 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 3	SANDY LEAN CLAY (CL), very dark brown, moist, soft to medium stiff, low plasticity, fine-grained sand, trace fine sub-angular gravel PP: 0.5 [Qc]
3 – 5	LEAN CLAY WITH GRAVEL (CL), dark yellowish brown to dark brown, moist, very stiff, low plasticity, fine to coarse rounded to subrounded gravel PP: 2.25 [Qc]
5 - 6	Blocky structure Test pit terminated at approximately 6 feet below ground surface. Groundwater not encountered.

ENGEO Expect Excellence	# TEST PIT LOG 1-TP21
Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.148746 Logged Date: 4/19/24 Long: -122.213873 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 6	LEAN CLAY (CL), brown to dark yellowish brown, moist, stiff, medium plasticity, somewhat blocky, trace fine sub-angular gravel PP: 1.5 [Qc]
6 – 8	Very stiff to hard, blocky
	Test pit terminated at approximately 8 feet below ground surface. Groundwater not encountered.

ENGEO Expect Excellence	TEST PIT LOG 1-TP22
Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.148363 Logged Date: 4/19/24 Long: -122.214831 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 1 ½	LEAN CLAY (CL), dark brown, moist, medium stiff to stiff, low plasticity, trace sand and gravel, contains roots PP: 1.0 – 1.5 [Qls]
1 ½ – 4	GRAVELLY LEAN CLAY (CL), dark yellowish brown, moist, medium stiff, medium plasticity, fine to coarse angular siltstone gravel PP: 0.75 [Qls]
4 – 6	SHALE, olive gray, medium strong, moderately weathered, thinly bedded, shattered/crushed, heavily jointed Jointing: N41°E at 78° [Kgv-Qls] Test pit terminated at approximately 6 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP23

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.149246 Logged Date: 4/19/24 Long: -122.214299 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 2	SANDY LEAN CLAY (CL), brown, moist, medium stiff, low plasticity, fine-grained sand, trace fine sub-angular gravel PP: 1.0 [Qls]
2 – 3 ½	GRAVELLY LEAN CLAY (CL), dark yellowish brown, moist, stiff, low to medium plasticity, coarse angular gravel [Qls]
3 ½ - 5	SILSTONE, brown with dark orange, extremely weak/residual soil, heavily weathered, abundant slickensides Slickenside Plane: S23°E at 30-40° [Kgv - Qls] Test pit terminated at approximately 5 feet below ground surface. Groundwater not encountered.

TEST PIT LOG 1-TP24

Scott's Valley Development Vallejo, CA 16484.000.001	Logged By: NI, Checked by JBR Lat: 38.149714 Logged Date: 4/19/24 Long: -122.213483 Equipment: Track-Mounted Excavator - Bobcat 325

Depth (Feet)	Description
0 – 2	SANDY LEAN CLAY (CL), brown, moist, medium stiff, low to medium plasticity, fine-grained sand, trace fine sub-angular gravel PP: 1.0 [Qc]
2 – 3 ½	GRAVELLY FAT CLAY (CH), light grayish brown, moist, stiff, medium to high plasticity, fine to coarse angular gravel, some pebble size clasts PP: 1.5 [Qc]
3 ½ - 5	GRAVELLY LEAN CLAY (CL), dark yellowish brown, moist, hard, fine rounded gravel [Qc]
	Test pit terminated at approximately 5 feet below ground surface. Groundwater not encountered.

KEY TO BORING LO S

JOR TYPES			DESCRIPTION
COARSE-GRAINED SOILS MORE THAN HALF OF MAT'L LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LESS THAN 5% FINES	GW - Well graded grav ls or grav el-sand mixt s GP - Poorly g aded grav ls or grav el-sand mixt s
		GRAVELS WITH OVER 12 % FINES	GM - Silty gravels, gravel-sand and silt ixt s GC - Clay y grav ls, grav el-sand and clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 5% FINES	SW - Well graded sands, or gravelly sand mixt s SP - Poorly graded sands or gravelly sand mixt s
		SANDS WITH OVER 12 % FINES	SM - Silty sand, sand-silt mixtures SC - Clayey sand, sand-clay ixt s
FINE-GRAINED SOILS MORE THAN HALF OF MAT'L SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50 % OR LESS		ML - Inorganic silt with low to medium plasticity CL - Inorganic clay with low to medium plasticity OL - Low plasticity organic silts and clays
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50 %		MH - Elastic silt with high plasticity CH - Fat clay with high plasticity OH - Highly plastic organic silts and clays
	HIGHLY ORGANIC SOILS		PT - Peat and other highly organic soils

For fine-grained soils with 15 to 29% retained on the #200 sieve, the words "with sand" or "with gravel" (whichever is predominant) are added to th group name .

For fine-grained soil with >30% retained on the #200 siev , th words "sandy" or "gravelly" (whichever is predominant) are added to th group name .

R IN SIZES

U.S. STANDARD SERIES SIEVE SIZE — 200, 40, 10, 4

CLEAR SQUARE SIEVE OPENIN S — 3/4 ", 3", 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FOOT (S.P.T.)
VERY LOOSE	0-4
LOOSE	4-10
MEDIUM DENSE	10-30
DENSE	30-50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH*
VERY SOFT	0-1/4
SOFT	1/4-1/2
MEDIUM STIFF	1/2-1
STIFF	1-
VERY STIFF	-4
HARD	OVER 4

MOISTURE CONDITION

DRY	Dusty, dry to touch
MOIST	Damp but no visible water
WET	Visible freewater

SAMPLER SYMBOLS

- Modified California (3" O.D.) sampler
- California (2.5" O.D.) sampler
- S.P.T. - Split spoon sampler
- Shelby Tube
- Dames and Moor Piston
- Continuous Core
- Bag Samples
- Grab Samples
- NR No Recovery

LINE TYPES

Solid - Lay Break

Dashed - Gradational or approximate lay break

GROUNDWATER SYMBOLS

Groundwater level during drilling

Stabilized groundwater level

(S.P.T.) Number of blows of 140 lb. hammer falling 30" to drive a 2-inch O.D. (1-3/8 inch I.D.) sampler

* Unconfined compressive strength in tons/sq. ft., asterisk on log means determined by pocket pen trometer

KEY TO ROCK CHARACTERISTICS

ROCK COMPETENCY

Strength	Grade	Hand Sample Characteristic	Approximate Uniaxial Compressive Strength MPa	Approximate Uniaxial Compressive Strength ksi
Extremely Weak	R0	Can be indented by thumb nail	0.25-1.0	< 0.2
Very Weak	R1	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	1 - 5	0.2 - 0.7
Weak	R2	Can be peeled by pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	5 - 25	0.7 - 4
Medium Strong	R3	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	25 - 50	4 - 7
Strong	R4	Specimen requires more than one blow of a geological hammer to fracture	50 - 100	7 - 15
Very Strong	R5	Specimen requires many blows with a geologic hammer to fracture it	100-250	15 - 36
Extremely Strong	R6	Specimen can only be chipped with geological hammer	>250	>36

International Society for Rock Mechanics

ROCK STRUCTURAL FEATURES

Bedding or Foliation		Joints, Fractures, Faults	
Description	Thickness of beds	Description	Spacing
Massive	No apparent bedding	Very widely	> 4 feet
Very thick bedding	Greater than 4 feet	Widely	1 to 4 feet
Thick bedding	2 feet to 4 feet	Moderately	6 to 12 inches
Thin bedding	2 inches to 2 feet	Closely	1 to 6 inches
Very thin bedding	½ inch to 2 inches	Very closely	½ inch to 1 inch
Laminated	Less than ½ inch	Crushed	Less than ½ inch

ROCK WEATHERING

Weathering	Grade	Description
Fresh	F	No visible sign of decomposition or discoloration. Rings under hammer impact.
Slightly	WS	Slight discoloration inwards from open fractures, otherwise similar to Fresh.
Moderately	WM	Discolored throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock, but cores cannot be broken by hand or scraped by knife. Texture preserved.
Highly	WH	Most minerals to some extent decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct but fabric preserved.
Completely Weathered	WC	Minerals decomposed to a soil but the fabric and structure preserved. Specimens easily crumbled or penetrated.
Residual Soil	RS	Advanced state of decomposition resulting in plastic soils. Rock fabric and structure completely destroyed. Large volume change.

International Society for Rock Mechanics

ROCK QUALITY DESIGNATION (RQD)

*RQD %	Rock Quality
90-100	Excellent
75-90	Good
50-75	Fair
25-50	Poor
0-25	Very Poor

*RQD = The total length of pieces of rock core with length greater than 4 inches, divided by the full length of the core run

DISCONTINUITY SHORTHAND

Discontinuity Data	Abbreviation
Type	
Bedding	Be
Joint	Jo
Shear	Sh
Mechanical Break	Me
Vein	Ve
Fault	Flt
Void	Vd
Fracture Zone	FZ
Aperture	
Tight	Ti
Open	Op
Healed	He
Filled	Fi
Surface Shape	
Irregular	Ir
Planar	Pl
Undulating, Curved	U
Stepped	S
Roughness	
Stepped	St
Rough	Ro
Moderately Rough	MR
Smooth	Sm
Slickensided	K
Polished	P
Infill Type	
Clean	N
Surface Film	F
Cemented	C
Infilling Material	
Carbonate	Ca
Iron Oxide	Fe
Magnesium Oxide	Mn
Quartz	Q
Clay	Cl

ENGEO
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LOG OF BORING 1-B1

LATITUDE: 38.14354 LONGITUDE: -122.21349

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/23/2024
HOLE DEPTH: Approx. 75½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD88): Approx. 279 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: SFA, Switch to Mud
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
			LEAN CLAY (CL), dark brown, medium stiff to stiff, moist, rootlets [Qc, COLLUVIUM]												
						13								1*	PP
			Brown mottled with dark brown				65	16	49						
	275					16					22	106	1422	1.4	UC
5			MUDSTONE, yellowish brown, very weak (R1), completely weathered (WC) [Qls, LANDSLIDE DEBRIS]			45									
			Switched to coring at approximately 6½ feet below ground surface. See next page for coring log.												
	270														
10															
	265														
15															
	260														
20															

CORELOG 1-B1

ENGEO
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LATITUDE: 38.14354 LONGITUDE: -122.21349

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/23/2024
HOLE DEPTH: Approx. 75½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD88): Approx. 279 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
CORING CONTRACTOR: Britton Exploration
CORING METHOD, BIT SIZE/TYPE: Wireline Core
NO. OF CORE BOXES: 7

Depth in Feet	Elevation in Feet	Sample Type	Run Number	Drill Rate (s/ft)	Run Length (ft) / Recovery (ft)	RQD	Relative Hardness / Weathering Grade	Graphic Log	Discontinuties Remarks	DESCRIPTION	NOTES
	278										
	277										
	276										
	275										
5	274										
	273									Begin wireline coring at 6.5 feet below ground surface. See soil borelog for previous data.	
	272		1	1.2	0/1.5	0	R0 / WC	NR		SHEARED MUDSTONE, yellowish brown, extremely weak (R0), moderately fractured, completely weathered (WC), mudstone clasts within sheared clay matrix [Qls, LANDSLIDE DEBRIS]	
	271										
	270										
10	269		2	1.2	4.2/5	0	R0 / WC		- Sh: 30° Ti, Ir, MR, F, Cl	Clay matrix washed out	
	268										
	267							NR	- Me	11'-12': matrix partially washed out, calcite veins	
	266										
	265										
15	264		3	2.6	5/5	0	R0 / WC		- Vd: washed out matrix	Matrix washed out	
	263										
	262								- Sh: 25° Ti, Ir, MR, F, Cl - Me - Me	Closely fractured	
	261						R1 / WC			Very weak (R1), moderately fractured	
	260								- Me - Jo: 10° He, St		
20	259									19.5'-19.7': 2" band of gray rock at 60-70°	

R0 R1 R2 R3 R4 R5 R6
RS WC WH WM WS F

ENGEO
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CORELOG 1-B1

LATITUDE: 38.14354 LONGITUDE: -122.21349

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED:	4/23/2024	LOGGED / REVIEWED BY:	K. Wang / JBR
HOLE DEPTH:	Approx. 75½ ft.	CORING CONTRACTOR:	Britton Exploration
HOLE DIAMETER:	8.0 in.	CORING METHOD, BIT SIZE/TYPE:	Wireline Core
SURF ELEV (NAVD88):	Approx. 279 ft.	NO. OF CORE BOXES:	7

Depth in Feet	Elevation in Feet	Sample Type	Run Number	Drill Rate (s/ft)	Run Length (ft) / Recovery (ft)	RQD
	258–256		4	3	3.8/5	0
25	256–251 (254 at 25 ft)		5	1.2	3.8/5	0
30	251–246 (249 at 30 ft)		6	1.2	3/5	0
35	246–241 (244 at 35 ft)		7	3	5/5	0
40	239					

Relative Hardness: R0, R1, R2, R3, R4, R5, R6

Weathering Grade: RS, WC, WH, WM, WS, F

Graphic Log

Discontinuities Remarks

- Jo: 70-80° He
- Vd: washed out matrix zone 21.25' - 21.75'
- Clay gouge zone 23'-23.5'
- Me
- Me
- Me
- Me
- Me
- Ve: 35° Sh, He, Ca
- Ve: 35° Sh, He, Ca
- Vd: washed out matrix
- Matrix partially washed out
- Me
- Sh: 30° Ti, St

DESCRIPTION

SHEARED MUDSTONE, yellowish brown, very weak (R1), moderately fractured [Qls, LANDSLIDE DEBRIS]

Crushed, grades to strong gray, highly to moderately weathered

SHEARED SHALE, strong gray, very weak (R1), moderately fractured to closely fractured, highly weathered (WH) to completely weathered (WC), angular shale clasts in clay matrix [Qls, LANDSLIDE DEBRIS]

Calcite veins

Mottled with dark gray

NOTES

25': DD=131.8 pcf, MC=10.35%, UCS=5.167 tsf

ENGEO
Expect Excellence

CORELOG 1-B1

LATITUDE: 38.14354 LONGITUDE: -122.21349

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/23/2024
HOLE DEPTH: Approx. 75½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD88): Approx. 279 ft.
LOGGED / REVIEWED BY: K. Wang / JBR
CORING CONTRACTOR: Britton Exploration
CORING METHOD, BIT SIZE/TYPE: Wireline Core
NO. OF CORE BOXES: 7

Depth in Feet | Elevation in Feet | Sample Type | Run Number | Drill Rate (s/ft) | Run Length (ft) / Recovery (ft) | RQD | Relative Hardness (R0, R1, R2, R3, R4, R5, R6) | Weathering Grade (RS, WC, WH, WM, WS, F) | Graphic Log | Discontinuties Remarks | DESCRIPTION | NOTES

Run Number	Drill Rate (s/ft)	Run Length (ft) / Recovery (ft)	RQD
8	3	4.3/5	0
9	5.2	5/5	0
10	4.8	5/5	0
11	2.8	4.8/5	0

Discontinuties Remarks:
- Jo: 10° Ti, Ir, MR, F, Cl
- Jo: 25° Ti, Ir, MR, F, Cl
- Me
- Me
- Vd: washed out matrix
- Me
- Vd: washed out matrix
- Sh: 15° Ti, Ir, MR, F, Cl
- Me
- Jo: 10° Ti, Ir, Ro, F, Cl
- Sh: 15° Ti, Ir, MR, F, Cl
- Me
- Sh: 15° Ti, Ir, MR, F, Cl
- Me
- Jo: 20° He, Ir, Ro,
- Me
- Me
- Me
- FZ: 58'-59.5'
- Sh: 15° Ti, Ir, P, N

DESCRIPTION:

SHEARED SHALE, strong gray, very weak (R1), very closely fractured to crushed, highly weathered (WH) to completely weathered (WC), angular shale clasts in clay matrix [Qls, LANDSLIDE DEBRIS]

Matrix washed out

Becomes clast-supported, reduced clay matrix

Depth: 45, 50, 55, 60
Elevation: 238, 237, 236, 235, 234, 233, 232, 231, 230, 229, 228, 227, 226, 225, 224, 223, 222, 221, 220, 219

NR

ENGEO
Expect Excellence

CORELOG 1-B1

LATITUDE: 38.14354 LONGITUDE: -122.21349

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/23/2024
HOLE DEPTH: Approx. 75½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD88): Approx. 279 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
CORING CONTRACTOR: Britton Exploration
CORING METHOD, BIT SIZE/TYPE: Wireline Core
NO. OF CORE BOXES: 7

Depth in Feet	Elevation in Feet	Sample Type	Run Number	Drill Rate (s/ft)	Run Length (ft) / Recovery (ft)	RQD	Relative Hardness (R0 R1 R2 R3 R4 R5 R6) / Weathering Grade (RS WC WH WM WS F)	Graphic Log	Discontinuties Remarks	DESCRIPTION	NOTES
	218, 217, 216		12	2.6	5/5	0			- FZ: 60'-61.5' Material degraded to clay - Ve: 15° Sh, He, Ca	SHEARED SHALE, strong gray mottled with dark gray, very weak (R1), very closely fractured to crushed, highly weathered (WH), angular shale clasts in minor clay matrix [Qls, LANDSLIDE DEBRIS]	
65	215, 214, 213, 212, 211		13	7.6	4.4/5	6.7		NR	- FZ: 63'-63.5', Be: 30-35° - Sh: 25° Ti, Pl, P, N - Sh: 25° Ti, Pl, P, F, Cl - FZ: 65'-66', Be: 25-35° - Sh: 30° Ti, Pl, P, F, Cl - Sh: 30° Ti, Pl, P, F, Cl	63.8'-64.6': intensely sheared and fractured, joints and shears are healed, shears along bedding Very closely fractured to crushed, moderately weathered (WM), very thinly bedded, reduced shearing Closely fractured, freshly weathered (F) 66.3'-66.9': clay gouge 66.9'-67.4': SANDSTONE, gray, moderately strong, moderately to slightly weathered, thinly bedded	
70	210, 209, 208, 207		14	5.6	5/5	0			- Jo: 20° Op, St - Jo: 20° Ti, St - Jo: 20° Ti, St - Jo/Sh: 30° Ti, Pl, P, F, Cl - FZ: 69.5'-71.3', He, F, Cl, randomly oriented - FZ: 72'-73'	Very closely fractured to crushed, moderately weathered (WM) to highly weathered (WH), 68.5'-69.5': clay gouge SHALE, strong gray, very weak (R1), very closely fractured, highly weathered (WH), joints and shears throughout, healed to open, randomly oriented [Qls, LANDSLIDE DEBRIS]	69': PL=17 LL=43 fines=97.2% clay=54.9%
75	206, 205, 204		15	8.4	2.5/2.5	0			- FZ: 73'-74.25', Op - Sh/Shear Zone: 45° Op, Pl	Crushed, Angular shale fragments with no matrix Closely fractured, 74.3'-75': Healed joints and shears	
										Bottom of boring at approximately 75½ feet below ground surface. Groundwater encountered during drilling at approximately 14 feet below ground surface.	

R0 R1 R2 R3 R4 R5 R6
RS WC WH WM WS F

ENGEO
Expect Excellence

LOG OF BORING 1-B2

LATITUDE: 38.14328 LONGITUDE: -122.21502

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/22/2024
HOLE DEPTH: Approx. 43¼ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD88): Approx. 231 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
			FAT CLAY (CH), black, soft to medium stiff, moist, trace angular coarse gravel [Qal, ALLUVIUM]												
	230					9	92	21	71		36	79	592.8	0.6	UC
						12							100*	0.75*	PP+TV
5			SANDY LEAN CLAY (CL), yellowish brown mottled with very light brown, medium stiff to very stiff, moist, fine-grained sand, angular coarse gravel [Qc, COLLUVIUM]			17									
	225										30	92.5	837	0.85	UC
			CLAYEY SAND (SC), dark brown, loose, moist, angular, coarse gravel [Qc, COLLUVIUM]			21				19					
10			Very dense			50									
	220														
			Dark yellowish brown			50									
			SHALE, dark gray to very dark gray, very weak (R1), highly weathered (WH) [Kgv, GREAT VALLEY SEQUENCE]		▽	50/6"									
15															
	215					47									
20															

LOG OF BORING 1-B2

ENGEO
Expect Excellence

LATITUDE: 38.14328 LONGITUDE: -122.21502

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/22/2024
HOLE DEPTH: Approx. 43¼ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD88): Approx. 231 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
	210		SHALE, dark gray to very dark gray, very weak (R1), highly weathered (WH) [Kgv, GREAT VALLEY SEQUENCE]			50/4"									
25	205					41									
30	200					50/4"									
35	195					55									
40															

LOG OF BORING 1-B2

ENGEO
Expect Excellence

LATITUDE: 38.14328 LONGITUDE: -122.21502

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/22/2024
HOLE DEPTH: Approx. 43¼ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD88): Approx. 231 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
	190		SHALE, dark gray to very dark gray, very weak (R1), completely weathered (WC), clay matrix with rock fragments [Kgv, GREAT VALLEY SEQUENCE]			50/3"									
						50/2"									
			Bottom of boring at approximately 43 feet below ground surface. Groundwater encountered during drilling at approximately 14 feet below ground surface.												

LOG OF BORING 1-B3

LATITUDE: 38.14889 LONGITUDE: -122.21444

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/25/2024
HOLE DEPTH: Approx. 60 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (NAVD88): Approx. 497 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
DRILLING CONTRACTOR: Britton Exploration
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (psf) *field approximation	Unconfined Strength (tsf) *field approximation	Strength Test Type
			POORLY GRADED SAND WITH CLAY (SP-SC), dark brown, loose, dry to moist, rootlets [Qc, COLLUVIUM]												
	495														
			CLAYEY SAND (SC), yellowish brown, medium dense, moist [Qc, COLLUVIUM]							25					
5						47					14	105.9			
	490		SANDSTONE, yellowish brown, extremely weak (R0), completely weathered (WC), decomposed [Qls, LANDSLIDE DEBRIS]												
10						43									
	485		Switched to dry coring at approximately 11½ feet below ground surface. See next page for dry coring log.												
15															
	480														
20															

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CORELOG 1-B3

LATITUDE: 38.14889 LONGITUDE: -122.21444

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/25/2024
HOLE DEPTH: Approx. 60 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (NAVD88): Approx. 497 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
CORING CONTRACTOR: Britton Exploration
CORING METHOD, BIT SIZE/TYPE: Dry Core
NO. OF CORE BOXES: 4

Depth in Feet	Elevation in Feet	Sample Type	Run Number	Drill Rate (s/ft)	Run Length (ft) / Recovery (ft)	RQD	Relative Hardness (R0 R1 R2 R3 R4 R5 R6) / Weathering Grade (RS WC WH WM WS F)	Graphic Log	Discontinuties Remarks	DESCRIPTION	NOTES
	496										
	495										
	494										
	493										
5	492										
	491										
	490										
	489										
	488									Begin dry coring at 10 feet below ground surface. See soil borelog for previous data.	
10	487		1	2	4.25/5	0			- Jo: 5° Op, Ir, St - Jo: 10° Op, Ir, St	SANDSTONE, reddish yellow, extremely weak (R0), closely fractured to very closely fractured, completely weathered (WC) to residual soil (RS), landslide debris comprising angular clasts of sheared sandstone within a fine-grained matrix [Qls, LANDSLIDE DEBRIS] 13'-13.25': clay gouge, black oxidation	
15	482		2	2	5/5	0		NR	- Me - Jo: 10° Op, Ir, Ro - FZ/Shear zone: 16.75'-17.25' - Me - Me - Jo: 5° Op, Ir, Ro - Jo: 0° Op, Ir, Ro - FZ: 19.5'-20'		
20	477						R0 R1 R2 R3 R4 R5 R6 / RS WC WH WM WS F				

LOG-CORELOG_MASTER SOIL LOGS.GPJ ENGEO INC.GDT 5/21/24

CORELOG 1-B3

ENGEO Expect Excellence

LATITUDE: 38.14889 LONGITUDE: -122.21444

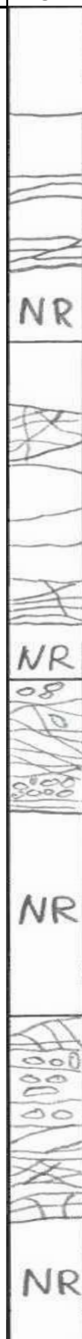
Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED:	4/25/2024	LOGGED / REVIEWED BY:	K. Wang / JBR
HOLE DEPTH:	Approx. 60 ft.	CORING CONTRACTOR:	Britton Exploration
HOLE DIAMETER:	6.0 in.	CORING METHOD, BIT SIZE/TYPE:	Dry Core
SURF ELEV (NAVD88):	Approx. 497 ft.	NO. OF CORE BOXES:	4

Depth in Feet	Elevation in Feet	Sample Type	Run Number	Drill Rate (s/ft)	Run Length (ft) / Recovery (ft)	RQD	Relative Hardness / Weathering Grade
20–25	476–472		3	2.2	3.9/5	0	R0 / WC
25–30	472–467		4	1	4.2/5	0	R0 / WC
30–35	467–462		5	4.4	2/5	0	R0 / WC
35–40	462–457		6	1.8	3/5	0	R0 / WC

Relative Hardness: R0 R1 R2 R3 R4 R5 R6
Weathering Grade: RS WC WH WM WS F

Graphic Log



Discontinuties Remarks

- Jo: 5° Op, Ir, Ro
- Sh: 45° Op, Pl, MR, F, Sand
- FZ: 23.5'-24, 60°&0°
- FZ: 26'-26.5'
- Sh: 30° Op, Ir, MR, F, Cl
- FZ: 27'-30'

DESCRIPTION

SANDSTONE, reddish yellow, extremely weak (R0), crushed, completely weathered (WC) to residual soil (RS), decomposed sandstone clasts without matrix [Qls, LANDSLIDE DEBRIS]
20.8'-21': dark brown, residual soil
Intensely fractured throughout

Completely weathered (WC)

25'-26': zone of reduced fractures and shears

Crushed; decomposed rock fragments up to 2 inches in diameter, no matrix

NOTES

CORELOG 1-B3

LATITUDE: 38.14889 LONGITUDE: -122.21444

Landslide Exploration
Scott's Valley PGEX
Vallejo, CA
16484.000.001

DATE DRILLED: 4/25/2024
HOLE DEPTH: Approx. 60 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (NAVD88): Approx. 497 ft.

LOGGED / REVIEWED BY: K. Wang / JBR
CORING CONTRACTOR: Britton Exploration
CORING METHOD, BIT SIZE/TYPE: Dry Core
NO. OF CORE BOXES: 4

Depth in Feet	Elevation in Feet	Sample Type	Run Number	Drill Rate (s/ft)	Run Length (ft) / Recovery (ft)	RQD	Relative Hardness (R0 R1 R2 R3 R4 R5 R6) / Weathering Grade (RS WC WH WM WS F)	Graphic Log	Discontinuties Remarks	DESCRIPTION	NOTES
	456–452		7	4	1.5/5	0	R0 / WC	NR		SANDSTONE, reddish yellow, extremely weak (R0), crushed, completely weathered (WC), angular sandstone clasts without matrix [Qls, LANDSLIDE DEBRIS]	
45	452–447		8	1.2	2.75/5	0	R0 / WC	NR		Grades to yellowish brown	
50	447–442		9	1.6	2.5/5	0	R0 / WC	NR		SHALE, yellowish brown, extremely weak (R0), crushed, completely weathered (WC), angular shale clasts without matrix [Qls, LANDSLIDE DEBRIS]	
55	442–437		10	1.4	0/5	0	R0 / WC	NR			
60	437									Bottom of boring at approximately 60 feet below ground surface. Groundwater not encountered during drilling.	

APPENDIX B

MPD INFILTROMETER DATA

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Infiltration Report

Engeo San Ramon

651.237.5123

Scott's Valley - 16484.000.001 - Vallejo, CA

This report summarizes the results of a set of Modified Philip Dunne (MPD) Infiltrometer tests performed at the above referenced site. Engeo San Ramon personnel performed the field tests. The software used to compute saturated hydraulic conductivity (K_{sat}) and generate this report assumes that the field personnel used infiltrometers manufactured by Upstream Technologies Inc. and followed the procedures outlined in “Manual – Modified Philip - Dunne Infiltrometer” by Ahmed, Gulliver, and Nieber.

The following paragraphs describe the individual tests, input values used in the analysis, and methods used to compute the K_{sat} value.

After individual K_{sat} values were calculated, the method used to determine the overall site K_{sat}value ($K_{best\text{-}fit}$) is described in "Effective Saturated Hydraulic Conductivity of an Infiltration-Based Stormwater Control Measure" by Weiss and Gulliver 2015, "A relationship to more consistently and accurately predict the best-fit value of saturated hydraulic conductivity used a weighted sum of 0.32 times the arithmetic mean and 0.68 times the geometric mean."

METHOD USED TO COMPUTE K_{sat}

The MPD Infiltrometer software uses the following procedure described in "The Comparison of Infiltration Devices and Modification of the Philip-Dunne Permeameter for the Assessment of Rain Gardens" by Rebecca Nestigen, University of Minnesota, November 2007.

The steps are as follows:

1. For each measurement of head, use the following equation to find the corresponding distance to the sharp wetting front.

$$[H_0 - H(t)]r_1^2 = \frac{\theta_1 - \theta_2}{3}[2[R(t)]^3 + 3[R(t)]^2 L_{max} - L_{max}^3 - 4r_0^3$$

2. Estimate the change in head with respect to time and the change in wetting front distance with respect to time by using the backward difference for all values of R(t) equal to or greater than the distance

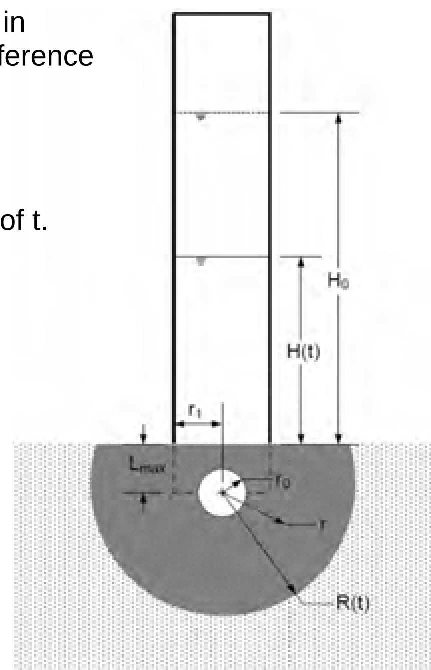
$$\sqrt{r_1^2 + L_{max}^2}$$

3. Make initial guesses for K and C.
4. Solve the following equations for ΔP(t) at each incremental value of t.

$$\Delta P(t) = \frac{\pi^2}{8}\left\{\theta_1 - \theta_0 \frac{[R(t)^2] + [R(t)]L_{max}}{K}\frac{dr}{dt} - 2r_0^2\right\} \frac{ln[\frac{R(t)[r_0 + L_{max}]}{r_0[R(t) + L_{max}]}]}{L_{max}}$$

$$\Delta P(t) = C - H(t) - L_{max} + \frac{L_{max}}{K}\frac{dh}{dt}$$

5. Minimize the absolute difference between the two solutions found in Step 4 by adjusting the values of K and C.



Parameters for Equations

Θ_0 = volumetric water content of soil before MPD test

Θ_1 = volumetric water content of soil after MPD test

Infiltration Report

MPD INFILTROMETER
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Scott's Valley - 16484.000.001 - Vallejo, CA

1mpd4

Date	4/9/2024
Time	8:24 AM
Latitude	38.137993
Longitude	-122.216017
Initial Volumetric Moisture	10.00 %
Final Volumetric Moisture	50.00 %
Cylinder Size	3 Liter

1mpd4 Results

Map Pin #	1
Test Number	27665
Ksat - mm/hr	79
Ksat - in/hr	3.12
Capillary Pressure C mm	-64.6
RMS Error of Regression	8.9
Normalized RMS	0.3%

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	34.54 cm	26	749 s	24.33 cm	51	1500 s	17.38 cm	76	2250 s	12.11 cm
2	30 s	34.04 cm	27	780 s	24.0 cm	52	1530 s	17.14 cm	77	2279 s	11.91 cm
3	59 s	33.53 cm	28	810 s	23.69 cm	53	1560 s	16.91 cm	78	2310 s	11.73 cm
4	90 s	33.05 cm	29	840 s	23.37 cm	54	1590 s	16.67 cm	79	2339 s	11.54 cm
5	120 s	32.56 cm	30	870 s	23.06 cm	55	1620 s	16.45 cm	80	2370 s	11.36 cm
6	150 s	32.11 cm	31	899 s	22.76 cm	56	1650 s	16.22 cm	81	2400 s	11.18 cm
7	180 s	31.64 cm	32	930 s	22.45 cm	57	1679 s	15.99 cm	82	2429 s	11.0 cm
8	210 s	31.19 cm	33	959 s	22.15 cm	58	1710 s	15.77 cm	83	2460 s	10.82 cm
9	239 s	30.74 cm	34	990 s	21.86 cm	59	1739 s	15.55 cm	84	2489 s	10.65 cm
10	270 s	30.31 cm	35	1019 s	21.57 cm	60	1770 s	15.33 cm	85	2520 s	10.47 cm
11	299 s	29.89 cm	36	1050 s	21.29 cm	61	1799 s	15.12 cm	86	2550 s	10.28 cm
12	330 s	29.48 cm	37	1079 s	21.0 cm	62	1830 s	14.91 cm	87	2579 s	10.11 cm
13	359 s	29.06 cm	38	1110 s	20.72 cm	63	1859 s	14.69 cm	88	2610 s	9.94 cm
14	390 s	28.67 cm	39	1139 s	20.43 cm	64	1890 s	14.48 cm	89	2640 s	9.77 cm
15	419 s	28.27 cm	40	1170 s	20.17 cm	65	1919 s	14.27 cm	90	2669 s	9.6 cm
16	450 s	27.89 cm	41	1200 s	19.89 cm	66	1950 s	14.06 cm	91	2700 s	9.42 cm
17	479 s	27.49 cm	42	1230 s	19.62 cm	67	1979 s	13.86 cm	92	2729 s	9.25 cm
18	510 s	27.12 cm	43	1260 s	19.36 cm	68	2010 s	13.66 cm	93	2759 s	9.09 cm
19	539 s	26.75 cm	44	1290 s	19.11 cm	69	2039 s	13.45 cm	94	2790 s	8.92 cm
20	570 s	26.39 cm	45	1320 s	18.85 cm	70	2070 s	13.26 cm	95	2819 s	8.76 cm
21	600 s	26.02 cm	46	1350 s	18.59 cm	71	2100 s	13.05 cm	96	2849 s	8.59 cm
22	629 s	25.68 cm	47	1380 s	18.35 cm	72	2129 s	12.86 cm	97	2880 s	8.43 cm
23	660 s	25.33 cm	48	1410 s	18.1 cm	73	2160 s	12.67 cm	98	2909 s	8.27 cm
24	689 s	24.99 cm	49	1440 s	17.86 cm	74	2189 s	12.48 cm	99	2939 s	8.11 cm
25	720 s	24.66 cm	50	1470 s	17.61 cm	75	2220 s	12.29 cm	100	2970 s	7.96 cm

Infiltration Report

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1mpd4 Readings continued

#	Time	Head
101	2999 s	7.8 cm
102	3029 s	7.65 cm
103	3060 s	7.49 cm
104	3089 s	7.33 cm
105	3120 s	7.2 cm
106	3150 s	7.05 cm
107	3179 s	6.89 cm
108	3210 s	6.75 cm
109	3239 s	6.6 cm
110	3270 s	6.46 cm
111	3300 s	6.31 cm
112	3329 s	6.17 cm
113	3360 s	6.03 cm
114	3389 s	5.9 cm
115	3420 s	5.76 cm
116	3450 s	5.61 cm
117	3479 s	5.47 cm
118	3510 s	5.33 cm

Infiltration Report

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1mpd3

Date	4/9/2024
Time	9:42 AM
Latitude	38.138578
Longitude	-122.215725
Initial Volumetric Moisture	30.00 %
Final Volumetric Moisture	70.00 %
Cylinder Size	3 Liter

1mpd3 Results

Map Pin #	2
Test Number	27669
Ksat - mm/hr	NULL
Ksat - in/hr	NULL
Capillary Pressure C mm	NULL
RMS Error of Regression	NULL
Normalized RMS	NULL

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	36.39 cm	26	748 s	36.53 cm	51	1498 s	36.58 cm	76	2248 s	36.63 cm
2	28 s	36.39 cm	27	778 s	36.53 cm	52	1528 s	36.58 cm	77	2278 s	36.64 cm
3	58 s	36.39 cm	28	808 s	36.54 cm	53	1558 s	36.59 cm	78	2308 s	36.64 cm
4	88 s	36.39 cm	29	838 s	36.54 cm	54	1588 s	36.59 cm	79	2338 s	36.65 cm
5	118 s	36.4 cm	30	868 s	36.55 cm	55	1618 s	36.59 cm	80	2368 s	36.65 cm
6	148 s	36.41 cm	31	898 s	36.55 cm	56	1648 s	36.59 cm	81	2398 s	36.65 cm
7	178 s	36.41 cm	32	928 s	36.55 cm	57	1678 s	36.59 cm	82	2428 s	36.65 cm
8	208 s	36.42 cm	33	958 s	36.55 cm	58	1708 s	36.59 cm	83	2458 s	36.65 cm
9	238 s	36.43 cm	34	988 s	36.55 cm	59	1738 s	36.6 cm	84	2488 s	36.65 cm
10	268 s	36.44 cm	35	1018 s	36.56 cm	60	1768 s	36.6 cm	85	2518 s	36.66 cm
11	298 s	36.44 cm	36	1048 s	36.56 cm	61	1798 s	36.6 cm	86	2548 s	36.66 cm
12	328 s	36.46 cm	37	1078 s	36.56 cm	62	1828 s	36.6 cm	87	2578 s	36.66 cm
13	358 s	36.46 cm	38	1108 s	36.56 cm	63	1858 s	36.61 cm	88	2608 s	36.66 cm
14	388 s	36.47 cm	39	1138 s	36.56 cm	64	1888 s	36.61 cm	89	2638 s	36.66 cm
15	418 s	36.48 cm	40	1168 s	36.56 cm	65	1918 s	36.6 cm	90	2668 s	36.67 cm
16	448 s	36.48 cm	41	1198 s	36.56 cm	66	1948 s	36.61 cm	91	2698 s	36.67 cm
17	478 s	36.49 cm	42	1228 s	36.56 cm	67	1978 s	36.59 cm	92	2728 s	36.67 cm
18	508 s	36.5 cm	43	1258 s	36.56 cm	68	2008 s	36.6 cm	93	2758 s	36.69 cm
19	538 s	36.52 cm	44	1288 s	36.57 cm	69	2038 s	36.61 cm	94	2788 s	36.67 cm
20	568 s	36.52 cm	45	1318 s	36.57 cm	70	2068 s	36.61 cm	95	2818 s	36.69 cm
21	598 s	36.53 cm	46	1348 s	36.57 cm	71	2098 s	36.62 cm	96	2848 s	36.69 cm
22	628 s	36.49 cm	47	1378 s	36.58 cm	72	2128 s	36.62 cm	97	2878 s	36.69 cm
23	658 s	36.5 cm	48	1408 s	36.58 cm	73	2158 s	36.62 cm	98	2908 s	36.69 cm
24	688 s	36.52 cm	49	1438 s	36.58 cm	74	2188 s	36.63 cm	99	2938 s	36.69 cm
25	718 s	36.52 cm	50	1468 s	36.58 cm	75	2218 s	36.63 cm	100	2968 s	36.69 cm

Infiltration Report

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1mpd3 Readings continued

#	Time	Head
101	2998 s	36.7 cm
102	3028 s	36.7 cm
103	3058 s	36.7 cm
104	3088 s	36.69 cm
105	3118 s	36.66 cm
106	3148 s	36.67 cm

Infiltration Report

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1mpd1

Date	4/9/2024
Time	10:56 AM
Latitude	38.140518
Longitude	-122.215576
Initial Volumetric Moisture	60.00 %
Final Volumetric Moisture	80.00 %
Cylinder Size	3 Liter

1mpd1 Results

Map Pin #	3
Test Number	27670
Ksat - mm/hr	NULL
Ksat - in/hr	NULL
Capillary Pressure C mm	NULL
RMS Error of Regression	NULL
Normalized RMS	NULL

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	29 s	31.47 cm	26	778 s	31.54 cm	51	1529 s	31.64 cm	76	2279 s	31.73 cm
2	58 s	31.47 cm	27	809 s	31.55 cm	52	1559 s	31.64 cm	77	2309 s	31.73 cm
3	89 s	31.49 cm	28	839 s	31.55 cm	53	1588 s	31.64 cm	78	2338 s	31.74 cm
4	118 s	31.48 cm	29	868 s	31.56 cm	54	1619 s	31.64 cm	79	2369 s	31.74 cm
5	149 s	31.49 cm	30	899 s	31.56 cm	55	1648 s	31.65 cm	80	2399 s	31.74 cm
6	178 s	31.5 cm	31	928 s	31.56 cm	56	1679 s	31.65 cm	81	2428 s	31.75 cm
7	209 s	31.5 cm	32	959 s	31.57 cm	57	1709 s	31.66 cm	82	2459 s	31.7 cm
8	238 s	31.51 cm	33	988 s	31.57 cm	58	1738 s	31.66 cm	83	2488 s	31.71 cm
9	269 s	31.46 cm	34	1019 s	31.57 cm	59	1769 s	31.66 cm	84	2519 s	31.71 cm
10	298 s	31.47 cm	35	1049 s	31.58 cm	60	1798 s	31.67 cm	85	2549 s	31.72 cm
11	329 s	31.47 cm	36	1078 s	31.58 cm	61	1829 s	31.67 cm	86	2578 s	31.73 cm
12	358 s	31.48 cm	37	1109 s	31.58 cm	62	1859 s	31.68 cm	87	2609 s	31.74 cm
13	389 s	31.49 cm	38	1138 s	31.59 cm	63	1888 s	31.68 cm	88	2638 s	31.75 cm
14	418 s	31.5 cm	39	1169 s	31.59 cm	64	1919 s	31.69 cm	89	2669 s	31.75 cm
15	449 s	31.51 cm	40	1198 s	31.59 cm	65	1948 s	31.69 cm	90	2699 s	31.77 cm
16	479 s	31.51 cm	41	1229 s	31.59 cm	66	1979 s	31.69 cm	91	2728 s	31.75 cm
17	509 s	31.52 cm	42	1258 s	31.61 cm	67	2009 s	31.7 cm	92	2759 s	31.77 cm
18	539 s	31.52 cm	43	1289 s	31.61 cm	68	2038 s	31.7 cm	93	2788 s	31.77 cm
19	568 s	31.53 cm	44	1319 s	31.61 cm	69	2069 s	31.71 cm	94	2819 s	31.77 cm
20	599 s	31.53 cm	45	1348 s	31.62 cm	70	2098 s	31.71 cm	95	2849 s	31.78 cm
21	628 s	31.53 cm	46	1379 s	31.62 cm	71	2129 s	31.71 cm	96	2878 s	31.78 cm
22	659 s	31.53 cm	47	1408 s	31.62 cm	72	2159 s	31.72 cm	97	2909 s	31.78 cm
23	688 s	31.54 cm	48	1439 s	31.63 cm	73	2188 s	31.72 cm	98	2939 s	31.78 cm
24	719 s	31.54 cm	49	1469 s	31.63 cm	74	2219 s	31.72 cm	99	2968 s	31.78 cm
25	749 s	31.54 cm	50	1498 s	31.63 cm	75	2248 s	31.73 cm	100	2999 s	31.78 cm

1mpd1 Readings continued

#	Time	Head
101	3028 s	31.79 cm

Infiltration Report

Engeo San Ramon

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651.237.5123

1mpd5

Date	4/9/2024
Time	12:26 PM
Latitude	38.140563
Longitude	-122.217133
Initial Volumetric Moisture	10.00 %
Final Volumetric Moisture	70.00 %
Cylinder Size	3 Liter

1mpd5 Results

Map Pin #	4
Test Number	27671
Ksat - mm/hr	NULL
Ksat - in/hr	NULL
Capillary Pressure C mm	NULL
RMS Error of Regression	NULL
Normalized RMS	NULL

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	32.37 cm	26	749 s	30.15 cm	51	1499 s	28.31 cm	76	2249 s	26.71 cm
2	29 s	32.15 cm	27	779 s	30.07 cm	52	1529 s	28.24 cm	77	2279 s	26.64 cm
3	59 s	32.03 cm	28	809 s	29.99 cm	53	1559 s	28.18 cm	78	2309 s	26.58 cm
4	89 s	31.91 cm	29	839 s	29.91 cm	54	1589 s	28.11 cm	79	2339 s	26.51 cm
5	119 s	31.82 cm	30	869 s	29.84 cm	55	1619 s	28.05 cm	80	2369 s	26.46 cm
6	149 s	31.72 cm	31	899 s	29.76 cm	56	1649 s	27.97 cm	81	2399 s	26.39 cm
7	179 s	31.63 cm	32	929 s	29.69 cm	57	1679 s	27.91 cm	82	2429 s	26.33 cm
8	209 s	31.54 cm	33	959 s	29.61 cm	58	1709 s	27.85 cm	83	2459 s	26.27 cm
9	239 s	31.46 cm	34	989 s	29.54 cm	59	1739 s	27.78 cm	84	2489 s	26.21 cm
10	269 s	31.38 cm	35	1019 s	29.46 cm	60	1769 s	27.72 cm	85	2519 s	26.14 cm
11	299 s	31.3 cm	36	1049 s	29.39 cm	61	1799 s	27.65 cm	86	2549 s	26.08 cm
12	329 s	31.22 cm	37	1079 s	29.33 cm	62	1829 s	27.6 cm	87	2579 s	26.02 cm
13	359 s	31.14 cm	38	1109 s	29.25 cm	63	1859 s	27.54 cm	88	2609 s	25.96 cm
14	389 s	31.07 cm	39	1139 s	29.18 cm	64	1889 s	27.47 cm	89	2639 s	25.9 cm
15	419 s	31.0 cm	40	1169 s	29.1 cm	65	1919 s	27.42 cm	90	2669 s	25.84 cm
16	449 s	30.92 cm	41	1199 s	29.03 cm	66	1949 s	27.35 cm	91	2699 s	25.79 cm
17	479 s	30.85 cm	42	1229 s	28.96 cm	67	1979 s	27.28 cm	92	2729 s	25.73 cm
18	509 s	30.77 cm	43	1259 s	28.89 cm	68	2009 s	27.22 cm	93	2759 s	25.67 cm
19	539 s	30.69 cm	44	1289 s	28.8 cm	69	2039 s	27.16 cm	94	2789 s	25.61 cm
20	569 s	30.6 cm	45	1319 s	28.74 cm	70	2069 s	27.07 cm	95	2819 s	25.55 cm
21	599 s	30.53 cm	46	1349 s	28.67 cm	71	2099 s	27.02 cm	96	2849 s	25.49 cm
22	629 s	30.46 cm	47	1379 s	28.59 cm	72	2129 s	26.95 cm	97	2879 s	25.43 cm
23	659 s	30.38 cm	48	1409 s	28.52 cm	73	2159 s	26.89 cm	98	2909 s	25.38 cm
24	689 s	30.3 cm	49	1439 s	28.45 cm	74	2189 s	26.82 cm	99	2939 s	25.31 cm
25	719 s	30.22 cm	50	1469 s	28.38 cm	75	2219 s	26.76 cm	100	2969 s	25.25 cm

Infiltration Report

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651.237.5123

1mpd5 Readings continued

#	Time	Head	#	Time	Head
101	2999 s	25.19 cm	133	3959 s	23.4 cm
102	3029 s	25.14 cm	134	3989 s	23.35 cm
103	3059 s	25.08 cm	135	4019 s	23.3 cm
104	3089 s	25.02 cm	136	4049 s	23.25 cm
105	3119 s	24.97 cm	137	4079 s	23.19 cm
106	3149 s	24.91 cm	138	4109 s	23.14 cm
107	3179 s	24.85 cm			
108	3209 s	24.79 cm			
109	3239 s	24.74 cm			
110	3269 s	24.67 cm			
111	3299 s	24.62 cm			
112	3329 s	24.57 cm			
113	3359 s	24.5 cm			
114	3389 s	24.45 cm			
115	3419 s	24.4 cm			
116	3449 s	24.34 cm			
117	3479 s	24.29 cm			
118	3509 s	24.22 cm			
119	3539 s	24.17 cm			
120	3569 s	24.12 cm			
121	3599 s	24.07 cm			
122	3629 s	24.01 cm			
123	3659 s	23.96 cm			
124	3689 s	23.89 cm			
125	3719 s	23.84 cm			
126	3749 s	23.79 cm			
127	3779 s	23.74 cm			
128	3809 s	23.67 cm			
129	3839 s	23.62 cm			
130	3869 s	23.56 cm			
131	3899 s	23.51 cm			
132	3929 s	23.46 cm			

Infiltration Report

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651.237.5123

1mpd2

Date	4/9/2024
Time	1:46 PM
Latitude	38.139652
Longitude	-122.216595
Initial Volumetric Moisture	10.00 %
Final Volumetric Moisture	90.00 %
Cylinder Size	3 Liter

1mpd2 Results

Map Pin #	5
Test Number	27672
Ksat - mm/hr	27
Ksat - in/hr	1.05
Capillary Pressure C mm	-84.2
RMS Error of Regression	1.8
Normalized RMS	0.3%

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	29.75 cm	26	748 s	25.77 cm	51	1498 s	22.67 cm	76	2248 s	19.95 cm
2	28 s	29.52 cm	27	778 s	25.64 cm	52	1528 s	22.55 cm	77	2278 s	19.85 cm
3	58 s	29.3 cm	28	808 s	25.5 cm	53	1558 s	22.45 cm	78	2308 s	19.75 cm
4	88 s	29.11 cm	29	838 s	25.38 cm	54	1588 s	22.33 cm	79	2338 s	19.65 cm
5	118 s	28.92 cm	30	868 s	25.25 cm	55	1618 s	22.22 cm	80	2368 s	19.55 cm
6	148 s	28.74 cm	31	898 s	25.12 cm	56	1648 s	22.11 cm	81	2398 s	19.44 cm
7	178 s	28.56 cm	32	928 s	24.98 cm	57	1678 s	21.99 cm	82	2428 s	19.35 cm
8	208 s	28.39 cm	33	958 s	24.85 cm	58	1708 s	21.88 cm	83	2458 s	19.23 cm
9	238 s	28.24 cm	34	988 s	24.73 cm	59	1738 s	21.76 cm	84	2488 s	19.13 cm
10	268 s	28.09 cm	35	1018 s	24.6 cm	60	1768 s	21.66 cm	85	2518 s	19.03 cm
11	298 s	27.94 cm	36	1048 s	24.47 cm	61	1798 s	21.55 cm	86	2548 s	18.93 cm
12	328 s	27.79 cm	37	1078 s	24.34 cm	62	1828 s	21.43 cm	87	2578 s	18.84 cm
13	358 s	27.65 cm	38	1108 s	24.22 cm	63	1858 s	21.33 cm	88	2608 s	18.73 cm
14	388 s	27.51 cm	39	1138 s	24.11 cm	64	1888 s	21.22 cm	89	2638 s	18.63 cm
15	418 s	27.36 cm	40	1168 s	23.98 cm	65	1918 s	21.12 cm	90	2668 s	18.54 cm
16	448 s	27.22 cm	41	1198 s	23.85 cm	66	1948 s	21.01 cm	91	2698 s	18.44 cm
17	478 s	27.07 cm	42	1228 s	23.74 cm	67	1978 s	20.9 cm	92	2728 s	18.34 cm
18	508 s	26.93 cm	43	1258 s	23.62 cm	68	2008 s	20.8 cm	93	2758 s	18.25 cm
19	538 s	26.78 cm	44	1288 s	23.49 cm	69	2038 s	20.69 cm	94	2788 s	18.14 cm
20	568 s	26.64 cm	45	1318 s	23.37 cm	70	2068 s	20.58 cm	95	2818 s	18.05 cm
21	598 s	26.49 cm	46	1348 s	23.26 cm	71	2098 s	20.48 cm	96	2848 s	17.95 cm
22	628 s	26.34 cm	47	1378 s	23.14 cm	72	2128 s	20.37 cm	97	2878 s	17.85 cm
23	658 s	26.2 cm	48	1408 s	23.02 cm	73	2158 s	20.26 cm	98	2908 s	17.76 cm
24	688 s	26.06 cm	49	1438 s	22.9 cm	74	2188 s	20.16 cm	99	2938 s	17.66 cm
25	718 s	25.92 cm	50	1468 s	22.79 cm	75	2218 s	20.05 cm	100	2968 s	17.57 cm

Infiltration Report

Engeo San Ramon

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1mpd2 Readings continued

#	Time	Head
101	2998 s	17.47 cm
102	3028 s	17.37 cm

Infiltration Report

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1mpd6

Date	4/9/2024
Time	3:19 PM
Latitude	38.146098
Longitude	-122.214913
Initial Volumetric Moisture	30.00 %
Final Volumetric Moisture	80.00 %
Cylinder Size	3 Liter

1mpd6 Results

Map Pin #	6
Test Number	27673
Ksat - mm/hr	NULL
Ksat - in/hr	NULL
Capillary Pressure C mm	NULL
RMS Error of Regression	NULL
Normalized RMS	NULL

Readings

#	Time	Head	#	Time	Head	#	Time	Head	#	Time	Head
1	0 s	26.89 cm	26	748 s	25.56 cm	51	1498 s	24.98 cm	76	2248 s	24.38 cm
2	28 s	26.79 cm	27	778 s	25.52 cm	52	1528 s	24.96 cm	77	2278 s	24.36 cm
3	58 s	26.72 cm	28	808 s	25.49 cm	53	1558 s	24.94 cm	78	2308 s	24.34 cm
4	88 s	26.62 cm	29	838 s	25.47 cm	54	1588 s	24.92 cm	79	2338 s	24.31 cm
5	118 s	26.54 cm	30	868 s	25.44 cm	55	1618 s	24.9 cm	80	2368 s	24.29 cm
6	148 s	26.45 cm	31	898 s	25.42 cm	56	1648 s	24.89 cm	81	2398 s	24.26 cm
7	178 s	26.37 cm	32	928 s	25.39 cm	57	1678 s	24.86 cm	82	2428 s	24.24 cm
8	208 s	26.29 cm	33	958 s	25.36 cm	58	1708 s	24.84 cm	83	2458 s	24.21 cm
9	238 s	26.24 cm	34	988 s	25.33 cm	59	1738 s	24.82 cm	84	2488 s	24.19 cm
10	268 s	26.17 cm	35	1018 s	25.31 cm	60	1768 s	24.81 cm	85	2518 s	24.18 cm
11	298 s	26.13 cm	36	1048 s	25.29 cm	61	1798 s	24.79 cm	86	2548 s	24.14 cm
12	328 s	26.06 cm	37	1078 s	25.27 cm	62	1828 s	24.76 cm	87	2578 s	24.11 cm
13	358 s	26.02 cm	38	1108 s	25.25 cm	63	1858 s	24.75 cm	88	2608 s	24.09 cm
14	388 s	25.99 cm	39	1138 s	25.22 cm	64	1888 s	24.73 cm	89	2638 s	24.07 cm
15	418 s	25.95 cm	40	1168 s	25.2 cm	65	1918 s	24.71 cm	90	2668 s	24.04 cm
16	448 s	25.91 cm	41	1198 s	25.18 cm	66	1948 s	24.69 cm	91	2698 s	24.02 cm
17	478 s	25.88 cm	42	1228 s	25.16 cm	67	1978 s	24.67 cm	92	2728 s	24.0 cm
18	508 s	25.83 cm	43	1258 s	25.14 cm	68	2008 s	24.65 cm	93	2758 s	23.98 cm
19	538 s	25.8 cm	44	1288 s	25.12 cm	69	2038 s	24.63 cm	94	2788 s	23.95 cm
20	568 s	25.76 cm	45	1318 s	25.1 cm	70	2068 s	24.58 cm	95	2818 s	23.93 cm
21	598 s	25.73 cm	46	1348 s	25.08 cm	71	2098 s	24.53 cm	96	2848 s	23.91 cm
22	628 s	25.68 cm	47	1378 s	25.06 cm	72	2128 s	24.5 cm	97	2878 s	23.88 cm
23	658 s	25.65 cm	48	1408 s	25.03 cm	73	2158 s	24.47 cm	98	2908 s	23.86 cm
24	688 s	25.62 cm	49	1438 s	25.01 cm	74	2188 s	24.44 cm	99	2938 s	23.83 cm
25	718 s	25.59 cm	50	1468 s	25.0 cm	75	2218 s	24.42 cm	100	2968 s	23.82 cm

Infiltration Report

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1mpd6 Readings continued

#	Time	Head	#	Time	Head
101	2998 s	23.8 cm	133	3958 s	23.46 cm
102	3028 s	23.78 cm	134	3988 s	23.43 cm
103	3058 s	23.76 cm	135	4018 s	23.42 cm
104	3088 s	23.74 cm	136	4048 s	23.4 cm
105	3118 s	23.71 cm	137	4078 s	23.38 cm
106	3148 s	23.69 cm	138	4108 s	23.35 cm
107	3178 s	23.67 cm	139	4138 s	23.34 cm
108	3208 s	23.66 cm	140	4168 s	23.33 cm
109	3238 s	23.63 cm	141	4198 s	23.31 cm
110	3268 s	23.62 cm	142	4228 s	23.29 cm
111	3298 s	23.6 cm	143	4258 s	23.28 cm
112	3328 s	23.58 cm	144	4288 s	23.26 cm
113	3358 s	23.65 cm	145	4318 s	23.25 cm
114	3388 s	23.65 cm	146	4348 s	23.22 cm
115	3418 s	23.66 cm	147	4378 s	23.2 cm
116	3448 s	23.66 cm	148	4408 s	23.17 cm
117	3478 s	23.66 cm	149	4438 s	23.14 cm
118	3508 s	23.65 cm	150	4468 s	23.11 cm
119	3538 s	23.64 cm	151	4498 s	23.07 cm
120	3568 s	23.63 cm	152	4528 s	23.03 cm
121	3598 s	23.61 cm	153	4558 s	23.0 cm
122	3628 s	23.6 cm	154	4588 s	22.98 cm
123	3658 s	23.61 cm	155	4618 s	22.95 cm
124	3688 s	23.61 cm	156	4648 s	22.91 cm
125	3718 s	23.59 cm	157	4678 s	22.89 cm
126	3748 s	23.58 cm	158	4708 s	22.84 cm
127	3778 s	23.55 cm	159	4738 s	22.8 cm
128	3808 s	23.54 cm			
129	3838 s	23.53 cm			
130	3868 s	23.51 cm			
131	3898 s	23.49 cm			
132	3928 s	23.47 cm			

APPENDIX C

LABORATORY TEST DATA

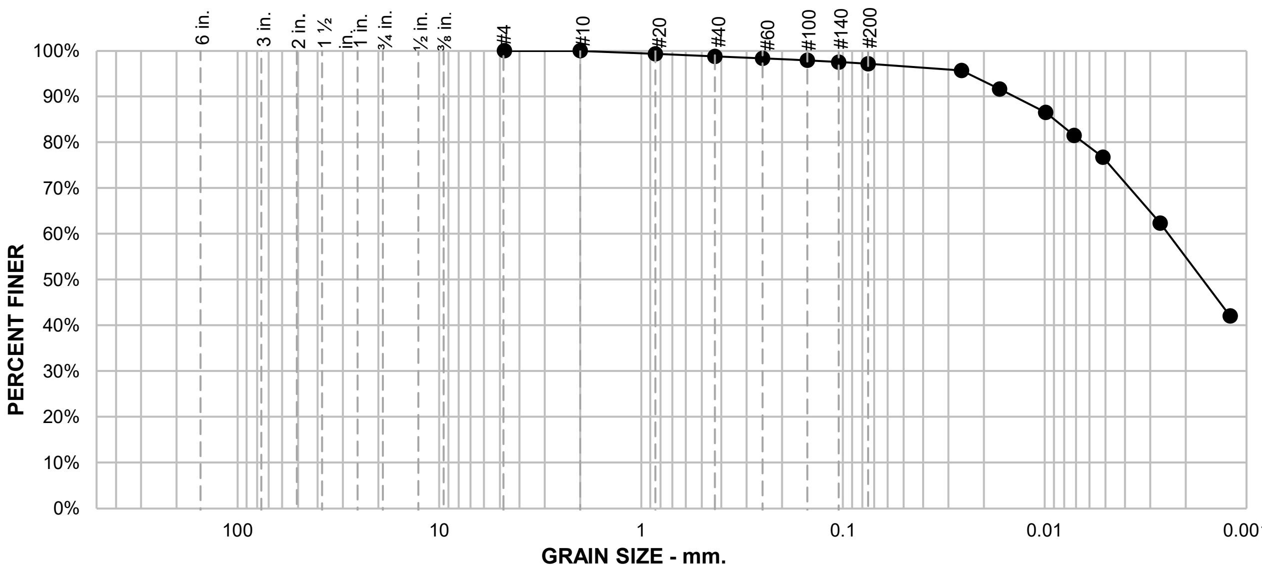
MOISTURE-DENSITY DETERMINATION REPORT
ASTM D7263

SAMPLE ID	1-B3@6							
DEPTH (ft.)	6							
METHOD A OR B	B							
MOISTURE CONTENT (%)	14.1							
DRY DENSITY (pcf)	105.9							

ENGEO
Expect Excellence

CLIENT: Acorn Environmental
PROJECT NAME: Scotts Valley Development
PROJECT NO: 16484.000.001 PH001 T003
PROJECT LOCATION: Vallejo, CA
REPORT DATE: 5/10/2024
TESTED BY: L. Schmitz
REVIEWED BY: M. Gilbert

PARTICLE SIZE DISTRIBUTION REPORT
ASTM D422



SAMPLE ID: 1-B1@69-69.5

DEPTH (ft): 69-69.5

% +75mm	% GRAVEL		% SAND			% FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
				1.2	1.6	42.3	54.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#20	99.3		
#40	98.8		
#60	98.3		
#100	97.9		
#140	97.5		
#200	97.2		
0.0259 mm.	95.7		
0.0167 mm.	91.6		
0.0099 mm.	86.6		
0.0072 mm.	81.5		
0.0051 mm.	76.7		
0.0027 mm.	62.4		
0.0012 mm.	42.0		

SOIL DESCRIPTION

See exploration logs

ATTERBERG LIMITS

PL = 17 LL = 43 PI = 26

COEFFICIENTS

D_{90} = 0.0141 mm D_{85} = 0.0089 mm D_{60} = 0.0024 mm

D_{50} = 0.0016 mm D_{30} = D_{15} =

D_{10} = C_u = C_c =

CLASSIFICATION

USCS = CL

REMARKS

Silt/clay division of 0.002mm used
PI: ASTM D4318, Wet Method
USCS: ASTM D2487

* (no specification provided)

CLIENT: Acorn Environmental

PROJECT NAME: Scotts Valley Development

PROJECT NO: 16484.000.001 PH001

PROJECT LOCATION: Vallejo, CA

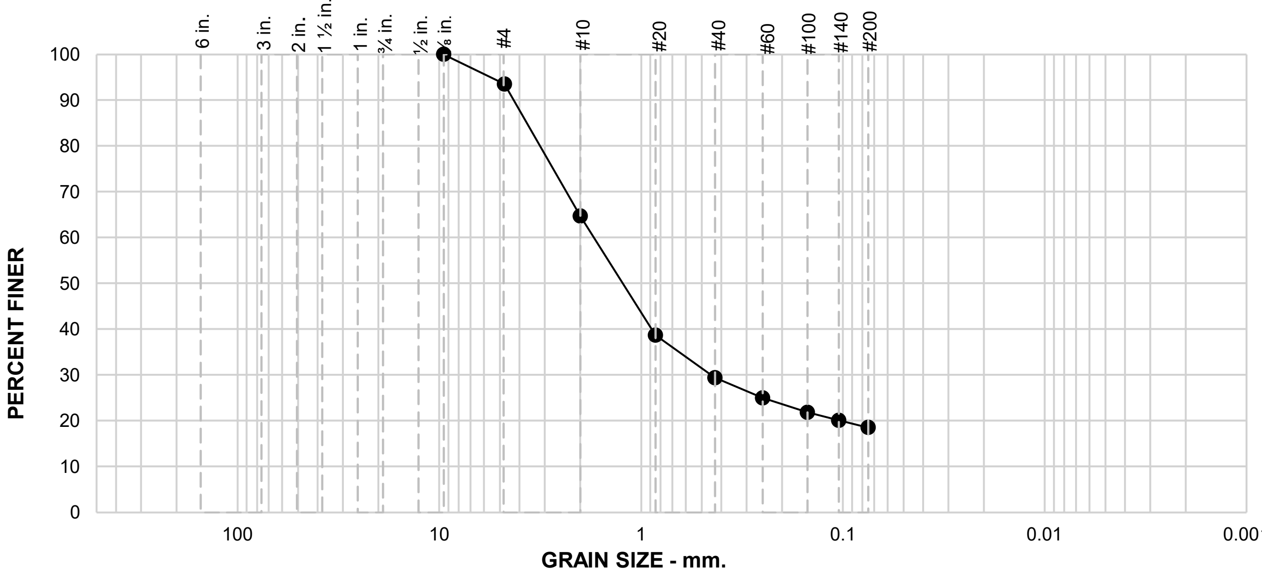
REPORT DATE: 5/9/2024

TESTED BY: G. Criste

REVIEWED BY: D. Seibold

ENGEO Expect Excellence

PARTICLE SIZE DISTRIBUTION REPORT
ASTM D6913, Method A



SAMPLE ID: 1-B2@8.5

DEPTH (ft): 8.5

LOCATION: 1-B2 at 8.5 feet

% +75mm	% GRAVEL		% SAND			% FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
		6	29	36	10	19	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
⅜ in.	100		
#4	94		
#10	65		
#20	39		
#40	29		
#60	25		
#100	22		
#140	20		
#200	19		

SOIL DESCRIPTION

See exploration logs

ATTERBERG LIMITS

PL = LL = PI =

COEFFICIENTS

D_{90} = 4.2158 mm D_{85} = 3.6317 mm D_{60} = 1.6965 mm

D_{50} = 1.2208 mm D_{30} = 0.4603 mm D_{15} =

D_{10} = C_u = C_c =

CLASSIFICATION

USCS =

REMARKS

* (no specification provided)

CLIENT: Acorn Environmental

PROJECT NAME: Scotts Valley Development

PROJECT NO: 16484.000.001 PH001 T003

PROJECT LOCATION: Vallejo, CA

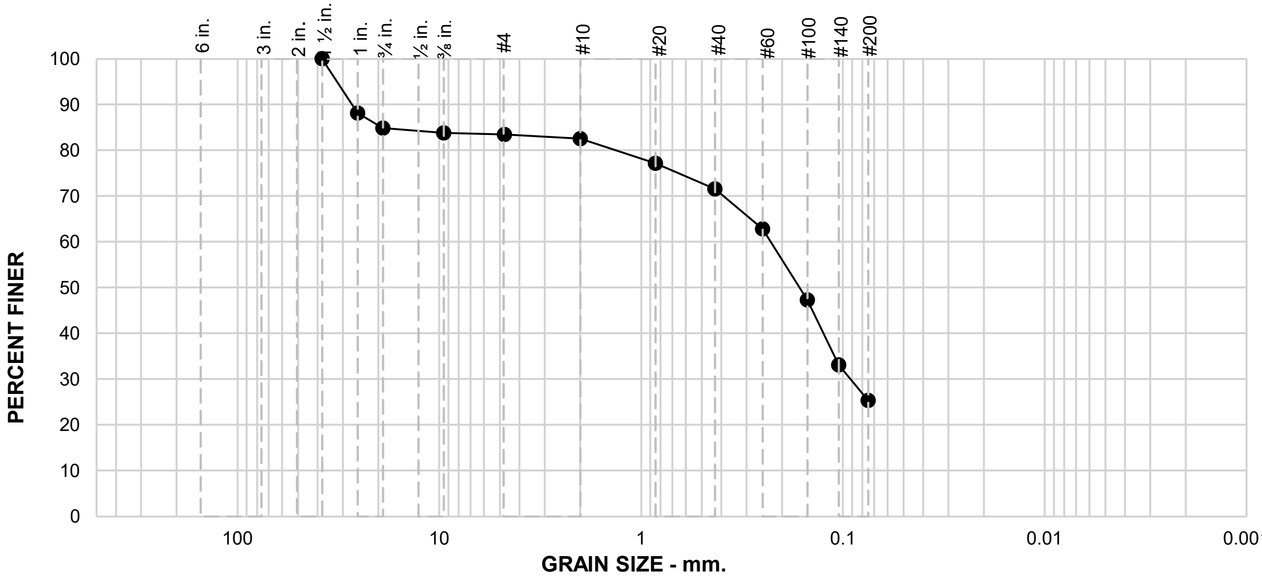
REPORT DATE: 5/15/2024

TESTED BY: M. Ryan

REVIEWED BY: M. Gilbert

PARTICLE SIZE DISTRIBUTION REPORT

ASTM D6913, Method A



SAMPLE ID: 1-B3@2.5

DEPTH (ft): 2.5

% +75mm	% GRAVEL		% SAND			% FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
	15	2		11	47	25	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-½ in.	100		
1 in.	88		
¾ in.	85		
⅜ in.	84		
#4	83		
#10	83		
#20	77		
#40	72		
#60	63		
#100	47		
#140	33		
#200	25		

SOIL DESCRIPTION

See exploration logs

ATTERBERG LIMITS

PL = LL = PI =

COEFFICIENTS

D_{90} = 27.1758 mm D_{85} = 19.0500 mm D_{60} = 0.2272 mm

D_{50} = 0.1651 mm D_{30} = 0.0926 mm D_{15} =

D_{10} = C_u = C_c =

CLASSIFICATION

USCS =

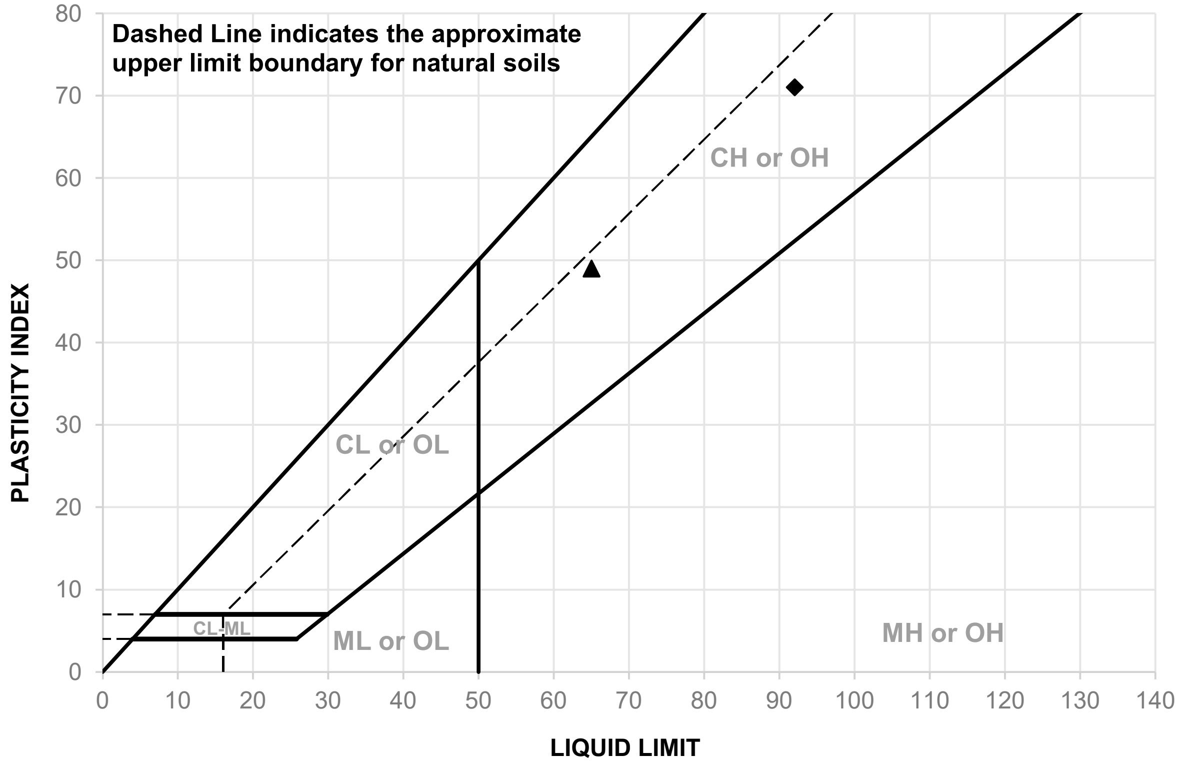
REMARKS

* (no specification provided)

ENGEO Expect Excellence

CLIENT: Acorn Environmental
PROJECT NAME: Scotts Valley Development
PROJECT NO: 16484.000.001 PH001 T003
PROJECT LOCATION: Vallejo, CA
REPORT DATE: 5/15/2024
TESTED BY: M. Ryan
REVIEWED BY: M. Gilbert

LIQUID AND PLASTIC LIMITS TEST REPORT
ASTM D4318



	SAMPLE ID	DEPTH (ft)	MATERIAL DESCRIPTION	LL	PL	PI
▲	1-B1@3.5	3.5	See exploration logs	65	16	49
◆	1-B2@1.5	1.5	See exploration logs	92	21	71

	SAMPLE ID	TEST METHOD	REMARKS
▲	1-B1@3.5	PI: ASTM D4318, Wet Method	
◆	1-B2@1.5	PI: ASTM D4318, Wet Method	

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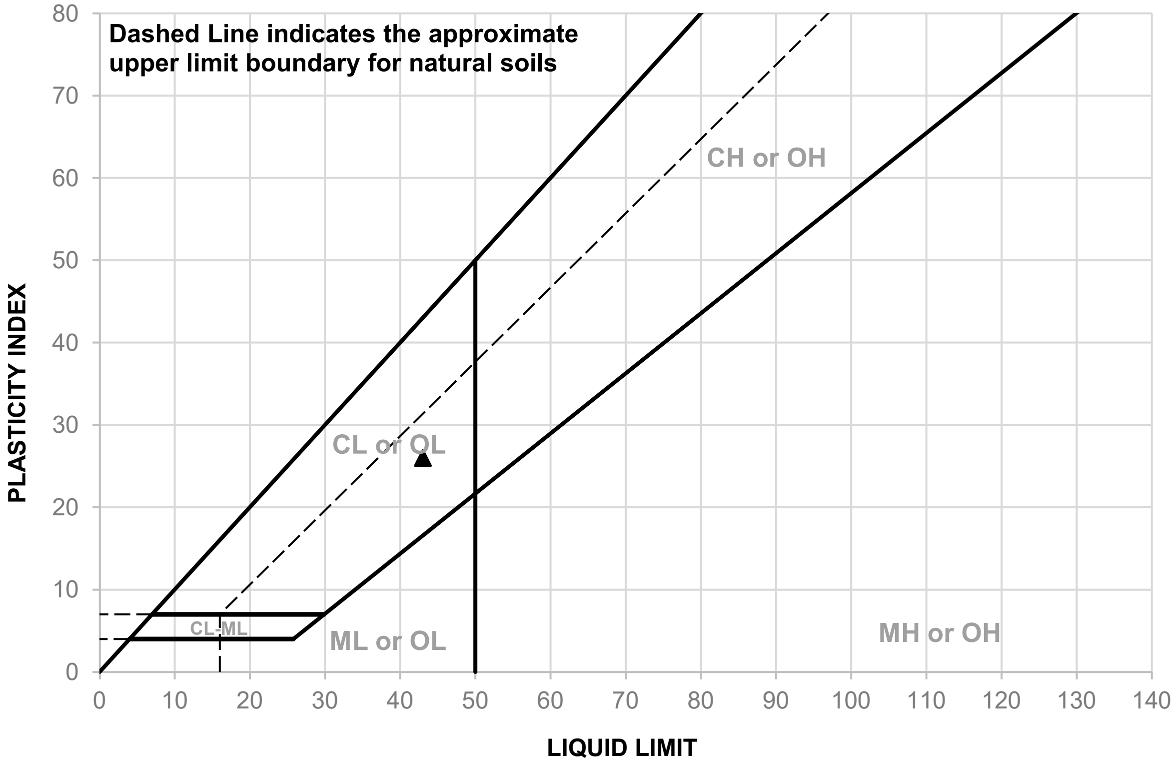
CLIENT: Acorn Environmental
PROJECT NAME: Scotts Valley Development
PROJECT NO: 16484.000.001 PH001 T003
PROJECT LOCATION: Vallejo, CA
REPORT DATE: 5/15/2024
TESTED BY: R. Montalvo
REVIEWED BY: M. Gilbert

LIQUID AND PLASTIC LIMITS TEST REPORT
ASTM D4318



	SAMPLE ID	DEPTH (ft)	MATERIAL DESCRIPTION	LL	PL	PI
▲	1-B1@69-69.5	69-69.5	See exploration logs	43	17	26

	SAMPLE ID	TEST METHOD	REMARKS
▲	1-B1@69-69.5	PI: ASTM D4318, Wet Method	

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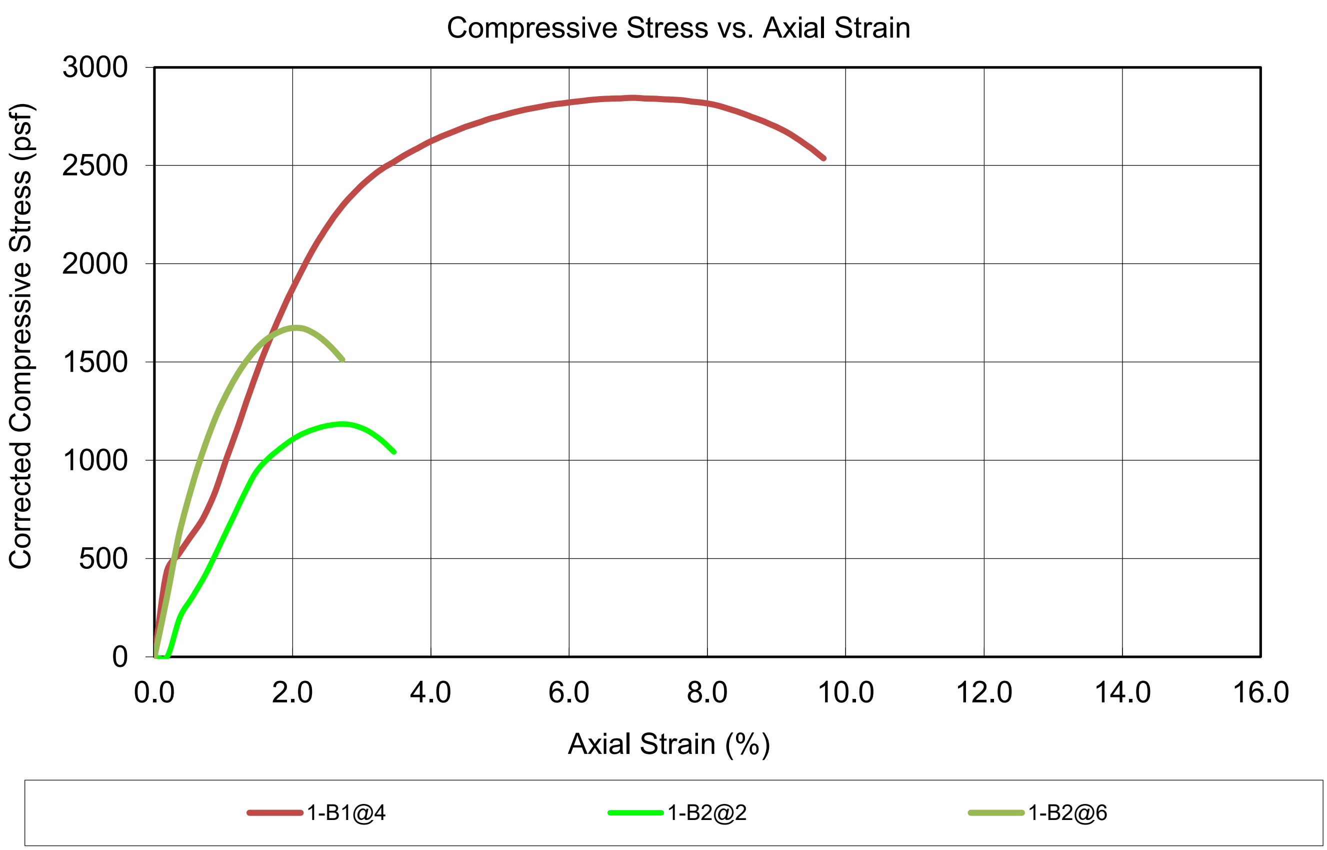
CLIENT: Acorn Environmental
PROJECT NAME: Scotts Valley Development
PROJECT NO: 16484.000.001 PH001
PROJECT LOCATION: Vallejo, CA
REPORT DATE: 5/8/2024
TESTED BY: O. Espinoza
REVIEWED BY: G. Criste

UNCONFINED COMPRESSION TEST REPORT
(ASTM D2166)



BEFORE TEST	SPECIMEN 1-B1@4	SPECIMEN 1-B2@2	SPECIMEN 1-B2@6
Test Moisture Content (%)	21.71	36.34	29.99
Dry Density (pcf)	106.3	79.0	92.5
Saturation (%)	98.8	86.0	97.6
Void Ratio	0.60	1.15	0.84
Diameter (in)	2.403	2.385	2.402
Height (in)	5.787	5.487	5.520
Height-To-Diameter Ratio	2.41	2.30	2.30
TEST DATA			
Unconfined Compressive Strength (psf)	2845	1186	1673
Undrained Shear Strength (psf)	1422.3	592.8	836.7
Strain Rate (in/min)	0.050	0.050	0.050
Specific Gravity (ASSUMED)	2.720	2.720	2.720
Strain at Failure(%)	6.91	2.73	1.99
Test Remarks			

SPECIMEN	DESCRIPTION
1-B1@4	See exploration logs
1-B2@2	See exploration logs
1-B2@6	See exploration logs

PROJECT NAME: Scotts Valley Development
PROJECT NO: 16484.000.001 PH001 T003
CLIENT: Acorn Environmental
LOCATION: Vallejo, CA

Test Date: 5/14/24
Tested By: L. Schmitz
Reviewed By: M. Gilbert

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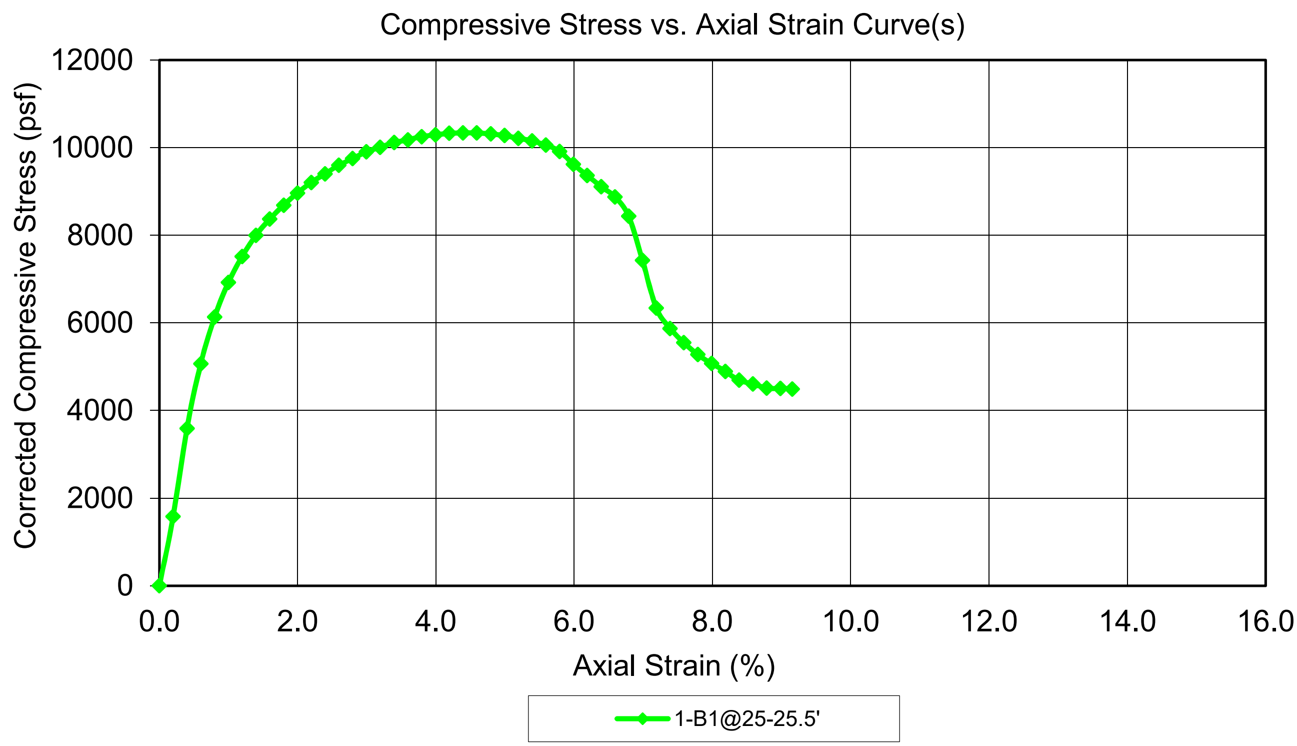
UNCONFINED COMPRESSION TEST REPORT
(ASTM D2166)



BEFORE TEST	SPECIMEN 1-B1@25-25.5'
Test Moisture Content (%)	10.35
Dry Density (pcf)	131.8
Saturation (%)	97.7
Void Ratio	0.29
Diameter (in)	2.413
Height (in)	5.009
Height-To-Diameter Ratio	2.08
TEST DATA	
Unconfined Compressive Strength (psf)	10335.20
Undrained Shear Strength (psf)	5167.60
Strain Rate (in/min)	0.050
Specific Gravity (ASSUMED)	2.720
Strain at Failure(%)	4.59
Test Remarks	

SPECIMEN	DESCRIPTION
1-B1@25-25.5'	See exploration logs

PROJECT NAME: Scotts Valley Development
PROJECT NO: 16484.000.001 PH001 T003
CLIENT: Acorn Environmental
LOCATION: Vallejo, CA

Test Date: 5/6/2024
Tested By: O. Espinoza
Reviewed By: G. Criste

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APPENDIX D

HYDROGEOLOGIC ASSESSMENT

Project No.
16484.000.001

May 2, 2024

Ms. Bibiana Sparks
Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762

Subject: Scotts Valley Development
Admiral Callaghan Lane and Columbus Parkway
Vallejo, California

HYDROGEOLOGIC ASSESSMENT

Dear Ms. Sparks:

At your request, we have prepared this hydrogeologic assessment for the Scotts Valley Development in Vallejo, California. The purpose of this report is to assess the existing sources of groundwater at the site for potential use within the project.

Our scope of services included the following items.

- Research and review of relevant and available data for the site, including:
  - published geologic maps,
  - groundwater reports prepared by California Department of Water Resources (DWR),
  - available well records and reports from DWR and local agencies, and
  - published Caltrans records of Hunter Hill Landslide and associated drainage gallery.
- Characterization of surface and subsurface geology based on site exploration and published geologic maps
- Field reconnaissance of springs
- Preparation of this report

DOCUMENT REVIEW

Hunter Hill Landslide

An existing landslide, called the Hunter Hill landslide, is located on the northwestern portion of the site. The landslide crosses Interstate 80 (I-80), and is estimated to be approximately 1,300 feet long, 600 feet wide, and approximately 60 feet deep. Ongoing roadway distress has been documented due to continued movement of the landslide. Inclinometers installed by Caltrans near the slide showed movement below I-80 at approximately 30 feet below the roadway surface between 2003 and 2005 (Caltrans, 2005).

According to documentation by Caltrans, a vertical drainage gallery was partially constructed in 1990 through the existing landslide above I-80 in order to reduce water pressures in the landslide, at the approximate location shown in Exhibit 1. The drainage gallery was to consist of vertical sand drains 3 feet in diameter, approximately 53 feet deep, and spaced at 6 feet on-center, interconnected at the bottom by overlapping bells. The gallery was intended to be drained to the southwest under I-80 by a horizontal perforated pipe (Caltrans, 1988).

We did not observe the drainage gallery during our site reconnaissance. According to Caltrans documentation, the bottom drain from the drainage gallery was never completed due to the presence of hard rock and difficult drilling conditions. Additionally, the final constructed depth and extents of the vertical wells is not known since construction was terminated before project completion (Caltrans 1990a, 1990b). Therefore, an elevated water table may still be present in this area of the slide. Groundwater depth fluctuates between approximately 10 and 14 feet below ground surface near the gallery (Caltrans, 2005).

Existing Wells

Based on our review of the available DWR Well Completion Report (WCR) database, no groundwater wells were identified on the site or within a ½ mile radius of the site.

Napa-Sonoma Lowlands Subbasin

The site is located in upland bedrock terrain and outside of a designated groundwater basin. The site lies about $^{1}/_{3}$ mile east of the eastern boundary of the Napa-Sonoma Lowlands Groundwater Subbasin. The typical "water bearing formations" in the basin include Holocene and Pleistocene Alluvium, and Pleistocene Huichica Formation. We encountered Pleistocene alluvium and colluvium during our explorations to depths of up to 13 feet. The local groundwater conditions at the site would be characterized as fractured bedrock with an unknown water-bearing capacity within the Great Valley Sequence and silica-carbonate rock.

GEOLOGY

Our hydrogeologic characterization is based on our preliminary geotechnical exploration at the site. Geologic units encountered during our exploration include:

- **Artificial fill (af)** – In our explorations, artificial fill consists of bedrock-derived sand and gravel mixed with clay.
- **Alluvium and colluvium, undivided (Qa, Qc)** – Holocene and late Pleistocene deposits. In our explorations, this material generally consists of sandy and gravelly stiff to very stiff clay, with local lenses of increased sand and gravel fractions underlying surficial clay deposits.
- **Landslide Deposits (Qls)** – Holocene and Pleistocene deposits. Deposits near the north landslide (Hunter Hill Landslide) consisted primarily of gravelly lean clay and highly sheared shale and sandstone. Deposits near the south landslide consisted of sheared shale and mudstone in a clay matrix.
- **Great Valley Sequence (Kgv)** – Cretaceous age sandstone, siltstone, shale, and minor conglomerates. On the project site, this unit predominantly consists of siltstone and shale with minor sandstone.
- **Silica-Carbonate Rock (sc)** – Part of the Jurassic-age Coast Range Ophiolite sequence, which contains basalt, gabbro, and serpentinite. Serpentinite locally contains pyroxenite and silica-carbonate rock.

GROUNDWATER

During our field exploration, we encountered groundwater in one of our borings (1-B2) at a depth of 14 feet below the existing ground surface within Great Valley Sequence rock. Water was not encountered in Boring 1-B3 to final depth of the boring (60 feet). The depth to groundwater was not identified in Boring 1-B1 due to the drilling methods used. We also observed surface water flowing in small streams at the locations shown in blue in Exhibit 1. Reports from Caltrans indicate that groundwater depths near the drainage gallery (shown in Exhibit 1) fluctuate seasonally between approximately 10 to 14 feet (Caltrans, 2005).

Fluctuations in the level of groundwater may occur due to variations in rainfall, irrigation practice, and other factors not evident at the time measurements were made.

FIELD RECONNAISSANCE OF SPRINGS

Four springs are present on or near the project site, as shown in Exhibit 1 – Site Plan. During our field exploration between April 22 and April 25, 2024, we performed a reconnaissance of the springs to assess their current condition. In a channel flowing from the easternmost spring, we estimated flow rates at three locations that ranged from ¼ gallon per minute (gpm) to 2½ gpm. Additionally, we observed water flowing from a culvert out of the southernmost spring at a rate of approximately 3 gpm. We consider these field estimates to be preliminary, and not representative of the total flow from the springs.

We also reviewed aerial imagery available on Google Earth from 1993 to 2023 to understand and estimate the seasonal fluctuation in flow from the springs. The streams are generally more active during winter and spring months and have a reduced vegetated area during summer and fall months, especially during drought years. Dry or drought conditions are evident in aerial imagery from May 2022, September 2010, and July 1993, as shown in Appendix A.

EXHIBIT 1: Site Plan

CONCLUSIONS

Water sources present on the site include surface water, four springs located along the boundaries of existing landslides and at geologic contacts, groundwater within alluvium and colluvium soil layers, and groundwater within fractured bedrock.

We note the following considerations regarding using water from these sources.

- Groundwater supply wells are not located on the project site or nearby. Our research did not identify previous well pump tests conducted in either soil or rock units on or near the site. It is also not known whether fractures throughout the Great Valley rock and silica-carbonate rock will provide sufficient flow to develop groundwater supply wells. Therefore, the potential yield of these materials is uncertain.
- The output from the springs is not known, although seasonal fluctuation and drought periods will result in reduced spring flow.
- The depth of colluvium and alluvium at the site is variable. In our explorations, we identified colluvium/alluvium thicknesses ranging from 3 to 13 feet, with alluvium and colluvium deposits covering approximately one quarter of the site. The lateral continuity or presence of groundwater in these deposits is unknown.
- Colluvium contains high concentrations of clay which may result in low yield conditions. We did not encounter continuous layers of sand or gravel in our explorations.
- Historical mercury mining operations were present at multiple locations near the site, including St. John's Mine located less than 1 mile northeast of the site. We consider it feasible that groundwater from both upper soil units and deeper bedrock in this area may be contaminated with heavy metals due to the historical mining operations and possible flow of water through rocks containing heavy metals.

If you have any questions or comments regarding this letter, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

Anne Robertson, PE James Thurber, CEG

awr/jet/ca

Attachments: Selected References
Appendix A

SELECTED REFERENCES

1. California Department of Water Resources (DWR). 2024. Online System for Well Completion Reports.

2. Caltrans. 2005. Memorandum: Geotechnical Recommendation for Roadway Rehab Project, File No. 04-SOL-80, KP 6.3-13.0/PM 3.9-8.1.

3. Caltrans. 1990a. Memorandum: Results of Field Investigation and Decision regarding Future of Project, File No. 10-339203, 10-SOL-80, PM 6.3.

4. Caltrans. 1990b. Memorandum: Field Investigation for Redesign of Project, File No. 10-339203, 10-SOL-80, PM 6.4.

5. Caltrans. 1988. Memorandum: Seismic Investigation of the Hunter Hill Slide near Vallejo, File No. 10-5S6000, 10-SOL-80-6.0.

6. California Department of Water Resources (DWR). 2014. Bulletin 118, Napa-Sonoma Valley groundwater Basin, Napa-Sonoma Lowlands Subbasin.

APPENDIX A

APPENDIX A

AERIAL PHOTO REVIEW

PHOTO A-1: Google Earth Imagery, August 2023, Summer Conditions Following Historical Winter and Spring Rainfall

PHOTO A-2: Google Earth Imagery, May 2023, Spring Conditions Following Historical Rainfall

PHOTO A-3: Google Earth Imagery, May 2022, Spring Conditions Following 10+ Year Drought

PHOTO A-4: Google Earth Imagery, October 2020, Fall Conditions Following Second Driest October on Record in California and 8+ Year Drought

PHOTO A-5: Google Earth Imagery, September 2018, Fall Conditions Following Sixth Driest September on Record in California

PHOTO A-6: Google Earth Imagery, August 2014, Summer Conditions after a Severely Dry Month, and at Beginning of Exceptional Drought Levels

PHOTO A-7: Google Earth Imagery, September 2010, Fall Conditions Following 3+ Year Drought

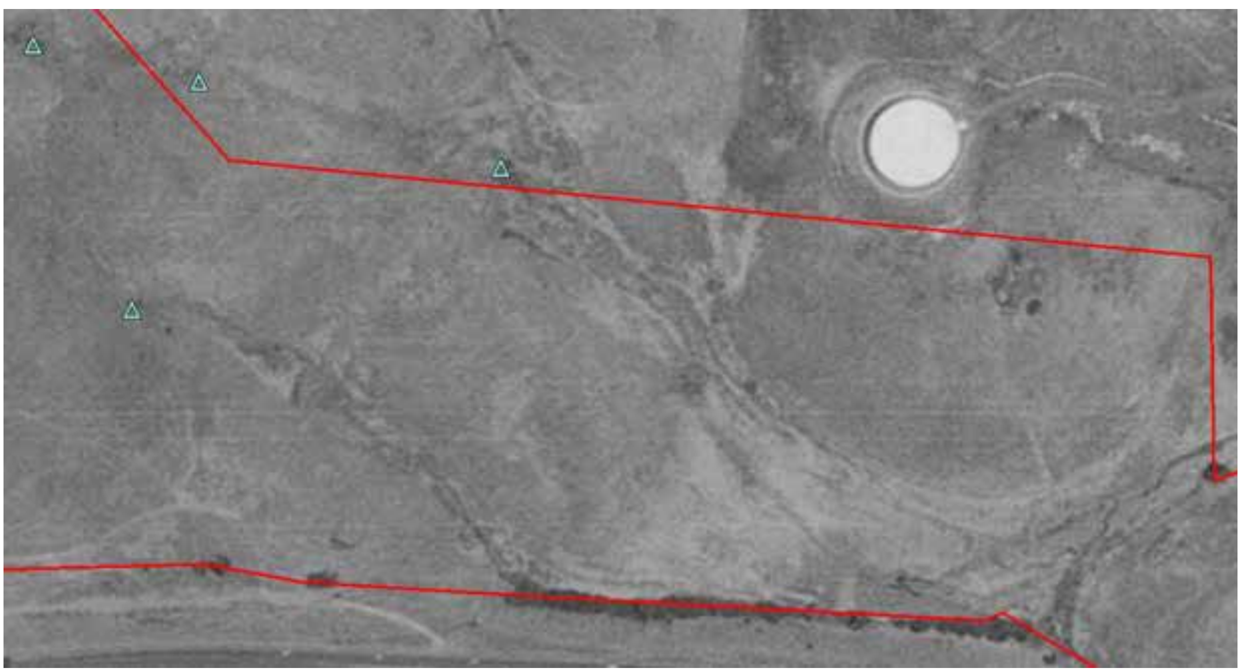
PHOTO A-8: Google Earth Imagery, May 2008, Summer Conditions Following One Year of Extreme Drought

PHOTO A-9: Google Earth Imagery, August 2004, Summer Conditions Following 3+ Year Drought

PHOTO A-10: Google Earth Imagery, July 2003, Summer Conditions Amid Extreme Drought

PHOTO A-11: Google Earth Imagery, July 2002, Summer Conditions Amid Extreme Drought

PHOTO A-12: Google Earth Imagery, July 1993, Summer Conditions Following 6+ Year Drought from 1986 to 1992



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Appendix E

Expanded Regulatory and Environmental Setting

Expanded Regulatory and Environmental Setting

INTRODUCTION

This section summarizes the framework of laws, regulations, and agreements pertaining to the site and actions outlined throughout this Environmental Assessment (EA) as well as supplemental information regarding the environmental setting. The relevant legislation is organized by resource category, and while most regulations discussed within the document are described here, this list is not comprehensive and is limited to the primary regulations relevant to the analysis within the EA.

LAND RESOURCES – SECTION 3.2 OF THE EA

Regulatory Setting

Federal

Clean Water Act

The Clean Water Act (CWA) prohibits sediment and erosion discharge into navigable waters of the United States and establishes water quality goals. The State Water Resources Control Board (SWRCB) requires a Construction General Permit if a project will disturb one or more acres of soil. A site-specific Stormwater Pollution Prevention Plan (SWPPP) is required under this permit. For more information on the CWA and the SWRCB, see **Water Resources – Section 3.3 of the EA** below.

State and Local

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act; formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972 after the 1971 San Fernando earthquake, requires the delineation of zones along active and potentially active faults in California. The California Geological Survey defines an “active” fault as one that exhibits evidence of activity during the last 11,000 years. Faults that exhibit evidence of Quaternary activity (within the last 1.6 million years) are considered to be “potentially active.” The purpose of the Alquist-Priolo Act is to regulate development on or near fault traces to reduce the hazard of fault rupture and to prohibit the location of most off-Reservation structures for human occupancy across these traces.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was enacted in 1990 to protect the public from the effects of strong ground shaking, liquefaction, landslides, ground failure, or other hazards caused by earthquakes. This act requires a state geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within the portions of those zones where they have jurisdiction. Before a development permit is granted by a city, county or other local permitting agency for a site within a seismic hazard zone, a geotechnical investigation must be conducted, and appropriate mitigation measures must be incorporated into the project's design.

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act of 1975 requires all jurisdictions to incorporate mapped mineral resources designations approved by the California Mining and Geology Board within their general plans. The Surface Mining and Reclamation Act was enacted to limit new development in areas with significant mineral deposits. The California Department of Conservation's Office of Mine Reclamation and the California Mining and Geology Board are jointly charged with ensuring proper administration of the act's requirements. The California Mining and Geology Board circulates regulations to clarify and interpret the act's provisions and also serves as a policy and appeals board.

City of Vallejo General Plan 2040

The Propel Vallejo General Plan 2040 is a comprehensive long-term planning document that outlines the vision, goals, policies, and strategies for the future development and growth of Vallejo, California, up to the year 2040. It serves as a blueprint for guiding land use, transportation, housing, economic development, environmental conservation, and other aspects of community development within the city.

Nature and Built Environment Element

The General Plan is the City's primary land use regulatory tool and outlines the steps needed to achieve the community's vision for the future. The Nature and Built Environment Element includes goals, policies, and actions relating to five key goals: Beautiful City, A Place Where People Want to Be, Pride in Identity, Iconic Waterfront, and Hazard Protection.

Goal NBE-5: Hazard Protection: Protect life and property from natural and human-made hazards.

> **Policy NBE-5.4**: Project Location and Design. Prohibit development in any area where it is determined that the potential risk from natural hazards cannot be mitigated to acceptable levels.
>
>> **Action NBE-5.4A:** Continue to require geotechnical studies for land use proposals to determine engineering measures that may be necessary to adequately mitigate any seismic, flooding, sea level rise, landslide, erosion, or related risk.
>>
>> **Action NBE-5.4B:** Continue to require drainage and erosion control measures for landslide-prone or geologically hazardous hillside areas to minimize risks to downhill areas.
>>
>> **Action NBE-5.4C:** Continue to use the development review process to ensure that development is planned and constructed to resist the encroachment of uncontrolled fire.
>>
>> **Action NBE-5.4D:** Locate public facilities that are critical to health and safety (such as police and fire stations, and water and sewer facilities) so as to minimize potential impacts from hazards.

Environmental Setting

Geological Setting

The Project Site is located within the central portion of the Coast Range Geomorphic Province of California. The site is underlain by Jurassic and Cretaceous age Great Valley sedimentary rocks. The northeast and eastern edge of the site are overridden by thrust-blocks of Jurassic Coast Range Ophiolite sequence silica-carbonate rock (Graymer et al., 1999). As described in **Appendix D**, expansive landslides occur in the area through both Great Valley Sequence rock and silica-carbonate rock found on the southern slope of Sulphur Springs Mountain (Graymer et al., 1999).

Topography

The existing topography of the Project Site consists of hilly and hummocky terrain. The site has a steep hillside at the base of Sulphur Springs Mountain which slopes towards the southwest. On the western and northern portion of the property the ground slopes uphill at higher slope inclinations with elevations ranging from 130 feet (southeast corner) to 800 feet (northeast corner) above mean sea level (amsl) and ground sloping towards Columbus Parkway. The average grade across the Project Site is 13 percent from north to south. While the Project Site is undeveloped, it has been subject to grading activities associated with the construction of the adjacent interstate and interchange. A fill slope was constructed along the western property boundary in the 1950s, which was later expanded towards the east in the 1960s, while the knoll in the southwestern portion of the site was cut down by approximately 60 feet of material during highway upgrades in the 1970s (**Appendix D**).

Soil Types and Characteristics

The Project Site contains four soil types: Clear Lake clay, 0 to 2 percent slopes; Clear Lake clay, drained, 2 to 5 percent slopes; Dibble-Los Osos clay loams, eroded, 30 to 50 percent slopes; and Toomes stony loam, eroded, 30 to 75 percent slopes.

The hydrologic soil group is a classification based on the runoff potential of the soils when thoroughly wet, which is defined by the Natural Resource Conservation Service (NRCS) as being under the conditions of maximum yearly wetness (NRCS, 2007). Soils are grouped into four classes that grade from A to D, with A being coarse-grained soils with high infiltration and low runoff potential and D being mostly fine-grained clays with extremely slow infiltration and high runoff potential. The soils on the Project Site have hydrologic ratings of C/D and D, indicating the soils have slow to very slow infiltration rates and moderately fine or fine, claypan, and clayey textures (NRCS, 2024).

Saturated hydraulic conductivity [Ksat] is a quantitative measurement for the movement of water through saturated soil or the ease with which pores in a saturated soil transmit water. Ksat is a factor in determining the hydrologic soil group and is often used in the design of water and wastewater disposal features such as percolation ponds and septic systems. Ksat measures transport only in a vertical direction under completely saturated conditions.

Soil erosion is the wearing and removal of soil materials from the ground surface and the transportation of these soil materials resulting in deposition elsewhere. Mechanisms of soil erosion include stormwater runoff and wind as well as human activities. Factors that influence erosion include physical properties of the soil, topography, annual rainfall, and peak intensity. Soils on the Project Site transmit water at varying rates, including moderately low to high rates. This indicates that the majority of the Project Site has a high to very high surface runoff potential, and a small portion of the Project Site water infiltrates at a moderately low rate instead of running off. Subsurface testing at the Project Site illustrated that the Project Site has groundwater depths that fluctuate seasonally between 10 to 14 feet (**Appendix D**).

Corrosivity pertains to a soil-induced electrochemical or chemical reaction that corrodes concrete or steel. The soils on the Project Site have low to moderate risks of corrosion to concrete and low to high risks of corrosion to steel (NRCS, 2024).

Expansive soils may increase in volume when water is absorbed and may shrink when dried, as expansive soils are largely comprised of clays. The property of expansion is measured using linear extensibility. Expansive soils are of concern because they can cause building foundations to rise during the rainy season and fall during the dry season, causing structural distortion. The soils on the Project Site have mapped low-to-very high linear extensibility ratings and therefore are considered to be expansive soils. Field exploration was conducted, which included infiltration testing, borings, test pits, and laboratory analysis of soil samples (**Appendix D**). Three borings were drilled ranging in depths from 43 to 75.5 feet below existing grade. The boring and core logs depicted subsurface conditions at the boring locations during exploration. Twenty-four test pits were dug, with a maximum depth of eight feet, and test pit logs depict subsurface conditions during exploration. Six infiltration tests were performed with field-measured infiltration rates, all of which confirmed the high to critically high shrink/swell potential for soils on the Project Site but low risk of liquefaction (**Appendix D**).

Liquefaction

Liquefaction occurs when loose, saturated, uniformly graded, fine-grained sand, and relatively cohesionless soil deposits temporarily lose strength from seismic shaking. The primary factors controlling the onset of liquefaction include intensity and duration of strong ground motion, characteristics of subsurface soil, on-site stress conditions, and the depth to groundwater. During the field investigations, only clay with variable amounts of sand and gravel was encountered, and the deposits appeared to be discontinuous and comprised of angular rock fragments mixed with sand and clayey fines. Groundwater was not encountered within these coarse-grained soil layers, so the potential for liquefaction at the site is low during seismic shaking (**Appendix D**).

WATER RESOURCES – SECTION 3.3 OF THE EA

Regulatory Setting

Federal

Executive Order 11988

Executive Order (EO) 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Specifically, EO 11988 states that agencies shall first determine whether the proposed action will occur in a floodplain. EO 11988 defines a floodplain as an area that has a one percent or greater chance of flooding in any given year. Second, if an agency proposes to allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the only practicable alternative action requires siting in a floodplain, the agency shall minimize potential harm to or within the floodplain.

Clean Water Act

CWA (33 U.S. Code [USC] § 1251-1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The U.S. Environmental Protection Agency (USEPA) is delegated as the administrative agency under the CWA. Relevant sections of the CWA are as follows.

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines. Section 303(d) requires states to identify impaired off-Reservation water bodies, rank these impaired bodies based on severity of contamination and uses for the waters, and develop water quality management strategies, usually in the form of total maximum daily loads for the contaminant(s) of concern.
- Section 401 (Water Quality Certification) requires an applicant for any federal permit that proposes an activity that may result in a discharge to Waters of the U.S., to obtain certification from the USEPA for on-trust land activities, or the state for off-Reservation activities, that the discharge will comply with other provisions of the CWA.
- Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredged or fill material) into Waters of the U.S. Each NPDES permit contains limits on concentrations of pollutants discharged to surface waters to prevent degradation of water quality and protect beneficial uses.

The Federal Antidegradation Policy was adopted as part of the 1972 amendments to the CWA. Federal policy (Code of Federal Regulations [CFR], Title 40, Part 131.12) specifies that each state must develop, adopt, and retain an anti-degradation policy to protect the minimum level of off-Reservation surface water quality necessary to support existing uses. Each state must also develop procedures to implement the anti-degradation policy through water quality management processes. Each state anti-degradation policy must include implementation methods consistent with the provisions outlined in 40 CFR § 131.12. On trust land, these issues are addressed by the USEPA.

General NPDES Permit for Construction

In 1990, an amendment to the CWA directed the NPDES permitting program to address non-point source pollution from construction activities. Construction activities include clearing, grading, excavation, stockpiling, and reconstructing existing facilities involving removal and replacement of existing foundations or other hardscapes. Construction projects disturbing one or more acres of soil must be covered under the NPDES Construction General Permit process. For tribal projects on land held in trust by the federal government, the Tribe proposing the project must apply for coverage under the USEPA's NPDES Construction General Permit. Project proponents are required to submit to the USEPA a complete Notice of Intent (NOI) to comply with the permit. A complete NOI package consists of an NOI form, site map, and fee. The USEPA's NPDES Construction General Permit also requires the development and implementation of a SWPPP. The SWPPP contains a site map showing the construction site perimeter, existing and proposed buildings, lots and roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the site. The SWPPP must list Best Management Practices (BMP) that will be implemented during construction and operation to address stormwater runoff rates and quality. SWPPP BMPs include the following categories:

- Site planning considerations, such as preservation of existing vegetation;
- Vegetation stabilization through methods such as seeding and planting;
- Physical stabilization through use of dust control and stabilization measures;
- Diversion of runoff by utilizing earth dikes and temporary drains and swales;
- Velocity reduction through measures such as slope roughening/terracing; and
- Sediment trapping/filtering through use of silt fences, straw bales and sand bag filters, and sediment traps and basins.

Safe Drinking Water Act

Under the mandate of the Safe Drinking Water Act, the USEPA sets legally enforceable National Primary Drinking Water Regulations (primary standards) that apply to public water systems. These standards are established to protect human health by limiting the levels of contaminants in drinking water. The USEPA also defines National Secondary Drinking Water Regulations (secondary standards) for contaminants that cause cosmetic and aesthetic effects, but not for health effects. The USEPA recommends that these secondary standards be met but does not require systems to comply with them.

The USEPA does not oversee the construction and permitting of groundwater wells, but requires that public health standards, such as an effectively installed sanitary seal, are in place, and recommends that water systems be installed to meet California Department of Public Health Standards. The USEPA will also primarily establish monitoring and operational requirements, which will typically be specific to the project area. Both primary and secondary drinking water standards are expressed as either Maximum Contaminant Levels, which define the highest level of a contaminant allowed in drinking water, or Maximum Contaminant Level Goals, which define the level of a contaminant below which there is no known or expected risk to health. Monitoring requirements typically include total coliform, nitrate, inorganic chemicals, volatile organic chemicals, non-volatile synthetic organic chemicals, secondary drinking water standard constituents, and general chemistry (including alkalinity, hardness, and minerals). The frequency of sampling varies and may be reduced over time.

Federal Emergency Management Agency

The Disaster Relief Act of 1974 as amended by the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 created the Federal Emergency Management Agency (FEMA), which is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers (USACE) studies. FEMA is also responsible for distributing Flood Insurance Rate Maps, which are used in the National Flood Insurance Program. These maps identify the locations of special flood hazard areas, including 100-year floodplains.

State and Local

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act provides the basis for surface water and groundwater quality regulation within California. The act established the authority of the SWRCB and the nine Regional Water Quality Control Boards (RWQCB). The act requires the State, through the SWRCB and the RWQCBs, to designate beneficial uses of surface waters and groundwater and specify water quality objectives designed to protect those uses. These water quality objectives are presented in the Regional Water Quality Control Plans. The surface water quality standards for State of California include both narrative and numerical water quality objectives to keep California's waters swimmable, fishable, drinkable, and suitable for use by industry, agriculture, and the citizens of the state.

Sustainable Groundwater Management Act

The intent of the California Sustainable Groundwater Management Act (SGMA; Water Code § 10720 et seq.) is to "enhance local management of groundwater consistent with rights to use or store groundwater… [and] to preserve the security of water rights in the state to the greatest extent possible consistent with the sustainable management of groundwater." The SGMA states that "any local agency or combination of local agencies overlying a groundwater basin may elect to be a groundwater sustainability agency for that basin" (Water Code § 10723). A groundwater sustainability agency will be formed within each groundwater basin to prepare and implement a plan for long-term groundwater sustainability.

Title 22 California Code of Regulations

Title 22 CCR Division 4, Chapter 3 regulates the sources, uses, and quality standards of recycled water in the State. Article 3, Section 60304(a) requires that any recycled water used for the irrigation of food crops, parks and playgrounds, and residential landscaping shall be a disinfected tertiary recycled water. Article 1, Section 60301.230 defines disinfected tertiary recycled water as a wastewater that has been filtered and disinfected, and which meets the following criteria:

A. The filtered wastewater has been disinfected by either: (1) A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; OR (2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.
B. The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliter (mL) using the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 mL in more than one sample in a 30-day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 mL.

City of Vallejo General Plan

The General Plan recognizes the value of water resources available to the City, including the aesthetic value, biological value, economical value, importance of municipal water services, and use of water as a means of transportation. As a guiding principle, the General Plan considers the waterfront to be a centerpiece of the community, including as natural/open space. Other Guiding Principles include environmental stewardship, including management of watersheds and wetlands and water conservation practices.

Goal NBE-5: Hazard Protection: Protect life and property from natural and human-made hazards.

> **Policy NBE-5.7** Design for Stormwater Control. Encourage new development and redevelopment to minimize the area of new roofs and paving.
>
> > **Action NBE-5.7A:** Provide informational materials that promote the use of permeable materials for driveways, streets, parking lots, sidewalks, and plazas.
> >
> > **Action NBE-5.7B:** Continue to manage and maintain City-owned storm drainage infrastructure to avoid flooding and reduce the negative effects of stormwater runoff.

City of Vallejo Municipal Code

The City's Municipal Code outlines regulations related to water use and protection. This includes regulations regarding connections to municipal water services or installation of groundwater wells, water efficient landscaping requirements, and water conservation and waste prevention requirements. The Municipal Code also outlines surface water protections, including prohibitions against illegal dumping, stormwater management actions, and zoning designations of open space areas.

Environmental Setting

Surface Water Quality

The Project Site is located in the American Canyon Creek-Frontal San Pablo Bay Estuaries watershed (HUC 180500020401) (USEPA, 2024d). The USEPA has evaluated the quality of three of these waterbodies in 2022: Carquinez Strait, Lake Chabot, and the Napa River (Mare Island Strait). The Carquinez Strait was found to be impaired due to dioxins, mercury, metals, nuisance plants or animals, polychlorinated biphenyls (PCBs), and pesticides. Lake Chabot was found to be impaired due to mercury. The Mare Island Strait portion of the Napa River is considered impaired due to mercury, PCBs, and pesticides.

Municipal Water Supply

The City of Vallejo currently utilizes surface water rights to withdraw water from three separate watersheds: the Sacramento River, Putah Creek, and Wild Horse Creek watersheds (City of Vallejo, 2021). The City also anticipates future water supplies from the Upper Suisun Creek watershed. Water sourced from the Sacramento River watershed comes from appropriative water rights license 7848, which allows for withdraw of 22,819 acre-feet (af) annually from the Sacramento River, and from a contract with the Solano County Water Agency, which provides up to 14,600 af annually. Water from the Putah Creek watershed is sourced from Lake Berryessa; available water varies annually, with a contracted allocation generally between 13,000 and 15,000 af annually. Water pulled from the Wild Horse Creek watershed is sourced from pre-1914 appropriative water rights for withdrawals from Lake Madigan (1,744 af annually), Lake Frey (1,075 af annually), and the Green Valley Diversion Dam (various annual limits, maximum 1,050 gpm rate of withdrawal). The City also holds water rights license 5728 in the Suisun Creek watershed to withdraw 5,400 af annually and anticipates utilizing this license to supply municipal water in the future.

Groundwater

The City does not use groundwater resources for municipal services. Domestic wells occurring in the vicinity of the Project Site have varying depths, with some as shallow as 100 feet and others as deep as 600 feet (CDWR, 2024). There are currently no groundwater wells on the Project Site. The geotechnical report prepared for the Project Site evaluated groundwater depth. A vertical drainage gallery was partially constructed near the bike path to the south of the Project Site. This feature was not encountered during geotechnical investigations; however, it is possible that an elevated groundwater table may be present near the bike path. Three borings were taken to determine relative groundwater depth. Two of the borings identified groundwater depths at 11 to 14 feet below ground surface. The third boring did not encounter groundwater to a final depth of 60 feet (**Appendix D**).

AIR QUALITY – SECTION 3.4 OF THE EA

Regulatory Setting

Federal

Clean Air Act of 1970

The Clean Air Act (CAA; 42 USC Chapter 85) is the federal legislation for the protection of air quality. The CAA gives the USEPA authority to regulate air quality by promulgating standards and levels for air quality and enforcing those standards and levels on federal, state, and tribal land. The CAA requires the USEPA to regulate hazardous air pollutants, which are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.

Certain air pollutants, either directly or in reaction with other pollutants, have been recognized to cause notable health problems and consequential damage to the environment due to their presence in elevated concentrations in the atmosphere. Such pollutants have been identified and regulated as part of the overall endeavor to prevent further deterioration and facilitate improvement in air quality. The Federal CAA of 1970, as amended, establishes air quality standards for several critical air pollutants (CAPs): ozone (O_3), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). These pollutants are termed “criteria” pollutants because the USEPA has established specific concentration threshold criteria based upon specific medical evidence of health effects or visibility reduction, soiling, nuisance, and other forms of damage. These National Ambient Air Quality Standards (NAAQS) are divided into primary standards and secondary standards. Primary standards are designed to protect the public health and secondary standards are intended to protect the public welfare from effects such as visibility reduction, soiling, nuisance, and other forms of damage. NAAQS and California Ambient air quality standards (CAAQS) are presented in **Table 1.**

Areas are designated attainment, nonattainment, or maintenance by the USEPA depending on whether the area is below or exceed the established NAAQS. Nonattainment areas must take steps towards attainment within a specific period of time. Once an area reaches attainment for particular criteria pollutant, then the area is re-designated attainment or maintenance. The CAA places most of the responsibility on states to achieve compliance with the NAAQS. States, municipal statistical areas, and counties that contain areas of nonattainment are required to develop a State Implementation Plan (SIP), which outlines policies and procedures designed to bring the state into compliance with the NAAQS.

Table 1: Ambient Air Quality Standards

Pollutant	Averaging Time	Standard (parts per million)		Standard (microgram per cubic meter)		Violation Criteria	
		CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS
O_3	1 hour	0.09	N/A	180	N/A	If exceeded	N/A
	8 hours	0.070	0.070	137	137	N/A	If exceeded on more than 3 days in 3 years
CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
	1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
NO_2	Annual arithmetic mean	0.030	0.053	57	100	N/A	If exceeded
	1 hour	0.18	0.100	470	188	If exceeded	N/A

Pollutant	Averaging Time	Standard (parts per million)		Standard (microgram per cubic meter)		Violation Criteria	
		CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS
SO_2	Annual arithmetic mean	N/A	0.030	N/A	N/A	N/A	If exceeded
	24 hours	0.04	0.14	105	N/A	If exceeded	If exceeded on more than 1 day per year
	1 hour (primary)	0.25	0.075	655	196	N/A	N/A
	3 hours (secondary)	N/A	0.5	N/A	N/A		If exceeded on more than 1 day per year
PM_{10}	Annual arithmetic mean	N/A	N/A	20	N/A	If exceeded	If exceeded
	24 hours	N/A	N/A	50	150	If exceeded	If exceeded on more than 1 day per year
$PM_{2.5}$	Annual arithmetic mean (primary)	N/A	N/A	12	12	If exceeded	If exceeded
	Annual arithmetic mean (secondary)	N/A	N/A	N/A	15	If exceeded	If exceeded
	24 hours	N/A	N/A	N/A	35	If exceeded	If exceeded on more than 1 day per year
Lead	30 day Avg.	N/A	N/A	1.5	N/A	If equaled or exceeded	N/A
	Rolling 3-month Avg.	N/A	N/A	N/A	0.15	N/A	If exceeded

Pollutant	Averaging Time	Standard (parts per million)		Standard (microgram per cubic meter)		Violation Criteria	
		CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS
Visibility Reducing Particles	8 hour	Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more.	No Federal Standard	N/A	No Federal Standard	N/A	N/A
Sulfates	24 hour		No Federal Standard	25	No Federal Standard	If equaled or exceeded	N/A
H_2S	1 hour	0.03	No Federal Standard	42	No Federal Standard	If equaled or exceeded	N/A
Vinyl Chloride	24 hour	0.01	No Federal Standard	26	No Federal Standard	If equaled or exceeded	N/A

Source: California Air Resources Board, 2016

Ozone

Photochemical reactions involving reactive organic gases (ROG)/volatile organic compounds (VOC) and nitrogen oxides (NO_X) resulting from the incomplete combustion of fossil fuels are the largest source of ground-level O_3. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, O_3 is primarily a summer air pollution problem. As a photochemical pollutant, O_3 is formed only during daylight hours under appropriate conditions. However, it is destroyed throughout the day and night. O_3 is considered a regional pollutant as the reactions forming it take place over time and are often most noticeable downwind from the sources of the emissions. The Bay Area Air Quality Management District is designated as nonattainment for O_3 by the USEPA (USEPA, 2024).

Particulate Matter 2.5

Particle pollution is a mixture of microscopic solids and liquid droplets suspended in air. This pollution, also known as $PM_{2.5}$, is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens (such as fragments of pollen or mold spores). The size of particles is directly linked to their potential for causing health problems. Particles smaller than 2.5 µm pose the greatest problems because they can be inhaled deep into the lungs. Exposure to such particles can affect respiratory system function. The Bay Area is designated as marginal nonattainment for $PM_{2.5}$ by the USEPA (USEPA, 2024).

Carbon Monoxide

CO is not readily dispersed throughout the atmosphere; therefore, it is considered a localized air quality issue as it is close to the emission source. CO emissions generally cause an acute (short-term) health threat. CO is a pollutant of concern at major signalized intersections (greater than 100,000 vehicles per day) that exhibit prolonged vehicle idling times. The Bay Area Air Quality Management District is designated as attainment (maintenance) for CO by the USEPA (USEPA, 2024). In July 2004, CARB adopted the 2004 CO Maintenance Plan. In 2023, CARB submitted to the USEPA a revision to the California State Implementation Plan for Carbon

Monoxide, which included an updated Maintenance Plan for three federal planning areas, titled *2023 Revision to the California State Implementation Plan for Carbon Monoxide, Updated Maintenance Plan for Three Federal Planning Areas* (CARB, 2024). The CO Maintenance Plan outlines how the region will continue to comply with the NAAQS. The BAAQMD in April 2017 adopted the multi-pollutant air quality plan *Clean Air Plan: Spare the Air, Cool the Climate*. This plan addresses ground level-zone, ozone precursor pollutants, particulate matter, toxic air contaminants, and greenhouse gases (BAAQMD, 2017b).

Hazardous Air Pollutants

In addition to the above-listed CAPs, Hazardous Air Pollutants (HAP) are a group of chemical pollutants which can cause adverse effects to human health and/or the environment. Haps are also known as toxic air pollutants or air toxics. HAPs are a list of over 188 airborne chemicals developed by the USEPA. Sources of HAPs include industrial processes, such as petroleum refining and chrome plating operations; commercial operations, such as gasoline stations and dry cleaners; cigarette smoke; and motor vehicle exhaust. Cars and trucks release at least 40 different HAPs. The most important, in terms of health risk, are diesel particulate matter (DPM), benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Health effects of HAPs can include cancer, birth defects, and neurological damage.

HAPs are less pervasive in the urban atmosphere than CAPs but are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. The majority of the estimated health risk from HAPs can be attributed to relatively few compounds. The most important HAPs are found in DPM. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. Diesel exhaust contains a variety of harmful gases and over 40 other cancer-causing substances, and the visible emissions in diesel exhaust are PM that includes carbon particles or "soot." Exposure to DPM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems.

Federal General Conformity

Under the General Conformity Rule, updated in 2010, the lead agency with respect to a federal action is required to demonstrate that the proposed federal action conforms to the applicable SIP before the action is taken. There are two phases to a demonstration of general conformity.

- The Conformity Review process, which entails an initial review of the federal action to assess whether a full conformity determination is necessary
- The Conformity Determination process, which requires that a proposed federal action be demonstrated to conform to the applicable SIP

The Conformity Review requires the lead agency to compare estimated emissions to the applicable general conformity levels (40 CFR 93.153 [b][1] and [2]), which these can be seen in **Table 2** and **Table 3**. If the emission estimates from step one is below the applicable threshold(s), then a general conformity determination is not necessary and the full Conformity Determination is not required. If emission estimates are greater than the applicable threshold(s), the lead agency must conduct a Conformity Determination.

Table 2: 40 CFR 93.153 [b][1] Emission Rates for Nonattainment Areas (NAAs)

Pollutant	Tons per Year
Ozone (VOC's or NOX):	
Serious NAA's	50
Severe NAA’s	25
Extreme NAA’s	10
Other ozone NAA’s outside ozone transport region	100
Other ozone NAA's inside an ozone transport region:	
VOC	50
NOx	100
Carbon Monoxide: all maintenance areas	100
SO_2 or NO_2: All NAAs	100
PM_{10}:	
Moderate NAA’s	100
Serious NAAs	70
PM2.5 (direct emissions, SO2, NOX, VOC, and Ammonia):	
Moderate NAA’s	100
Serious NAAs	70
PD: all NAA’s	25

Table 3: 40 CFR 93.153 [b][2] Emission Rates for Maintenance Areas

Pollutant	Tons per Year
Ozone (NOX), SO_2 or NO_2:	
All maintenance areas	100
Ozone (VOC's)	
Maintenance areas inside an ozone transport region	50
Maintenance areas outside an ozone transport region	100
Carbon monoxide: All maintenance areas	100
PM_{10}: All maintenance areas	100
$PM_{2.5}$ (direct emissions, SO_2, NOx, VOC, and Ammonia)	100
All maintenance areas	100
Pb: All maintenance areas	25

Federal Class I Areas

Title 1, Part C of the CAA was established in part to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value. The CAA designates all international parks, national wilderness areas, and memorial parks larger than 5,000 acres and national parks larger than 6,000 acres as "Class I areas." The CAA prevents significant deterioration of air quality in Class I areas under the Prevention of Significant Deterioration (PSD) Program. The PSD Program protects Class I areas by allowing only a small increment of air quality deterioration in these areas by requiring assessment of potential impacts on air quality related values of Class I areas.

Any major source of emissions within 100 kilometers (62.1 miles) from a federal Class I area is required to conduct a pre-construction review of air quality impacts on the area(s). A "major source" for the PSD Program is defined as a facility that will emit (from direct stationary sources) 250 tons per year (tpy) of regulated pollutant. For certain industries, these requirements apply to facilities that emit (through direct stationary sources) 100 tpy or more of a regulated pollutant. Mobile sources (e.g., vehicle emissions) are by definition not stationary sources and are therefore not subject to the PSD program.

Tribal New Source Review

The Tribal Minor New Source Review (NSR) permitting program was established by the USEPA under the CAA. The minor NSR program applies to both new minor sources and minor modifications to both major and minor projects in attainment and nonattainment areas. NSR programs must comply with the standards and control strategies of the Tribal Implementation Plan (TIP) or SIP. If there is not an applicable SIP or TIP, the USEPA issues permits and implements the program. A General Permit under the minor NSR program would be required on tribal trust land if stationary source allowable emissions of regulated pollutants would exceed the thresholds presented in 40 CFR 49.153, Table 1 (presented in **Table 4**). This General Permit serves as a preconstruction permit containing limitations and other restrictions specifying the construction, modification, and operation of a minor source. The applicability of Tribal NSR is made on a source's potential to emit (PTE). For emergency generators, the USEPA has determined that 500 hours per year should be assumed as a reasonable and realistic "worst-case" estimate on a PTE basis (USEPA, 1995).

Table 4: Tribal Minor New Source Review Thresholds

Pollutant	Emissions Thresholds for Nonattainment Areas (tpy)	Emissions Thresholds for Attainment Areas (tpy)
NOx	5	10
ROG	2	5
PM	5	10
PM_{10}	1	5
$PM_{2.5}$	0.6	3
CO	5	10
SO_2	5	10
Pb	0.1	0.1

Source: 40 CFR 49.153.

Climate Change

On February 19, 2021, Secretary of the Interior Deb Haaland issued Secretarial Order (SO) 3399 to prioritize action on climate change throughout the Department and to restore transparency and integrity in the Department's decision-making processes. SO 3399 specifies that when considering the impact of GHG emissions from a proposed action, Bureaus/Offices should use appropriate tools, methodologies, and resources available to quantify GHG emissions and compare GHG quantities across alternatives. SO 3399 acknowledges that identifying the interactions between climate change and the environmental impacts of a proposed action in NEPA documents can help decision makers identify opportunities to reduce GHG emissions, improve environmental outcomes, and contribute to protecting communities from the climate crisis.

On January 9, 2023, the Council on Environmental Quality issued National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (88 Fed. Reg. 1196). This interim guidance directs agencies to consider the potential effects of a proposed action on climate change and the effects of climate change on a proposed action and its environmental impacts. CEQ recommends that agencies quantify a proposed action's projected GHG emissions for the expected lifetime of the action and provide additional context for GHG emissions, including the use of the best available social cost of GHG (SC–GHG) estimates, to translate climate impacts into the more accessible metric of dollars. This guidance does not propose a specific, quantitative threshold of significance; however, it states that agencies should consider the potential for mitigation measures to reduce or mitigate GHG emissions and climate change effects when those measures are reasonable and consistent with achieving the purpose and need for the proposed action. CEQ recommends that agencies explain how the proposed action and alternatives would help meet or detract from achieving relevant climate action goals and commitments, including federal goals, international agreements, state or regional goals, Tribal goals, agency-specific goals, or others as appropriate.

State and Local

California Air Resources Board

The California Air Resources Board (CARB), a part of the California Environmental Protection Agency (Cal/EPA), is responsible for the coordination and administration of both federal and State air pollution control programs within California. In this capacity, CARB conducts research, sets the CAAQS, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California as well as consumer products (e.g., hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB also has primary responsibility for the development of California's SIP, for which it works closely with the Air Quality Management District's and the USEPA.

California Clean Air Act and Regional Air Quality Standards

Air Quality

The California Clean Air Act of 1988 requires nonattainment areas to achieve and maintain the CAAQS by the earliest practicable date, as well as requires local air districts to develop plans for attaining the State O_3, CO, SO_2, and NOx standards.

At a local level, the Bay Area Air Quality Management District (BAAQMD) has jurisdiction over the southwestern portion of Solano County. The BAAQMD attains and maintains air quality conditions in Solano County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BAAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption, and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution.

Odor

Odors can be produced by many substances in the environment, such as animals, human activities, industry processes, natural decomposition of materials, and vehicles. In general, the USEPA does not have regulations for odors per se but does control 188 toxic air pollutants. Sulfur dioxide SO_2 is the only regulated air pollutant that possesses a strong odor (Agency for Toxic Substances and Disease Registry, 2015).

Human related sources that could produce odors include waste processing and heavy industrial facilities such as WWTPs, landfills and composting facilities, chemical manufacturing facilities, and confined animal facilities (e.g., dairies). A potential natural occurring odor during wildfire season is smoke from wildfires. Odor would be noticeable if in close proximity to the Project Site, such as within two miles.

Because offensive odors rarely cause any physical harm and no requirements for their control are included in state or federal air quality regulations, local air districts often have no numerical rules or standards related to odor emissions, other than regulations related to nuisances. The BAAQMD 2017 *California Environmental Quality Act Air Quality Guidelines*, specifically Table 3-3 in the document, outlines the distances used to screen odors for certain land uses, but screening criteria is recommended for informational purposes in conjunctions with other assessment tools, such as odor parameters and complaint history (BAAQMD, 2017).

Global Climate Change

California has been a leader among states in outlining and aggressively implementing a comprehensive climate change strategy that is designed to result in a substantial reduction in total statewide GHG emissions in the future. California's climate change strategy is multifaceted and involves a number of State agencies implementing a variety of State laws and policies. These California laws and policies are summarized below in addition to the local air district's guidelines for determining a project's impacts on climate change.

State

Executive Order S-3-05

EO S-3-05 established the following statewide emission reduction targets:

- Reduce GHG emissions to 2000 levels by 2010.
- Reduce GHG emissions to 1990 levels by 2020.
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

EO S-3-05 created a Climate Action Team (CAT) headed by the Cal/EPA and including several other State jurisdictional agencies. The CAT is tasked by EO S-3-05 with outlining the effects of climate change on California and recommending an adaptation plan. The CAT is also tasked with creating a strategy to meet the target emission reductions. In April 2006, the CAT published an initial report that accomplished these two tasks.

California Global Warming Solutions Act of 2006 (Assembly Bill 32)

Assembly Bill (AB) 32 codifies a key requirement of EO S-3-05: the requirement to reduce State-wide GHG emissions to 1990 levels by 2020. AB 32 tasks CARB with monitoring State sources of GHGs and designing emission reduction measures to comply with the law's emission reduction requirements. However, AB 32 also continues the CAT's efforts to meet the requirements of EO S-3-05 and states that the CAT should coordinate overall state climate policy.

In order to accelerate the implementation of emission reduction strategies, AB 32 requires that CARB identify a list of discrete early action measures that can be implemented relatively quickly. In October 2007, CARB published a list of early action measures that could be implemented and would serve to meet about a quarter of the required 2020 emissions reductions. In order to assist CARB in identifying early action measures, the CAT published a report in April 2007 that updated their 2006 report and identified strategies for reducing GHG emissions. In the October 2007 report, CARB cited the CAT strategies and other existing strategies that may be utilized in achieving the remainder of the emissions reductions.

AB 32 required that CARB prepare a comprehensive “scoping plan” that identifies all strategies necessary to fully achieve the required 2020 emissions reductions. CARB provided its first update to the Climate Change Scoping Plan in May 2014. The purpose of the update was to identify the next steps for California’s leadership on climate change. The updated Plan outlined the progress California has made to date regarding near-term 2020 GHG limits, such as cleaner and more efficient energy, cleaner transportation, and CARB’s Cap-and-Trade Program. The updated Plan identifies six key areas where further control strategies are needed: energy, transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), agriculture, water, waste management, and natural and working lands. In 2016, the Legislature passed Senate Bill (SB) 32. This established a benchmark for California to reduce GHG emissions to 40 percent below 1990 levels by 2030. In December 2017, CARB adopted the 2017 Climate Change Scoping Plan, which provides a framework for achieving the 2030 target. The plan emphasizes the importance of transitioning to renewable energy sources, enhancing energy efficiency, promoting zero-emission vehicles, and strengthening carbon sequestration efforts on natural and working lands. The scoping plan also highlights the role of the Cap-and-Trade Program in driving emissions reductions across multiple sectors of the economy.

The most recent update is the 2022 Scoping Plan, which outlines a path to achieve carbon neutrality by 2045 and reduce anthropogenic GHG emissions by 85% below 1990 levels. The 2022 Scoping Plan focuses on significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reducing short-lived climate pollutants, supporting sustainable development, increasing action on natural and working lands to reduce emissions and sequester carbon, and capturing and storing carbon.

Executive Order S-01-07

EO S-01-07 mandates a State-wide goal to reduce the carbon intensity of transportation fuels by at least 10 percent by 2020. This target reduction was identified by CARB as one of the AB 32 early action measures identified in their October 2007 report.

Executive Order B-30-15

EO B-30-15 sets interim GHG targets of 40 percent below 1990 by 2030, to ensure California will meet the 2050 targets set by AB 32.

EO N-79-20/ Advanced Clean Cars II

Advanced Clean Cars II accelerates requirements that automakers deliver an increasing number of zero-emission light-duty vehicles each year (beginning with 2026 models) and codifies EO N-79-20. The regulation applies to automakers (not dealers) and covers only new vehicle sales. It does not impact existing vehicles on the road, which will still be legal to own and drive. Sales of new zero-emission vehicles and plug-in hybrids will start with 35% in 2026, build to 68% in 2030, and reach 100% in 2035. In other words, 100% of new cars and light trucks sold in California will be zero-emission vehicles, including plug-in hybrid electric vehicles, by 2035.

Senate Bill 350

SB 350 codifies the GHG targets for 2030 set by EO B-30-15. To meet these goals, SB 350 also raises the Renewables Portfolio Standards from 33 percent renewable generation by 2020 to 50 percent renewable generation by December 31, 2030.

Senate Bill 375

SB 375 provides for the creation of a new regional planning document called a sustainable communities strategy (SCS). An SCS is a blueprint for regional transportation infrastructure and development that is designed to reduce GHG emission from cars and light trucks to target levels that will be set by CARB for 18 regions throughout California. Each of the various metropolitan planning organizations must prepare an SCS and include it in that region's regional transportation plan. The SCS can influence transportation, housing, and land use planning. CARB will determine whether the SCS will achieve the region's GHG emissions reduction goals. Under SB 375, certain qualifying in-fill residential and mixed-use projects would be eligible for streamlined California Environmental Quality Act (CEQA) review.

AB 1279 (California Climate Crisis Act)

AB 1279 declares the policy of the State to achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045. By 2045, statewide anthropogenic greenhouse gas emissions should be reduced to at least 85% below the 1990 levels, and thereafter, the State aims to achieve and maintain net negative greenhouse gas emissions. AB 1279 requires the State Board to work with relevant State agencies to ensure that updates to the scoping plan identify and recommend measures to achieve these policy goals and to identify and implement a variety of policies and strategies that enable carbon dioxide removal solutions and carbon capture, utilization, and storage technologies in California. AB 1279 also requires the State Board to submit an annual report.

Bay Area Air Quality Management Basin

BAAQMD publishes thresholds of significance for evaluating the significance of climate impacts from land use projects and plans. Its most recent guidelines for climate can be found in its 2022 Justification Report. The thresholds described within the report evaluate significance based a project's effect on California's efforts to meet the State's long-term climate goal rather than setting emission standards. **Table 5** shows the criterium the project must meet during operation in order to be considered to have a less than significant impact on climate change. No standards are set for construction of a project because of their small one-time contribution to climate change (BAAQMD, 2022).

Climate Change and Its Potential Impacts

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. GHGs include all of the following compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (Health & Safety Code § 38505[g]). In addition to natural sources, human activities are exerting a substantial and growing influence on climate by changing the composition of the atmosphere and the ocean, and by modifying the land surface through deforestation and urbanization that reduces carbon capture and decreases albedo (Intergovernmental Panel on Climate Change [IPCC], 2014). In particular, increased consumption of fossil fuels has substantially increased atmospheric levels of GHGs. Emissions of these gases are attributable to human activities associated with the industrial/manufacturing, utilities, transportation, residential, commercial, and agricultural sectors (CARB, 2023).

In 2021, transportation generated 39% of California's GHG emissions. This was followed by the industrial sector (22%), electricity generation in state (11%), residential (8%), agriculture and forestry (8%), commercial (6%), and electricity imports (5%) (CARB, 2023). Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion, among other sources. CH_4 results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2 include uptake by vegetation and dissolution into the ocean.

Table 5: BAAQMD's Climate Change Thresholds for Land Use Projects*

A	1. Buildings a. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development). b. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines.
	2. Transportation a. Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA: i. Residential projects: 15 percent below the existing VMT per capita ii. Office projects: 15 percent below the existing VMT per employee iii. Retail projects: no net increase in existing VMT b. Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.
B	Projects must be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).

Source: BAAQMD, 2022
* A project must meet either criterium A or B to be considered to have a less than significant impact.

In 2008, the City of Vallejo developed a community-wide baseline GHG emission inventory to identify the major sources of GHG emissions within the City and establish a baseline for measuring future progress. The primary sources of GHG emissions were transportation (47%), residential (29%), commercial/industrial (19%), waste (2%), water (1%), and off-road (1%). The City emitted approximately 588,040 metric tons of carbon dioxide equivalent (MT CO_2e) in 2008 (City of Vallejo, 2012). Climate change has the potential to impact the natural and economic environment of both the City and the BAAQMD.

According to the United Nations IPCC and the USEPA, it is very likely (greater than 95% probability) that human activity is responsible for rising temperatures. The IPCC expects global temperatures to increase another 2 to 10 degrees Fahrenheit by 2100, depending on how much atmospheric GHG concentrations continue to rise.

Climate change has the potential to impact California and the Bay Area natural and economic environment. The following is an abbreviated list of potential climate change impacts.

- Rising sea levels along the California coastline, particularly in San Francisco and the Sacramento-San Joaquin River Delta due to ocean expansion.
- Extreme heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent.

- An increase in heat-related human deaths and infectious diseases and a higher risk of respiratory problems caused by deteriorating air quality.
- Reduced snow pack and stream flow in the Sierra Nevada mountains, affecting winter recreation and water supplies.
- Potential increase in the severity of winter storms, affecting peak stream flows and flooding.
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield.
- Changes in distribution of plant and wildlife species due to changes in temperature, competition of colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

Social Cost of Carbon

The Interagency Working Group on Social Cost of Greenhouse Gases (IWG) has developed estimates of the social cost of GHGs (SC-GHG) (IWG, 2021). The SC-GHG is the monetary value of the net harm to society associated with adding an amount of that GHG to the atmosphere in a given year. In principle, it includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services. Discount rates are used to account for the present value of future costs. Using a low discount rate increases the present value of future costs, whereas using a high discount rate decreases the present value of future costs. The IWG cost estimates are provided for 2.5, 3 and 5 percent discount rates.

Environmental Setting

Regional Meteorology

During summer and fall months, high pressure offshore, coupled with thermal low pressure in the Central Valley, draws marine air eastward through the Carquinez Strait almost daily. Temperatures along the coast and inland tend to remain moderate. Winter temperatures range from cool overnight to moderate during the day, while summer temperatures range from moderate overnight to warm during the day. Afternoon westerly winds are common in the southern portion of the county, along the Carquinez Strait. Annual rainfall totals range from 13 inches near the coast to 22 inches inland in Fairfield (BAAQMD, 2017).

BIOLOGICAL RESOURCES – SECTION 3.5 OF THE EA

Regulatory Setting

Federal

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) protects species that are at risk of extinction and provides for the conservation of the ecosystems on which they depend. The U.S. Fish & Wildlife Service (USFWS) and the National Oceanic and Atmosphere Administration, Fisheries Service (NOAA Fisheries) share responsibility for implementing FESA. Generally, USFWS manages terrestrial and freshwater species, while NOAA Fisheries is responsible for marine and anadromous species. Section 9 (§ 1538) prohibits the "take" of a listed species by anyone, including private individuals and state and local agencies. Threatened and endangered species on the federal list (50 CFR Sections 17.11 and 17.12) are protected from take, which is defined as direct or indirect harm. If "take" of a listed species is incidental to an otherwise lawful activity, this triggers the need for consultation under Section 7 of the FESA for federal agencies.

Pursuant to the requirements of the FESA, a federal agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present on a proposed project site and whether a proposed project will have a potentially significant impact upon such species. Under the FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether a project is likely to jeopardize the continued existence of any species that is proposed for listing under the FESA or to result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC Section 1536[3], [4]).

Magnuson-Stevens Act and Sustainable Fisheries Act

The Magnuson–Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) is the primary law that governs marine fisheries management in U.S. federal waters. First passed in 1976, the Magnuson-Stevens Act fosters the long-term biological and economic sustainability of marine fisheries. Its objectives include: preventing overfishing; rebuilding overfished stocks; increasing long-term economic and social benefits; ensuring a safe and sustainable supply of seafood; and protecting habitat that fish need to spawn, breed, feed, and grow to maturity. The Sustainable Fisheries Act of 1996 (Public Law 104-297) amended the Magnuson-Stevens Act to establish new requirements for fishery management councils to identify and describe Essential Fish Habitat (EFH) and to protect, conserve, and enhance EFH for the benefit of fisheries. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The Sustainable Fisheries Act also established a federal EFH consultation process that advises federal agencies to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH. Consultation is required if a federal agency has authorized, funded, or undertaken part or all of a proposed activity and the action will adversely affect EFH. An adverse effect includes direct or indirect physical, chemical, or biological alternations to waters or substrate, species and their habitat, quality and/or quantity of EFH, or other ecosystem components. If a federal agency determines that an action will not adversely affect EFH, and NOAA Fisheries agrees, no consultation is required. Fishery management councils can designate Habitat Areas of Particular Concern, specific areas within EFH that have extremely important ecological functions and/or are especially vulnerable to degradation.

Migratory Bird Treaty Act

Migratory birds are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. As such, project-related disturbances must be reduced or eliminated during the nesting season. The general nesting season extends from February 15 to September 15.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act was originally enacted in 1940 to protect bald eagles and was later amended to include golden eagles (16 USC Subsection 668-668). This act prohibits take, possession, and commerce of bald and golden eagles and associated parts, feathers, nests, or eggs with limited exceptions. The definition of take is the same as the definition under the FESA. The USFWS established five recovery programs in the mid-1970s based on geographical distribution of the species, which California located in the Pacific Recovery Region. Habitat conservation efforts in the Pacific Recovery Region, including laws and management practices at federal, state, and community levels, have helped facilitate bald eagle population increases. Critical habitat for bald and golden eagles was not designated as part of the Pacific Recovery Plan created under FESA. Likewise, critical habitat was not designated by regulation under FESA. In 1995, the USFWS reclassified the bald eagle from endangered to threatened under FESA in the contiguous 48 states, excluding Michigan, Minnesota, Wisconsin, Oregon, and Washington where it had already been listed as threatened. In 2007, the bald eagle was federally delisted under FESA. However, the provisions of the act remain in place for protection of bald and golden eagles.

Clean Water Act - Sections 404 and 401

Any project that involves discharge of dredged or fill material into jurisdictional Waters of the U.S. must first obtain authorization from the USACE, under Section 404 of the CWA. Projects requiring a 404 permit under the CWA also require a Section 401 certification from either the USEPA for trust land, or the RWQCB for non-trust land. These two agencies also administer the NPDES general permits for construction activities disturbing one acre or more.

Effective September 8, 2023, the USEPA and the USACE have issued a new final rule in the Code of Federal Regulations to conform the definition of 'waters of the United States' to the 2023 Supreme Court's May 25, 2023 decision in Sackett vs. EPA. Under the new final rule, tributaries and wetlands must have a continuous surface connection to navigable waterways to be considered jurisdictional under the Clean Water Act. Only those relatively permanent, standing, or continuously flowing bodies of water meet the current definition.

In certain states where litigation regarding this definition is ongoing, the pre-2015 definition of waters of the U.S. is in effect. California is not one of these states and currently operates under the definition as promulgated under the new final rule.

State and Local

California Endangered Species Act

The California Endangered Species Act (CESA) declares that deserving plant or animal species will be given protection by the state because they are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. The CESA established that it is State policy to conserve, protect, restore, and enhance state-listed species and their habitats. Under State law, plant and animal species may be formally listed by the California Fish and Game Commission.

The CESA authorizes that private entities may take listed species under FESA and CESA, pursuant to a federal incidental take permit issued in accordance with Section 10 of the FESA, if the California Department of Fish and Wildlife (CDFW) certifies that the incidental take statement or incidental take permit is consistent with the CESA (California Fish & Game Code § 2080.1[a]).

California Fish and Game Code

The California Fish and Game Code defines "take" (Section 86) and prohibits take of a species listed under the CESA (California Fish and Game Code § 2080), or otherwise special-status (California Fish and Game Code §§ 3511, 4700, and 5050). Section 2081(b) and (c) of the CESA allows CDFW to issue an incidental take permit for a State-listed species if specific criteria outlined in Title 14 CCR §§ 783.4(a), (b) and CDFW Code § 2081(b) are met. The CDFW Code § 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by the code. Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the taxonomic order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the MBTA or any part of such migratory non-game bird except as provided by rules and regulations adopted by the U.S. Secretary of the Interior under provisions of the MBTA. If a project is planned in an area where a species or specified bird occurs, an applicant must design the project to avoid all take; the CDFW cannot provide take authorization under the CESA.

Native Plant Protection Act of 1977

Native Plant Protection Act of 1977 and implementing regulations in Section 1900 et seq. of the California Fish and Game Code designate special-status plant species and provide specific protection measures for identified populations. The CDFW administers the Native Plant Protection Act.

City of Vallejo General Plan

The City of Vallejo General Plan is the master policy document that provides the general framework for all zoning and land use decisions within a community. The Nature and Built Environment Element includes the City's objectives and policies regarding biological resources, including natural resources, scenic resources, open space, and urban greening. This section of the General Plan identifies three main goals; Beautiful City; Innovation, Entrepreneurship, and successful Local Business; and Sustainable Economic Development.

City of Vallejo Municipal Code

The City of Vallejo Municipal Code identifies zoning designations for parcels that fall within the City as well as allowable uses for such parcels, including ensuring compatible land use zoning for open space areas and adjacent lands. Additionally, the Municipal Code sets forth stormwater treatment and discharge standards protective of water quality. Finally, the Municipal Code identifies tree removal requirements and sets forth requirements for obtaining an inventory of trees to be removed and tree replacement requirements.

Solano Multispecies Habitat Conservation Plan

The Project Site is located within the plan area of the draft Solano Multispecies Habitat Conservation Plan (SMHCP). The City of Vallejo is a plan participant, and the full geographical extent of the City falls within the plan area, which indicates that the Project Site is part of the plan area. The SMHCP is currently in administrative draft form, and a final plan has not yet been adopted. The purpose of the plan is to provide a programmatic analysis of development impacts within the plan area and to provide a streamlined permitting process. Covered species include California red-legged frog, Callippe silverspot butterfly, northwestern pond turtle, and salt marsh harvest mouse.

Environmental Setting

Habitat Types

Habitats that occur within the Project Site consist of ruderal/developed, riparian scrub, freshwater marsh, pasture, and annual grassland/rock outcrop. These habitats are shown on **Figure 3.5-1** of the EA. Acreages of habitat within the Project Site are included below. Representative site photographs are provided in Attachment B of **Appendix H-1**, and a list of plant and animal species observed during the 2024 site visits and previous site visits is included as Attachment C of **Appendix H-1**.

Ruderal/Developed (7.4 acres)

Ruderal/developed habitats are those areas that are highly modified from their natural state and are subject to intensive land management, paving, or similar. Within the Project Site, ruderal developed areas included an unpaved access drive and informal parking areas, fencing, and horse shelters. Vegetation was sparse to absent in this area. Where vegetation did occur, it was dominated primarily by non-native grasses and invasive forbs.

Riparian Scrub (0.4 acre)

This community is found on the western edge of the Project Site; it is associated with an intermittent drainage that is fed by both the flank of Sulphur Springs Mountain as well as road runoff from I-80. The vegetation is dominated by arroyo willow (*Salix lasiolepis*) with an understory of Himalayan blackberry (*Rubus discolor*) and poison oak (*Toxicodendron diversilobum*), and limited areas of broad-leaved cattail (*Typha latifolia*). Vegetation along the edge of the riparian habitat included sweet fennel (*Foeniculum vulgare*) and coyote brush (*Baccharis pilularis*). The riparian habitat transitions to either marsh or pasture, depending upon the local topography. This feature is associated with an intermittent channel.

Freshwater Marsh (3.4 acres)

Freshwater marsh habitat was observed in the valleys of hills. The dominant plants in these areas are rushes (e.g. *Juncus bufonius*) and spikerushes (*Eleocharis*). Facultative grasses and forbs are also present, such as perennial ryegrass (*Lolium perenne*), Bermuda grass (*Cynodon dactylon*), curly dock (*Rumex crispus*), common monkeyflower (*Mimulus guttattus*), and pennyroyal (*Mentha* sp.). Ponded areas contain floating plants such as watercress (*Nasturtium officinale*). The water quality of these marshes has been impacted by cattle, which are allowed to wallow and graze in the wetlands.

Pasture (114.6 acres)

The majority of the Project Site is a simplified non-native grassland containing perennial ryegrass (*Lolium perenne*), wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), and other pasture grasses. These areas are subject to significant grazing pressure and may have been plowed or conditioned previously. Non-native forbs are abundant, such as thistles (*Silybum*, *Carduus*), filarees (*Erodium*), star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echioides*), poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), and spiny cocklebur (*Xanthium spinosum*). Large patches of artichoke thistle (*Cynara cardunculus*) were also observed within this habitat.

Annual Grassland/Rock Outcrop (30.6 acres)

This non-native annual grassland community is similar to the pasture community described above, but contains a greater diversity of species and greater number of native species. This is due in part to the rocky terrain, which is more difficult for cattle to graze, and because the metamorphic soils and rock outcrops provide additional habitat niches. Native wildflowers were abundant, such as California poppy (*Eschscholzia californica*), golden violet (*Viola pedunculata*), owl's clover (*Castilleja*), and blue dicks (*Dichelostemma capitatum*). Seeps were common at the base of rock outcrops, and these wet areas created microhabitats for specialized plants, such as ferns and succulents (*Dudleya* spp.).

Oak Woodland (3.6 acres)

A narrow strip of oak woodland occurs along the northern boundary of the Project Site along a hilltop crest. This habitat contains a significant canopy cover of coast live oak (*Quercus agrifolia*). Ground cover vegetation is similar to species observed within the annual grassland/rock outcrop habitat.

Special-Status Species

For the purposes of this assessment, "federally listed species" has been defined to include those species that are listed as Endangered or Threatened under FESA or formally proposed candidates for listing. For the purposes of this assessment, "State-listed species" has been defined to include: 1) species listed as Threatened or Endangered under CESA or proposed candidates for listing; 2) Fully Protected species, as designated by the CDFW; and 3) plant species meeting the definition of 'Rare' or 'Endangered' under California Environmental Quality Act Guidelines 14 CCR § 15125 (c) and/or 14 CCR § 15380, including plants listed on CNPS Lists 1A (presumed extinct in California), 1B (rare, threatened, or endangered in California and elsewhere), 2A (presumed extirpated in California, but more common elsewhere), and 2B (rare, threatened, or endangered in California, but more common elsewhere).

CULTURAL AND PALEONTOLOGICAL RESOURCES – SECTION 3.6 OF THE EA

Regulatory Setting

Federal

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations found in 36 CFR Part 800 require federal agencies to identify cultural resources that may be affected by actions involving federal lands, funds, or permitting. The BIA must comply with Section 106 for the proposed trust acquisition. The significance of the resources must be evaluated using established criteria outlined in 36 CFR 60.4, as described below.

If a resource is determined to be a historic property, Section 106 of the NHPA requires that effects of the federal undertaking on the resource be determined. A historic property is defined as:

> *…any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and material remains related to such a property… (NHPA Sec. 301[5])*

Section 106 of the NHPA prescribes specific criteria for determining whether a project would adversely affect a historic property, as defined in 36 CFR 800.5. An impact is considered adverse when prehistoric or historic archaeological sites, structures, or objects that are listed on or eligible for listing in the National Register of Historic Places (NRHP) are subjected to the following:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property that causes its deterioration; and

- Transfer, lease, or sale of the property out of federal control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

If the historic property will be adversely affected by the undertaking, then prudent and feasible measures to resolve adverse impacts must be taken. The State Historic Preservation Office must be provided an opportunity to review and comment on these measures prior to project implementation.

National Register of Historic Places

The eligibility of a resource for listing in the NRHP is determined by evaluating the resource using criteria defined in 36 CFR § 60.4 as follows.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, association, and:

A) That are associated with events that have made a significant contribution to the broad patterns of our history;
B) That are associated with the lives of persons significant in our past;
C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D) That have yielded, or may be likely to yield, information important to prehistory or history.

Sites younger than 50 years, unless of exceptional importance, are not eligible for listing in the NRHP.

In addition to meeting at least one of the criteria listed above, the property must also retain enough integrity to enable it to convey its historic significance. The NRHP recognizes seven aspects or qualities that, in various combinations, define integrity. These seven elements of integrity are location, design, setting, materials, workmanship, feeling, and association. To retain integrity a property will always possess several, and usually most, of these aspects.

While most historic buildings and many historic archaeological properties are significant because of their association with important events, people, or styles (Criteria A, B, and C), the significance of most prehistoric and some historic-period archaeological properties is usually assessed under Criterion D. Criterion D stresses the importance of the information contained in an archaeological site rather than its intrinsic value as a surviving example of a type or its historical association with an important person or event. It places importance not on physical appearance but rather on information potential.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA), 25 USC 3001 et seq*.*, provides a process for museums and federal agencies to return Native American cultural items – human remains, funerary objects, sacred objects, or objects of cultural patrimony – to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on federal and Tribal lands, and penalties for noncompliance and illegal trafficking.

Archaeological Resources Protection Act of 1979

The Archaeological Resources Protection Act of 1979 (ARPA; Public Law 96-95; 16 USC 470aa-mm) provides for the protection of archaeological resources and sites that are on public and Indian lands, and fosters increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data that were obtained before October 31, 1979. ARPA also provides for penalties for noncompliance and illegal trafficking.

Paleontological Resources Preservation Act

Paleontological resources are defined as the traces or remains of prehistoric plants and animals. Such remains often appear as fossilized or petrified skeletal matter, imprints, or endocasts, and reside in sedimentary rock layers. Paleontological resources are considered important for their scientific and educational value. Fossil remains of vertebrates are considered significant. Invertebrate fossils are considered significant if they function as index fossils. Index fossils are those that appear in the fossil record for a relatively short and known period of time. This allows geologists to interpret the age range of the geological formations in which they are found.

The Paleontological Resources Preservation subtitle of the Omnibus Public Land Management Act, 16 USC 470aaa to aaa-11 requires the U.S. Department of Agriculture (USDA) and the U.S. Department of the Interior to issue implementation regulations to provide for the preservation, management, and protection of paleontological resources on federal lands and ensure that these resources are available for current and future generations to enjoy as part of America's national heritage.

Environmental Setting

Prehistoric Overview

Present-day researchers identify four periods and associated patterns in the San Francisco Bay area (see **Table 6**). Archaeological evidence is rare for occupation in the San Francisco Bay Area dating earlier than 6,000 years ago during the Early Holocene. The Early Period saw the emergence of new technologies (e.g., mortars and pestles and shell beads) that reflect increases in sedentism, mortuary complexity, and regional trade. The Middle Period represents a continuation and expansion of the Early Period. The period exhibits the use of a rich and varied diet that included acorns, fish, shellfish, and large and small mammals. The Late Period is characterized by an increase in population and the number of settlements, the appearance of status differentiation, and the appearance of shell beads as a form of currency.

Table 6: Archeological Time Periods and Patterns in the North Bay Area

Temporal Period	Cultural Pattern	Timeframe*
Early Holocene (Lower Archaic)	Borax Lake Pattern	8000–3500 cal B.C.
Early Period (Middle Archaic)	Mendocino Pattern	3500–500 cal B.C.
Middle Period (Upper Archaic)	Berkeley Pattern	500 cal B.C.–cal A.D. 1000
Late Period (Emergent)	Augustine Pattern	cal A.D. 1000 to Historic Contact

* The raw radiocarbon dates have been calibrated (cal) to provide calendar dates.

Ethnographic Overview

Prior to the arrival of Euroamericans in the Bay area, California was inhabited by groups of Native Americans speaking more than 100 different languages and occupying a variety of ecological settings (Kroeber, 1925). The project area is within the ethnographic territory of the Southern Wintun or Patwin (Johnson, 1978). Patwin are members of the widespread Penutian language family, which was prevalent throughout California during the late prehistoric and historic era (e.g., A.D. 1800). There are several sources on the Patwin. This brief ethnographic overview is primarily based on research presented by Cook (1976) and Johnson (1978).

Patwin were organized into tribelets, which were usually composed of a principal village and a few satellite settlements. Tribelets were small, autonomous, and sometimes bounded by the limits of a small drainage. Each tribelet had a head chief and each village had a chief who administered its economic and ceremonial activities. The position of chief was usually inherited through the male line, but village elders occasionally chose some chiefs. The chief possessed political, ceremonial, and economic powers and enjoyed high prestige. Patwin subsistence relied on hunting, fishing, and gathering a wide variety of plant resources that were located within their territory. Acorns were a major part of their diet, and were obtained from hill and mountain oaks communally owned by the tribelet.

The influx of European and Spanish explorers and settlers during the 1830s and 1840s rapidly changed Patwin demography. The discovery of gold at Sutter's Mill in Coloma in 1848, however, was the catalyst that caused a dramatic alteration of both Native American and Euroamerican cultural patterns in California. Initially, the Euroamerican population grew slowly, but soon exploded as the presence of large deposits of gold was confirmed in the Sacramento area. The population of California quickly swelled from an estimated 4,000 Euroamericans in 1848 to 500,000 in 1850. The large influx of Euroamerican immigrants had a positive effect on growth and economic development in California, but a negative effect on Native American cultures. Indeed, the discovery of gold in California marked the beginning of a relatively rapid decline of both Native American populations and culture.

The Project Site is in traditional Patwin territory, but the Scotts Valley Band of Pomo Indians (SVBPI) have traditional and historic ties to Vallejo and the surrounding area (Theodoratus 2016 and Hurtudo and Theodaratus 2016). SVBPI "traditional territory" was located on the western side of Clear Lake, however, beginning in the early 1800s they were incorporated into the Mexican colonial system of missions and rancherias and many individuals and families were relocated to areas near the project site (Hurtado and Theodoratus, 2016). In 1911 the SVBPI was provided with a 56.88-acre parcel of land for a Rancheria, but the land was determined unsuitable for subsistence and was terminated (1965) with deeds given to individual residents called distributees (Theodoratus, 2016). After termination many of the former residents were once again relocated to the Bay Area near the project site under the Indian Relocation Act of 1956 (P.L. 959).

Historical Overview

Early European exploration near the Subject Parcel included expeditions by Gabriel Moraga in 1810 and Fathers José Altimira and Alferez José Sánchez in 1823, seeking mission sites. These explorations grew more violent as they pursued and captured indigenous people who had escaped coastal missions. By 1820, many southern Patwin-speaking groups, such as the Suisuns, Tolenas, and Malacas, were incorporated into the mission system, particularly Mission San Francisco. In 1821, Mexico gained independence and declared California part of its empire, marking the beginning of the Mexican Period. The missions were secularized in 1833 and lands were divided among the Californios. The grants, known as ranchos, enriched their recipients while subjugating native tribes as laborers. The Rancho Soscol grant, which included the project site, was given to General Vallejo in

1843, and he used the property for grazing cattle and horses However, after the Mexican-American War, land grant claims had to be defended in American courts, and Vallejo's Soscol grant was not upheld (**Appendix H-1**).

Paleontological Resources

Paleontological resources are the fossilized remains of plants and animals, including vertebrates, invertebrates, and fossils of microscopic plants and animals (microfossils). The age and abundance of fossils depends on the location, topographic setting, and particular geologic formation in which they are found. The subject parcel is located on the western edge of the Sulphur Springs Mountain. Topography includes a steep knoll to the south, a level area in the south-central portion of the site, and steeply rising landforms to the north, dotted with trees, ephemeral drainages, and rock outcrops. Surface soils consist primarily of well-drained Toomes very stony loam and Dibble clay loam, as well as poorly drained Clear Lake clay (**Appendix H-1**). The University of California Museum of Paleontology Database was accessed and reviewed for any paleontological resources within the same setting as the Project Site. According to the database, 226 paleontological resources have been identified within Solano County (UCMP, 2024).

Cultural Resource Investigations

Multiple cultural resources investigations have been conducted within the Project Site, including archival research at the Northwest Information Center, Sonoma State University, Native American contact, and field inspections. A detailed description of prior survey methodologies are provided in **Appendix I-1 and I-2**, and are summarized briefly below.

Native American Contact

The California Native American Heritage Commission (NAHC) conducted a review of the Sacred Lands File in March 2024, which did not identify any sites. In addition, a list of recommended Native American contacts was provided (**Appendix I-3**). AES-Montrose spoke with Tribal Monitor Jesse Gonzalez on September 15, 2022. Mr. Gonzalez mentioned a known chert quarry but was unaware of any other cultural resources within the Project Site. Letters were also sent to the following groups informing them of the study and requesting any known information relative to tribal cultural resources within the Project Site: Cachil Dehe Band of Wintun Indians of the Colusa Indian Community, Cortina Rancheria-Kletsel Dehe Band of Wintun Indians, Confederated Villages of Lisjan, United Auburn Indian Community of the Auburn Rancheria, Yocha Dehe Wintun Nation, and Guidiville Rancheria of California. A contractor engaged by the Yocha Dehe Nation responded indicating that Yocha Dehe Nation has expressed concerns about any future development activity on the Project Site and requested information regarding the project and status of the environmental review. No other responses have been received.

Records and Literature Search, 129-acre APN 182-010-010

A review of all recorded historic resources and resource inventory reports was conducted at the Northwest Information Center of the California Historical Resources Inventory System, on December 22, 2015, and September 2, 2022. Results showed that five previous surveys had been conducted, including all but the very northern edge of the parcel, and one cultural resource had been previously recorded within APN 182-010-010. CA-SOL-275, identified in 1980, includes a prehistoric Franciscan chert quarry and a historic serpentine quarry with artifacts indicating use from around 1900-1930. Records searches within a ½ mile radius of the Project Site revealed one formal resource and five informal resources (**Appendix I-1**).

Historical aerial images and topographic maps were examined to understand past land uses on APN 182-010-010and its surroundings. The 1937 image reveals I-80, Columbus Parkway, agricultural areas, and residences nearby. Evidence of drainage or roads, along with small agricultural areas, is seen. The 1947 image suggests a potential mining/quarry area. Mowing is evident by 1958, with residential development starting in 1963. Electrical transmission towers and a water tank are observed in later images, along with commercial development in 1993. The 1896 map shows the beginnings of I-80 and Columbus Parkway, with a nearby residence. By 1940, a transmission line spans APN 182-010-010, and a residence and access road emerge but disappear by 1950. Another transmission line appears in 1950, with no other structures noted on APN 182-010-010 (**Appendix I-1**).

Field Surveys, 129-acre APN 182-010-010

<u>January 2016</u>

AES Archaeologist Charlane Gross conducted a pedestrian field survey of APN 182-010-010 in January 2016. The survey employed parallel pedestrian transects spaced 15 meters apart, with a focus on the area around CA-SOL-275. However, newly growing spring vegetation obscured ground surface visibility to varying degrees, averaging around 40 percent overall. The field inspection focused on areas around CA-SOL-275, documenting the main mine pit, mining debris, and chert artifacts. Discrepancies were noted compared to the original 1980 descriptions, particularly the absence of milling equipment. Instead, scattered lumber, metal sheeting, and metal cable were found. Additionally, two additional mine pits were discovered northeast of the original site, forming a larger complex. A significant accumulation of tailings from these mine pits was also observed (**Appendix I-1**).

<u>September 9, 2022</u>

The September 2022 AES survey of APN 182-010-010 revealed new discoveries, including two historic era mine adit/exploratory tunnels—one definite and the other possible but not completely clear. Additionally, a spring box with a small iron catchment tank and a shallow prospect area east of the mine pits were observed. The complex, approximately 2,570 feet long and 700 feet wide, features tailings piles of varying shapes and heights surrounding the mine pits, with drainages formed between some of them. AES recommended that the chert quarry and the serpentine mine complex do not meet the criteria for inclusion on the NRHP due to their limited historical or archaeological significance (**Appendix I-1**).

Records and Literature Search, 32.5 acres APNs 182-020-080, 182-020-010, and 182-020-020

Archival research included an examination of the library and project files at Tom Origer & Associates. A review of archeological site maps, records, survey reports, and other materials was conducted at the Northwest Information Center at Sonoma State University on December 6, 2019. Information sources included listings from the National Register of Historic Places, California Historical Landmarks, California Register of Historical Resources, and California Points of Historical Interest, as noted in the Office of Historic Preservation's Historic Property Directory. Results found that the southeastern 32.5-acre portion of the Project Site was included in two previous cultural resource studies. Although these studies identified cultural resources, none were found within the southeastern 32.5-acre portion of the Project Site. Additionally, seven studies have been conducted within a half-mile of the Project Site. Three resources were identified within a ½ mile radius of the Project Site, although they were never formally documented. The closest resource is approximately 1,100 feet from the Project Site and does not extend into it (**Appendix I-2**).

To predict the sensitivity for buried archaeological sites, a model was formulated based on the Project Site's landform age, slope, and proximity to water. Results show there is a moderate potential for buried archaeological site indicators within the southeastern 32.5-acre portion of the Project Site (**Appendix I-2**). In addition, Meyer and Rosenthal (2007) determined that the Project Site consists of pre-Holocene geological deposits. These deposits typically pre-date human occupation of the area and exhibit a low potential for the presence of buried deposits of cultural resources.

Because the OHP determined that structures older than 45 years old could be considered important historical resources, archival research involved examining 19th and 20th-century maps and aerial photographs to understand historical development in the area. The maps revealed a building within the southeastern 32.5-acre portion of the Project Site as early as 1896, with a road at the western end of the property. Additional buildings appeared between 1901 and 1940. These structures were removed between 1982 and 1993, according to map and aerial photograph evidence. The road was removed between 1901 and 1940. The current buildings within the southeastern 32.5-acre portion of the Project Site associated with the horse facility were constructed between 1993 and 2002 (**Appendix I-2**).

Field Survey, 32.5-acre APN 182-020-080, 182-020-010, 182-020-020

<u>January 3, 2020</u>

On January 3, 2020, Taylor Alshuth and Julia Karnowski conducted a field survey of APNs 182-020-080, 182-020-010 and 182-020-020, spending approximately 5.5 hours in the field. The surface examination involved walking in 10 to 15-meter transects, with varying ground visibility due to vegetation and buildings, and debris piles scattered in the western half of the southeastern 32.5-acre portion of the Project Site. Hoes were used as needed to expose the ground surface. Additionally, four hand-dug auger borings were excavated using a 4-inch diameter barrel auger to examine subsurface soils. The field survey found no archeological sites within the southeastern 32.5-acre portion of the Project Site, however corrugated metal and wood stables, paddocks, a possible crossing, two concrete patios, and four transmission line towers were observed within the built environment (**Appendix I-2**).

SOCIOECONOMIC CONDITIONS – SECTION 3.7 OF THE EA

Regulatory Setting

Executive Order 12898

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, as amended, directs federal agencies to develop an Environmental Justice Strategy that identifies and addresses disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. The CEQ has oversight responsibility of the federal government’s compliance with EO 12898 and NEPA. The CEQ, in consultation with the USEPA and other agencies, has developed guidance to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed.

The document *Final Guidance for Incorporating Environmental Justice Concerns in EPA’s NEPA Compliance Analyses* provides the following direction on how to analyze the impacts of actions on low-income and minority populations:

> *Under NEPA, the identification of a disproportionately high and adverse human health or environmental effect on a low-income population, minority population, or Indian tribe does not preclude a proposed agency action from going forward, nor does it necessarily compel a conclusion that a proposed action is*

environmentally unsatisfactory. Rather, the identification of such an effect should heighten agency attention to alternatives (including alternative sites), mitigation strategies, monitoring needs, and preferences expressed by the affected community or population. (USEPA, 1998)

As previously stated, according to guidance from the CEQ (1997) and USEPA (1998), agencies should consider the composition of the affected area, to determine whether minority populations, low-income populations, or Indian tribes are present in the area affected by a proposed action and, if so, whether there may be disproportionately high and adverse environmental effects to those populations.

Communities may be considered “minority” under the executive order if one of the following characteristics apply.

- The cumulative percentage of minorities within a census tract is greater than 50 percent (primary method of analysis); or
- The cumulative percentage of minorities within a census tract is less than 50 percent, but the percentage of minorities is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (secondary method of analysis).

According to USEPA, either the county or the state can be used when considering the scope of the “general population.” A definition of “meaningfully greater” is not given by the CEQ or USEPA, although the latter has noted that any affected area that has a percentage of minorities above the state’s percentage is a potential minority community and any affected area with a minority percentage double that of the state’s is a definite minority community under EO 12898.

Communities may be considered “low-income” under the EO if one of the following characteristics applies.

- The median household income for a census tract is below the poverty line (primary method of analysis); or
- Other indications are present that indicate a low-income community is present within the census tract (secondary method of analysis).

In most cases, the primary method of analysis will suffice to determine whether a low-income community exists in the affected environment. However, when a census tract income may be just over the poverty line or where a low-income pocket within the tract appears likely, the secondary method of analysis may be warranted. Other indications of a low-income community under the secondary method of analysis include presence of households whose income is less than or equal to 200% of the poverty level (USEPA, 2022b).

Executive Order 14096

EO 14096, issued in April of 2023, amends and expands certain provisions of EO 12898, and includes the following:

- Provides a broader definition of potentially disadvantaged communities.
- Explicitly expands definition of potentially disadvantaged communities to include persons with a Tribal affiliation and disabled persons;
- Requires Federal Agencies to fulfill environmental justice reporting requirements and prepare strategic plans; and
- Describes additional reporting and notification requirements related to toxic spills.

Environmental Setting

Environmental Justice Screening Tools

The U.S. Federal Government has several tools that can be used to access high-resolution environmental and demographic information for locations in the U.S. and compare their selected locations to the rest of the state, USEPA region, or the nation. These tools can help identify areas with people of color and/or low-income populations, potential environmental quality issues, or a combination of environmental and demographic indicators that are greater than usual. The Environmental Justice Screening and Mapping Tool (version 2.2) and the Climate and Economic Justice Screening Tool (version 1.0) were used to identify potentially disadvantaged communities and other demographics near the Project Site. Using USEPA's Environmental Justice Screening and Mapping Tool (EJScreen, version 2.2), the census tract containing the Project Site was within the 81st percentile for people of color and in the 26th percentile for low-income demographics compared to the rest of the U.S., as shown in **Table 7.** Additional demographic data is listed in **Appendix J**.

Table 7: EJScreen Report - Project Site Census Tract 2501.06 Compared to California and U.S.

Variables	Value	State Average	State Percentile	U.S. Average	U.S. Percentile
People of Color	76%	61%	63	39%	81
Low Income	14%	28%	30	31%	26
Unemployment Rate	6%	7%	53	6%	62
Less than High School Education	6%	16%	35	12%	41
Particulate Matter (µg/m^3)	7.72	8.65	35	8.08	37
Ozone (ppb)	55.7	65.9	15	61.6	11
Air Toxics Cancer Risk[1] (lifetime risk per million)	20	27	3	25	5

Notes: ppb = parts per billion
Source: **Appendix J.**
[1]Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the USEPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding.

EJScreen was used to identify if the Project Site was considered a disadvantaged community. The mapping tool ranks most of the burdens using percentiles. The percentiles show how much burden each tract experiences when compared to other tracts. A community is considered disadvantaged if it is in a census tract that is at or above the threshold for one or more environmental, climate, or other burdens and at or above the threshold for an associated economic burden. If a tract is completely surrounded by disadvantaged communities and is at or above the 50th percentile for low income, it is considered disadvantaged. According to EJScreen, the Project Site is below the thresholds for disadvantaged consideration in all listed aspects (**Appendix J**).

The Climate Economic Justice Screen Tool (version 1) also identified the Project Site census tract as not disadvantaged (Council on Environmental Quality, 2024).

TRANSPORTATION/CIRCULATION – SECTION 3.8 OF THE EA

Regulatory Setting

State and Local

California Department of Transportation (Caltrans)

Caltrans has jurisdiction over State highways. Therefore, Caltrans controls all construction, modification, and maintenance of State highways, such as U.S. 101. Any improvements to these roadways would require Caltrans' approval.

Vallejo General Plan

The Transportation and Circulation Element included in the City of Vallejo General Plan was prepared pursuant to Section 65302(b) of the California Government. Code. The Transportation and Circulation Element addresses the location and extent of existing and planned transportation routes, terminals, and other local public utilities and facilities. The General Plan identifies roadway and transit goals and policies that have been adopted to ensure that the transportation system of the City will have adequate capacity to serve planned growth. These goals and policies are intended to provide a plan and implementation measures for an integrated, multi-modal transportation system that will safely and efficiently meet the transportation needs of all economic and social segments of the City.

Solano Transportation Authority Comprehensive Transportation Plan

The Comprehensive Transportation Plan (CTP) for Solano County identifies, plans, and prioritizes the transportation needs of Solano County through 2040. Solano County's transportation planning agency, the Solano Transportation Authority (STA), as the Transportation Planning and Congestion Management Agency for Solano County, developed the CTP 2040 in collaboration with its many transportation partners and the public. The CTP identifies overall policies as well as specific policies and projects for key plan elements including: arterials, highways, freeways, transit, and alternative modes.

LAND USE – SECTION 3.9 OF THE EA

Regulatory Setting

Federal

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that federal programs are administered in a matter that is compatible with state and local units of government, and private programs and policies to protect farmland (7 U.S.C. § 4201).

The Natural Resource Conservation Service (NRCS) is responsible for the implementation of the FPPA and categorizes farmland in a number of ways. These categories include prime farmland, farmland of statewide importance, and unique farmland. Prime farmland is considered to have the best possible features to sustain long-term productivity. Farmland of statewide importance includes farmland similar to prime farmland, but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Unique farmland is characterized by inferior soils and, depending on climate, generally needs irrigation.

The NRCS fulfills the directives of the Soil and Water Conservation Act (16 USC § 2001-2009) by identifying significant areas of concern for the protection of national resources. NRCS uses a land evaluation and site assessment system to establish a Farmland Conversion Impact Rating (FCIR) score. The FCIR is completed on form AD-1006. The FCIR form has two components: land evaluation, which rates soil quality up to 100 points, and the site assessment, which measures other factors that affect the property's viability up to 160 points.

The total FCIR score is used as an indicator for the project's sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the allowable level; however, the FPPA does not require federal agencies to alter projects to avoid or minimize farmland conversion. Sites receiving a combined score of less than 160 (out of 260 possible points) do not require further evaluation. For sites with a combined score greater than 160 points, at least two other alternatives are required to be considered and the alternative with the lowest number of points selected unless there are other overriding considerations.

Federal Aviation Regulation

In accordance with 14 CFR 77, which provides requirements, standards, and processes for determining obstructions to air navigation, the Federal Aviation Administration's (FAA's) primary objective is to promote air safety and the efficient use of the navigable airspace. In furthering this mission, the FAA conducts aeronautical studies based on information provided on FAA Form 7460-1, Notice of Proposed Construction or Alteration, by proponents of construction or development in the vicinity of airports. Developers must file Form 7460-1 with the FAA at least 45 days prior to construction if any of the following parameters are met:

- Proposed structure(s) will exceed 200 feet above ground level;
- Proposed structure(s) will be in proximity to an airport and will exceed the slope ratio;
- Proposed structure(s) involves construction of a traverseway (i.e., highway, railroad, waterway, etc.) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b);
- Proposed structure(s) will emit frequencies, and do/does not meet the conditions of the FAA Colocation Policy;
- Proposed structure(s) will be in an instrument approach area and might exceed part 77 Subpart C;
- Proposed structure(s) will be in proximity to a navigation facility and may impact the assurance of navigation signal reception;
- Proposed structure(s) will be on an airport or heliport; or
- Filing has been requested by the FAA (FAA, 2017a).

State and Local

Solano County General Plan

The Solano County General Plan is a comprehensive document that guides land use, development, and conservation in Solano County, California. The land use and agricultural chapters of the Solano County General Plan work together to ensure that agricultural designated parcels are preserved, supported economically, and managed sustainably within the broader framework of land use planning and development in the County.

Chapter 2: Land Use

The land use chapter of the Solano County General Plan guides development decisions by designating areas for residential, commercial, industrial, agricultural, and open space uses, ensuring balanced growth and preserving the county's unique character and natural resources.

Goal LU.G-4: Encourage land use development patterns and circulation and transportation systems that promote health and wellness and minimize adverse effects on agriculture and natural resources, energy consumption, and air quality.

Chapter 3: Agriculture

The agricultural chapter of the Solano County General Plan emphasizes preserving and supporting sustainable agricultural practices, while managing land use to protect agricultural designated parcels from incompatible development.

Goal AR.G-2: Preserve and protect the county's agricultural lands as irreplaceable resources for present and future generations.

Goal AR.G-5: Reduce conflict between agricultural and nonagricultural uses in Agriculture -designated areas.

City of Vallejo General Plan 2040

The Propel Vallejo General Plan 2040 is a comprehensive long-term planning document that outlines the vision, goals, policies, and strategies for the future development and growth of Vallejo, California, up to the year 2040. It serves as a blueprint for guiding land use, transportation, housing, economic development, environmental conservation, and other aspects of community development within the city.

Land Use Element

The General Plan is the city's primary land use regulatory tool and outlines the steps needed to achieve the community's vision for the future. General Plan 2040 includes four chapters that set goals, policies, and actions for seven elements, including land use, which is discussed below.

Goal NBE-1: Beautiful City: Preserve and enhance the natural, historic, and scenic resources that make Vallejo special.

> **Policy NBE-1.1**: Natural Resources. Protect and enhance hillsides, waterways, wetlands, occurrences of special-status species and sensitive natural communities, and aquatic and important wildlife habitat through land use decisions that avoid and mitigate potential environmental impacts on these resources to the extent feasible.
>
> > **Action NBE-1.1F**: Require a biological assessment for new development proposed on sites that are determined to have some potential to contain sensitive biological and wetland resources. The assessment should be conducted by a qualified professional to determine the presence or absence of any sensitive resources, should evaluate potential adverse effects, and should define measures for protecting the resources in compliance with State and federal laws. Detailed surveys are not necessary in locations where past and existing development have eliminated natural habitat and the potential for presence of sensitive biological resources.

Policy NBE-1.2: Sensitive Resources. Ensure that adverse impacts on sensitive biological resources, including special-status species, sensitive natural communities, and wetlands are avoided and mitigated to the greatest extent feasible as development takes place.

Policy NBE-1.5: Scenic Vistas. Protect and improve scenic vistas, including views from Interstate 80 and State Route 37 in Vallejo.

Action NBE-1.5B: Update City regulations for development within view of freeways in Vallejo.

Policy NBE-1.9: Cultural Resources. Protect and preserve archaeological, historic, and other cultural resources.

Action NBE-1.9A: Continue to require that land use activities comply with State requirements and follow best practices to ensure that cultural resources are not impacted and that appropriate agencies and technical experts are involved in the evaluation and protection of resources and sites.

Action NBE-1.9B: Maintain a dialogue with local Native American groups regarding sensitive cultural resources in Vallejo.

Goal NBE-2: A Place Where People Want to Be: Establish Vallejo as an attractive place to live, work, shop, and enjoy time off

Policy NBE-2.3: Inviting, Compatible Design. Promote attractive development that is compatible with surrounding uses.

Action NBE-2.3A: Continue to utilize development approval conditions to achieve compatibility between nearby uses and scale and style of buildings, and to establish limitations on activities that could create potential adverse effects.

Policy NBE-2.4: Regional Retail and Entertainment. Support a thriving mix of regional retail and entertainment uses near Interstate 80.

Action NBE-2.5A: Work with property owners in the Northgate Area to retain and attract businesses that cater both to local residents and regional shoppers, including through circulation and wayfinding improvements.

Policy NBE-2.8: Infill Development. Promote infill development targets vacant and underutilized sites for community-desired and enhancing uses that is compatible with surrounding uses.

Action NBE-2.8A: Identify sites suitable for redevelopment; work with property owners to promote economically feasible and community desired uses that enhance and are compatible with the existing urban fabric.

Goal NBE-3: Pride in Identity: Nurture distinct districts and neighborhoods that contribute to a sense of local pride.

Policy NBE-3.7: Solano360. Achieve the objectives of the Solano360 Specific Plan.

Action NBE-3.7A: Implement Solano360 actions as resources allow.

Policy NBE-3.8: North Gateway. Accelerate investment in the North Gateway area to achieve a mixed-use district that caters to both locals and regional travelers to Napa Valley.

Action NBE-3.8A: Target business attraction strategies for the North Gateway that can take advantage of local commercial needs, as well as the area's location at the entry to the wine country.

Policy NBE-3.13: Neighborhood Character. Preserve the character of existing single-family residential neighborhoods.

Action NBE-3.13A: Continue to carefully review development proposals to preclude substantial increases in density and new land uses in order to minimize the impact to the character of existing single-family neighborhoods.

Goal NBE-5: Hazard Protection: Protect life and property from natural and human-made hazards.

Policy NBE-5.4: Project Location and Design. Prohibit development in any area where it is determined that the potential risk from natural hazards cannot be mitigated to acceptable levels.

Action NBE-5.4A: Continue to require geotechnical studies for land use proposals to determine engineering measures that may be necessary to adequately mitigate any seismic, flooding, sea level rise, landslide, erosion, or related risk.

Action NBE-5.4B: Continue to require drainage and erosion control measures for landslide-prone or geologically hazardous hillside areas to minimize risks to downhill areas.

Goal MTC-1: Regional Transportation Hub: Make Vallejo a regional transportation hub for people and goods.

Policy MTC-1.6: Public Access. Promote public access to open space and trails.

City of Vallejo Title 16: Zoning Code

The City of Vallejo Zoning Ordinance is a set of regulations that govern land use and development within the city. It is designed to implement the policies and goals of the city's General Plan by providing detailed rules for what can be built and how land can be used in different parts of Vallejo. The Zoning Code provides the following description of zoning found on the Project Site. **Figure 3.9-2** of the EA provides a map of the City's zoning for the Project Site and adjacent parcels.

RC Regional Commercial: The RC Zoning District is intended to create and establish regulations for sites that provide general retail, services, and commercial recreation and entertainment for local residents as well as consumers and visitors from the region. Design and development standards will accommodate auto-oriented uses and require buffering and transitions to adjacent residential neighborhoods.

PROS Parks, Recreation, and Open Space: The PROS Zoning District is intended to create and establish regulations for parks, recreation, and open space areas allowing for recreational activities and/or natural resource preservation.

Environmental Setting

Surrounding Land Uses and Zoning

The Project Site is located within and adjacent to the City of Vallejo boundaries in Solano County, California, and is currently undeveloped, except for several unpaved ranch roads. The Project site is zoned and designated Regional Commercial (RC), and Parks, Recreation and Open Space (PROS), in the City of Vallejo Zoning Ordinance. The RC designation supports general retail, services, and commercial recreation and entertainment for local residents as well as consumers and visitors from the wider region. The PROS designation supports parks, recreation areas, and open spaces for recreation and conservation (City of Vallejo, 2021a, City of Vallejo, 2021b). The General Plan designates the Project Site Business and Limited Residential (B/LR) and PROS. The B/LR designation supports high quality employment-based businesses, alongside amenities like restaurants, retail, and residential components if compatible. The General Plan outlines a broad vision and framework for land use in Vallejo, while the Zoning Ordinance provides specific standards to regulate current development, however both are internally consistent (City of Vallejo, 2017a, City of Vallejo 2017b).

The Project Site is bordered by I-80 on the west, Columbus Parkway on the south, a combination of open space and public and semi-public on the east, and agricultural parcels in unincorporated Solano County to the north. The area west of the Project site is adjacent to I-80, which is designated public and semi-public, while the area beyond I-80 is designated residential low density. The area south of the Project Site, beyond Columbus Parkway, is designated regional commercial and residential medium density. The area southwest of the Project Site, currently occupied by the county-owned fairgrounds property, is designated Solano360 (SP-5). The SP-5 land use designation is intended to facilitate the Solano360 Specific Plan and foster the creation of an iconic region serving public entertainment (City of Vallejo, 2017a). Furthermore, the Project is adjacent to the former Northgate Specific Plan, a large-scale mixed-use commercial development project. Due to the buildout of the area, the Northgate Specific Plan has effectively been achieved and the land use designations have been incorporated into the land use map of the General Plan (City of Vallejo, 2017a).

The Project Site is within the I-80/SR 37 Gateway Area, near key regional areas such as Gateway Plaza, Six Flags Discovery Kingdom, and the Solano County Fairgrounds. The General Plan aims to support these attractions with new commercial and residential development, strengthening the sense of place at this important regional destination in Vallejo. Development in this area aims to bring more patrons to the planned restaurant, retail, and entertainment uses on the fairgrounds site, supporting the vision described in the Solano360 Specific Plan.

Regional access to the Project Site is provided by I-80, which runs in a north-south direction adjacent to the site's western boundary, and Highway 37 that terminates at a junction with I-80 approximately 0.15 miles west of the Project Site. Local access to the Project Site is currently provided through an existing driveway off Columbus Parkway on the neighboring property. The eastern portion of the property, though which access roads will be built, supports a horse boarding facility characterized by an assemblage of wooden structures and piles of debris, concrete and wood scattered throughout the site. Old concrete slabs indicate the presence of former buildings onsite. The western portion of the property consists of open space and supports grazing.

The Napa County Airport is located approximately six miles northwest of the Project Site. The Project Site is located outside of the Airport Safety Zone for this airport (Napa County Airport Land Use Commission, 1991). The New Horizons Montessori School is located 0.25 miles southwest of the Project site, beyond the I-80 and Highway 37 junction. The Solano Community College Vallejo Center is located 0.7 miles east of the Project Site. There are no churches or libraries located within one mile of the Project site.

Agriculture

The U.S. Department of Agriculture (USDA) conducts a state-by-state census of agriculture every five years. The National Agriculture Statistical Service collects census data from a list of all known potential agriculture operators. The census reports on various statistics relating to crop yields, farm acreage, and farm economics. According to the 2022 Census of Agriculture, a total of 339,476 acres in Solano County are used for farming purposes (USDA, 2022).

The State of California developed the Farmland Mapping and Monitoring Program (FMMP) to provide data to decision makers for use in planning for the present and future of California's agricultural land resources. Prime farmland is a designation applied to lands with the best combination of physical and chemical features able to sustain long-term agriculture. Farmland of Statewide Importance is a designation applied to lands that are similar to Prime Farmland but with minor shortcomings, such as large slopes or the diminished ability to store soil moisture. Unique farmland is comprised of lesser quality soils used for the production of the State's leading agricultural crops (DOC, 2024).

PUBLIC SERVICES AND UTILITIES– SECTION 3.10 OF THE EA

Regulatory Setting

Federal

Safe Drinking Water Act and Clean Water Act

See **Water Resources – Section 3.3 of the EA** above.

Public Law 280

Public Law 280 was enacted in 1953 to grant certain states criminal jurisdiction over Indians on reservations in addition to permitting civil litigation under tribal or federal court jurisdiction to be handled by state courts. The states mandated to assume criminal and civil jurisdiction over federal Indian lands are Alaska, California, Minnesota, Nebraska, Oregon, and Wisconsin, although certain tribal lands are exempt, including Metlakatla Indian Community on the Annette Island Reserve, Red Lake Reservation, and Warm Springs Reservation. In addition to these states, other states elected to assume full or partial responsibility, including Arizona, Florida, Idaho, Iowa, Montana, Nevada, North Dakota and Utah. The federal government relinquished all special criminal jurisdictions over Indian offenders and victims in these states. However, Public Law 280 does not grant states the following regulatory powers over lands held in federal trust or tribes:

- Federally guaranteed fishing, tribal hunting, and trapping rights;
- Fundamental tribal governmental functions, such as domestics relations and tribal enrollment; and
- Authority to impose state taxes.

Due to the one-sided process that imposed state jurisdiction on tribes and the complete failure to recognize tribal sovereignty and tribal self-determination, Public Law 280 was opposed by Indian Nations from its enactment. Subsequent acts of Congress, court decisions, and state actions to retrocede (or give back) jurisdiction back to the federal government have mitigated some of the effects of the 1953 law and strengthened tribes’ jurisdiction over civil and criminal matters on their reservations.

State and Local

California Integrated Waste Management Act (Assembly Bill 939)

In 1989, the State of California enacted AB 939, the California Integrated Waste Management Act, which requires jurisdictions to conduct a solid waste disposal needs assessment that estimates the disposal capacity needed to accommodate projected solid waste generated within the jurisdiction and to identify a minimum of 15 years of permitted disposal capacity. All local jurisdictions are required to divert 50 percent of their total waste stream from landfill disposal.

City of Vallejo 2020 Urban Water Management Plan (UWMP)

In 1983, the State of California created the Urban Water Management Planning Act, which requires urban water suppliers serving over 3,000 customers or supplying at least 3,000 acre-feet of water annually to:

1. prepare/adopt an urban water management plan every five years;
2. demonstrate water supply reliability in a normal, single dry, and drought years lasting at least five years over a twenty-year planning horizon;
3. prepare a drought risk assessment and water shortage contingency plan; and
4. Since July 2022, prepare an annual water supply and demand assessment.

The UWMP is the legal and technical water management foundation for urban water suppliers in California which gathers, characterizes, and synthesizes water-related information from sources into a plan with local, regional, and statewide practical utility. The City of Vallejo has numerous water supply sources that are derived from water rights and contracts and provide significant annual volumes of water that are used to meet contractual obligations and end-user demands. The water supplies are derived from four surface water sources including:

- Sacramento River watershed, which includes appropriative water right license 7848 and a contract with Solano County Water Agency for State Water Project water supplies
- Solano Project from Putah Creek watershed (includes Lake Berryessa)
- Wild Horse Creek watershed through Lakes Marigan and Frey, and the Green Valley Diversion
- Upper Suisun Creek watershed through Lake Curry.

The water service area boundary contains two water systems including the Vallejo City System/Vallejo City Service Area which delivers supplies from Fleming Hill water treatment plant (WTP) and the Vallejo Lakes System/Vallejo Lakes Service Area which delivers water from the Green Valley WTP. In addition, the City supplies water to Travis Air Force Base, American Canyon, and other areas both inside and outside the City's service area boundary. The city does not use recycled water in its service area nor does the city have any groundwater supply sources.

The City of Vallejo receives its treated water from the Fleming Hill WTP. This WTP is a conventional 42 million gallons per day (mgd) treatment plant with ozonation (pre and intermediate). The plant receives and treats water from the Solano Project (Lake Berryessa) and from the Sacramento River Delta through the North Bay Aqueduct.

Water Demands

A portion of the Project Site was assumed to be developed for business/limited residential. Projected population and water demands included planned and assumed developments including the Solano360 Specific Plan which includes 50 housing units and a 330,000 square foot entertainment/mixed use area. With population growth (currently 125,000 to over 150,000 people), the water service area and water demand are expected to increase in the City of Vallejo through the UWMP's planning horizon year 2045. "The city currently produces just over 20,000 acre-feet of treated water annually to meet this demand, with additional raw water services to City and wholesale customers that can demand nearly 6,000 acre-feet per year (though the actual need varies each year)" (City of Vallejo, 2021). In anticipation of future growth, the city is expected to increase water supply demand by 3,000 to 4,000 acre-feet by 2045.

Forecasted water demands for the city to year 2045 are shown in **Table 8** below. These demand forecasts are for expected water needs under normal hydrologic conditions. The wholesale raw demand in 2025 is estimated to be 6,003 AFY and remain the same in 2045, with no growth projected for raw water connections. Is estimated that a 5 percent increase would be added to the total estimated demand for the forecasted drought risk assessment.

The 2020 UWMP also includes a projected disadvantaged community water use calculation per California Health and Safety Code Section 50079.5. A lower income household has an income below 80 percent of the area's median income, adjusted for family size. The annual median income was derived from the 2019 US Census Bureau and was approximately 71,300 dollars for the city. Therefore, 80 percent would be approximately 57,000 dollars per year. For the purpose of estimating future water needs, 37 percent of the total City single-family and multi-family demands from the table above are presumed to represent disadvantaged households. Using these numbers to forecast the water use for the entire City results in an estimate of 12,368 AFY (4,576 AFY forecasted) in 2025 to 16,429 AFY (6,079 AFY forecasted) in 2045.

Table 8: Forecasted Water Demands (AFY)

Service Area	2025	2030	2035	2040	2045
Treated Water Service					
Total City/Unincorporated	21,369	22,406	23,579	25,132	25,122
Total Lakes	740	744	748	752	766
Total Treated Water Service	22,108	23,150	24,328	25,885	25,889
Raw Water Service					
Total Wholesale Raw	6,003	6,003	6,003	6,003	6,003
Grand Total (Treated and Raw)	**28,111**	**29,153**	**30,311**	**31,888**	**31,892**

Source: City of Vallejo, 2021

Table 9 shows the current, normal, and single dry year supplies and demands.

Table 9: Normal and Single Dry Year Water Supply and Demand (AFY)

Year	Current	2025	2030	2035	2040	2045
Normal Year						
Supply	35,695	35,820	35,823	35,825	38,778	38,780
Demand	26,824	28,111	29,153	30,331	31,888	31,892
Difference	8,871	7,709	6,670	5,494	6,890	6,888
Single Dry Year						
Supply	30,610	31,585	31,588	31,590	33,093	33,095
Demand	28,236	29,113	30,207	31,443	33,079	33,083
Difference	2,374	2,472	1,381	147	14	12

Source: City of Vallejo, 2021

Table 10 shows the multi-year drought supply totals.

Table 10: Vallejo Municipal System Water Supply Management Multi-Year Drought Supply (AF)

Year	Supply
2021	35,176
2022	32,592
2023	28,941
2024	29,078
2025	29,718

Source: City of Vallejo, 2021

When evaluating on an annual basis, the city is capable of meeting the forecasted water demands throughout the Vallejo Municipal Service Area in normal years through 2045. During single-dry and multiple-dry years, depending on how the city manages its supply, demands could come close to exhausting supplies, triggering a water shortage contingency plan (WSCP). Projected predictions and conditions are evaluated at the beginning of each year.

Water Shortage Contingency Plan

The WSCP allows the City to reduce water demands on the water system in times of shortage or catastrophic outage conditions. Measures that are put into place include typical dry condition water management actions including "mandatory outdoor irrigation during evening, nights, and early mornings imbedded into six water shortage categories (up to 10%, 11-20%, 21-30%, 30-40%, 40-50%, and over 50%)" (City of Vallejo, 2021). If a catastrophic water outage in the City were to occur, water demands would be limited to use for health and safety purposes only. The combination of the WSCP with the City's active water management of its supply portfolio provides an additional buffer against unpredictable water conditions.

The City of Vallejo's surface water portfolio, active management of its water supply portfolio, and its WSCP provide the city with a stable and reliable water service to meet the current and 2045 projected water demands with supply reliability encompassing normal, single dry, and five consecutive dry year scenarios.

City of Vallejo Water Master Plan 2015

The City of Vallejo Water Master Plan (WMP) is an update of the City's 1996 plan. The WMP includes water demand projections by pressure zone for the city service area projected to the year 2035. It also includes an update to the water system hydraulic model, evaluation of the feasibility of constructing a water transmission main line connecting to the Fleming Hill WTP Clearwell to the Mare Island storage tanks, identifies infrastructure improvements, and produces and updated capital improvement program to support short and long-range capital improvement requirements (City of Vallejo, 2015).

This WMP focuses on the City of Vallejo Water System and does not include the City of Vallejo Lakes System. The Fleming Hill WTP treats the surface water used to service the Vallejo Water System service area and supplies water to all the pressure zones. Details regarding the Fleming Hill WTP are discussed above under the Urban Water Management Plan.

Infrastructure

The City of Vallejo's potable water system consists of a network of pumps, eight main pressure zones (with multiple subzones) and three hydropneumatic zones, supply connections and reservoirs/tanks. The City maintains over 440 miles of pipelines, 17 active pumping stations, 23 storage facilities, and 16 pressure regulating stations to support the delivery of water throughout the City.

The distribution system pipelines range in size from 1-inch to 42-inch in diameter. The pipes are predominantly cast iron and ductile iron pipe.

The Project Site is located in Pressure Zone 292, with storage reservoir R-05 (Columbus Parkway Tank) adjacent to the eastern boundary of the Project Site. The 292 Pressure Zone has two subzones, the Trans Vallejo, which gets its water supply from Fleming Hill Clearwell and Skyview/Columbus Reservoirs, and Glen Cove, which gets its water supply from Glen Cove Reservoir. Both subzones serve elevations of 40 to 160 feet with a static pressure range of 57 to 110 psi.

The water system includes 23 storage reservoirs, ranging in size from 0.1 million gallons (MG) to 37.4 MG with a total storage capacity of 86.6 MG. These reservoirs provide operational storage for daily demands as well as emergency and fire flow storage. The Columbus Parkway reservoir has a storage volume of 6 MG, the Glen Cove reservoir has a storage volume of 1.5 MG, and the Skyview reservoir has a storage volume of 6 MG. Currently there are no hydropneumatics tanks within Pressure Zone 292.

The pump stations vary in size from 10 to 250 horsepower and 100 to 5,000 gallons per minute (gpm) design capacities. The majority of the pumps are electric, but those servicing Pressure Zone 292 are gas driven. The pump stations that service to and from Pressure Zone 292 have design capacities from 400 to 5,000 gpm.

The water system uses 15 pressure regulating valves (PRVs) and one flow control valve (FCV) to transfer water between pressure zones. There are four PRVs within Pressure Zone 292, two are normally closed and two are normally open (City of Vallejo, 2015).

Vallejo Flood and Wastewater District Sanitary Sewer Collection Plan

The Vallejo Flood and Wastewater District (VFWD) was established in 1952 by the State of California as an independent special district responsible for maintaining separate storm drainage and wastewater collection and treatment systems within its service area. The VFWD serves the City of Vallejo and other adjacent unincorporated areas (VFWD, 2023).

This sanitary sewer collection plan's purpose is to:

- Update the VFWD's hydraulic model;
- Implement a 2-year flow monitoring program;
- Develop a rehabilitation and replacement program;
- Identify existing and future capacity deficiencies in the collection system; and
- Develop and prioritize a capital improvement plan to address capacity deficiencies.

The VFWD services approximately 32,787 acres of developed land, with 4,765 acres of that land designated as commercial, and 12,557 acres of that land designated as open space. The Project Site is designated commercial and open space.

Current Infrastructure

The collection system consists of over 370 miles of sanitary sewer mains, with diameters ranging from 4-inches to 60-inches). The system also has 36 sanitary sewer pump stations; 6.4 miles of pressurized force mains, with diameters ranging from 3-inches to 30-inches; and two equalization storage facilities, with 11 MG capacities. The Ryder Street Wastewater Treatment Plant treats all wastewater flows generated within the collection system.

Future Development

Currently, the Project Site is flanked by two of the seven specific plan areas that will be developed based off the City of Vallejo's General Plan 2040. These consist of the Solano360 specific plan, located to the west of the Project Site, which has 149.1 vacant acres to be developed by buildout contributing to additional flow, and the Northgate specific plan, which will not contribute to additional flow at buildout, since it is not vacant. Only the Solano360 specific plan will contribute to additional flow.

Additionally, the VFWD considered the development of additional dwelling units (ADUs) to the land. ADUs are attached or detached residential dwelling units on the same lot as an existing dwelling unit zoned for single-family or multi-family use. It was assumed that the number of ADUs throughout the collection system would increase by 20 percent every year over the next five years and then increase by five percent every year until the year 2040, with a total number of 2,778 expected by 2040.

The master plan includes several improvements to wastewater mains, pump stations, and storage tanks for rehabilitation, replacement, or capacity increases to accommodate future buildout. VFWD requires prospective project applicants to contract with VFWD for a study to demonstrate that it is possible to provide sewer service to a project and prove that the system has capacity to handle the increase in flows. The projected wastewater flows for existing and buildout is included in **Table 11** below.

Table 11: Projected Wastewater Flow

Period	ADWF (mgd)[1]	PWWF (mgd)[2]
Existing	7.86	86.78
Buildout	8.46	90.91[3]

Notes: 1) Average Dry Weather Flow; 2) Peak Wet Weather Flow; 3) Model simulated, system wide peak hourly flow for the entire system.

Source: VFWD, 2023.

Environmental Setting

Water Supply

Water Supply Infrastructure

The Project Site is currently within the 292 Trans Vallejo pressure zone of the City's Municipal Water System (Vallejo MWS; City of Vallejo, 2015) and the horse boarding facility currently obtains water from the City. As described in **Sections 1.4**, an existing 24-inch transmission main crosses the Project Site from I-80 to the City's 6-million-gallon Columbus Parkway Tank adjacent to the eastern boundary of the Project Site and another 24-inch transmission main crosses the southeastern portion of the Project Site from the Columbus Parkway Tank to a 24-inch transition main that runs along Columbus Parkway. These 24-inch lines are associated with the City's 292 Pressure Zone that is served by the Fleming Hill Water Treatment Plant and Clearwell and Trans Vallejo Pump Station, as well as the Columbus Parkway and Skyview reservoirs. Additionally, a 16-inch transmission main associated with the City's 400 Pressure Zone also runs along Columbus Parkway. Please refer to **Appendix E** and **Appendix B** for additional information regarding water supply infrastructure.

Water Supply Sources and Demand

Water supply for Vallejo MWS is derived from numerous surface water sources through water rights and contracts. Vallejo MWS does not have any groundwater supply sources and has no present intent to develop groundwater supplies in the foreseeable future. Vallejo MWS has access to up to approximately 35,700 acre-feet of raw water during a normal year. During dry years, between approximately 29,000 and 30,600 acre-feet of water is available depending on whether it is a single or multi-year drought. In 2020, total water demand was approximately 13,800 acre-feet. The City of Vallejo 2020 Urban Water Management Plan (UWMP) estimates that the total normal year water demand for the Vallejo MWS is approximately 31,900 acre-feet in 2045, with estimated water demands increasing to approximately 33,000 acre-feet during single and multiple dry years (City of Vallejo, 2021). The UWMP concluded that, through active management, the City has reliable annual water supplies available for its service area through 2045 during normal conditions, though it will need to actively manage these supplies to reliably meet month-by-month customer demands during multi-dry periods. Under single-dry and multiple dry year conditions, supplies are projected to just meet unconstrained demands when assessed on an annual basis. The City's Water Shortage Contingency Plan (WSCP) would be triggered to address any shortcomings identified in a particular year (City of Vallejo, 2021). Please refer to **Appendix E** and **Appendix B** for additional information regarding water supply sources and demand.

The City of Vallejo does not currently use recycled water supplies in its service area because the City's WWTP is not currently equipped to provide the necessary tertiary treatment to meet Title 22 standards (City of Vallejo, 2021). However, the City has prepared a Recycled Water Facilities Plan (RWFP) that identified numerous potential recycled water users within the City that have an estimated total recycled water demand of 2,408 acre-feet per year (AFY; VFWD, 2018). **Figure 2.1-5** of the EA shows the potential recycled water users identified in the RWFP and their respective recycled water demands. For example, Blue Rock Springs Golf Club, located less than two miles southeast of the Project Site (identified with a "1" on **Figure 2.1-5** of the EA) was identified as one of the top potential recycled water users with a demand potential of approximately 500 AFY.

Wastewater Treatment

The Project Site is within the service area of the Vallejo Flood and Wastewater District (VFWD). Wastewater generated within the VFWD is conveyed through various gravity sewers, pump stations, and force mains to the Vallejo WWTP, which has a dry weather capacity of 15.5 million gallons per day (mgd) and a wet weather capacity of 60 mgd (**Appendix B**). **Table 12** summarizes the projected wastewater flows included in the VFWD Sanitary Sewer Collection System Master Plan (VFWD, 2023). The VFWD currently has a 3.2-million-gallon storage tank located at Sears Point Pump Station. This tank is used during peak wet weather flow (PWWF) conditions to contain peak flows, the stored flows in the tank are returned to the pump station when flows have subsided and conveyed to the WWTP for treatment. The VFWD Sanitary Sewer Collection System Master Plan identifies several improvements to wastewater mains, pump stations, and storage tanks for rehabilitation, replacement, or capacity increases to accommodate peak wet weather flows of future buildout in subbasins where inflow and infiltration are excessive. The Sewer Master Plan acknowledges that while future flows do not create the need for additional improvements VFWD is working with developments to contribute to mitigation funding. VFWD requires prospective project applicants to contract with VFWD for a study to demonstrate that it is possible to provide sewer service to a project and prove that the system has capacity to handle the increase in flows. Please refer to **Appendix E** and **Appendix B** for additional information regarding wastewater treatment infrastructure and capacity.

Table 12: Projected Wastewater Flow at VFWD WWTP

Period	ADWF (mgd)	PWWF (mgd)
Existing City Flows	7.86	86.78[1]
Future City Flows	8.46	90.91[1]

Notes: ADWF = Average Dry Weather Flow; PWWF = Peak Wet Weather Flow; mgd = millions of gallons per day; 1) Model simulated, system wide peak hourly flow for the entire system.
Source: VFWD, 2023

Solid Waste

The Solano County Department of Resource Management, Environmental Health Services Division, has a Water Protection and Waste Management Program which implements County programs in liquid waste, water systems, solid waste disposal, wells, and land use and provides assistance in planning and implementation of the Solid Waste Management Program amongst others (Solano County, 2024b). The Environmental Health and Safety Division is the local enforcement agency overseeing the sanitary disposal of solid waste. They issue permits, conduct inspections, monitor, and enforce activities to assure proper storage, collection, transportation, and disposal of solid waste consistent with local and State regulations (Solano County, 2024c).

The City of Vallejo Public Works Department manages recycling and solid waste contract services. Recology Vallejo provides commercial solid waste collection services within the city limits of Vallejo and in the surrounding Solano County area (City of Vallejo, 2024c). Vallejo Garbage Services offers comprehensive commercial recycling services. Waste from the City is brought to the Devlin Road Recycling and Transfer Facility, then loaded into trucks and sent to Potrero Hills Landfill in Suisun, Solano County. The Devlin Road Recycling and Transfer Station is approximately 5.20 miles northwest of the Project Site. The Potrero Hills Landfill is located approximately 13.70 miles northeast of the Project Site. It is permitted to accept up to 4,330 tons per day on peak days, with a maximum permit capacity of 83,100,000 cubic yards (CalRecycle, 2019). Portero Hills Landfill is permitted to accept several different types of waste: tires, sludge (biosolids), mixed municipal, industrial, construction/demolition, ash, and agricultural. The cease operation date for the landfill is February 14, 2048 (CalRecycle, 2019).

Electricity, Natural Gas, and Telecommunications

As described in Section 2.1.9, Pacific Gas and Electric (PG&E) is the primary electric and natural gas provider in northern and central California and serves 16 million people within a 70,000-square-mile service area. There are

106,681 circuit miles of electric distribution lines, 18,466 miles of circuit interconnected transmission lines, 42,141 miles of natural gas distribution pipelines, and 6,438 miles of transmission pipelines (PG&E, 2024c). In 2023, electricity generation and purchases were from 100% greenhouse gas-free sources: 53% nuclear, 34% eligible-renewable resources, and 13% hydroelectric (PG&E, 2024d).

As of April 2024, PG&E has more than 260 renewables portfolio standard-eligible power purchase agreements totaling more than 6,000 megawatts (MW), they also own 430 MW of eligible-renewable generation, which includes 277 MW of small hydroelectric, and 13 solar generation plants, which generate up to 153 MW of clean power. As of March 2024, PG&E has brought online more than 2,100 MW of new incremental battery storage capacity, with an additional 772 MW planned later in 2024, and 687.5 MW planned for 2025. Currently, PG&E has 3.5 gigawatts of total battery energy storage under contract (PG&E, 2024d).

There are transmission lines and associated easements for PG&E that traverse the Project Site north to south; one along the western portion of the project site, parallel to Interstate 80, this area includes 16.12 acres encumbered, and an additional easement area of 6 acres, and another cutting through the northeastern corner of the site. There is a gas transmission line that crosses I-80 and is to the west of the Project Site, this natural gas line is 7.19 miles long, another line runs east of the Project Site and goes past Hiddenbrooke Park, this natural gas line is 2.40 miles long (PHMSA, 2024). The Tribe would contract and coordinate with PG&E to provide services to the Project Site and determine the best connection site.

There are many private companies that provide telephone, internet, and cable services to properties within the vicinity of the Project Site. Companies such as Xfinity, Verizon, T-Mobile, AT&T, Direct Tv, VIP Fiber, Viasat, Earthlink, Hughesnet, Starlink, Unwired, and Always On offer a host of telecommunication services in the region.

Law Enforcement

The Vallejo Police Department provides law enforcement services within the City, including to the Project Site, and the Solano County Sheriff's Office (SCSO) provides law enforcement services to unincorporated areas of the County directly to the east and north. The Vallejo Police Department is located approximately 3.18 miles southwest of the Project Site, and the SCSO is located approximately 11.74 miles northeast of the Project Site in the City of Fairfield.

As of February 2024, the Vallejo Police Department has 73 sworn in staff and 33 working patrol officers. In 2023, there were 163,734 calls received (911 and non-emergency), with 52,236 calls for service (Vallejo Police, 2023). Calls for services include crime reports, felony arrests, officer-initiated incidents, information reports, misdemeanor arrests, traffic stops, use of force incidents, vehicle/pedestrian checks, officer involved shootings, vehicle pursuits, firearm arrests and assaults on officers. Crime statistics in 2022 vs. 2023 had decreased in murder, rape, aggravated assault, residential burglary, stolen vehicles, arson, domestic violence, violent crime, and overall crime. Crime statistics in 2022 vs. 2023 had increased in robbery, commercial burglary, auto larceny, larceny, shootings, and property crime. Traffic fatal collisions had also decreased from 24 to 8 in 2022 vs. 2023 (Vallejo Police, 2024). In 2022, average response time for a priority one call was 11 minutes and 18 seconds, which is about 5 minutes longer than the agency's target response time of 6 minutes. Priority two calls had an average response time of over two hours, despite the agency's target response time of 11 minutes (Crime and Consequences, 2023). In July 2023, Vallejo, California declared a state of emergency over police shortages. The Vallejo Police Department is now working with the SCSO and the California Highway Patrol to help supplement its staff (Police1, 2024).

Fire Protection

The City of Vallejo is served by the Vallejo Fire Department. The fire department consists of 108 employees (administration, suppression, training, and prevention divisions). The department responded to a total of 1,020 fire calls and 11,956 EMS calls in 2023 (**Appendix A**). The Fire suppression division consists of 99 firefighters, firefighter paramedics, engineers, captains, and battalion chiefs. There are six different stations throughout the City of Vallejo, working three shifts to ensure coverage for 24 hours a day, 7 days a week (City of Vallejo, 2024). The closest fire station is Station #27, which is immediately east of the Project Site (approximately 0.20 miles). The Vallejo Fire Department is a non-transport, advanced life support provider and staffs all of its departments with a minimum of one licensed paramedic.

The BIA is responsible for wildland fire management on federal trust land. Under the *California Master Cooperative Wildland Fire Management and Stafford Act Response Agreement* signed in 2007, federal agencies and the California Department of Forestry and Fire Protection (now CAL FIRE) agreed to improve efficiency by facilitating the coordination and exchange of personnel, equipment, supplies, services, and funds for wildfires in addition to improving coordination regarding other incidents. Numerous federal agencies signed this agreement, including the BIA. Under this agreement, agencies can enter into agreements of mutual aid and contract for wildfire related services with each other (BIA et al., 2007). CAL FIRE provides fire protection services to State Responsibility Areas. The Project Site is not located in one of these areas, it is located in a local responsibility area (CAL FIRE, 2024). The nearest State Responsibility Area in which CAL FIRE would provide the primary emergency response is located approximately 0.70 miles north of the Project Site. The regional CalFire Headquarters is located in Santa Rosa approximately 45 miles from the Project Site. Cal Fire also operates facilities in Gordon Valley (approximately 20 miles away) and has the capabilities of dispatching from the Napa Airport approximately 9 miles away .

The nearest hospital center to the Project Site is Kaiser Permanente Vallejo Medical Center, located at 975 Sereno Drive, Vallejo, CA, about 1.8 miles southwest of the Project Site. This hospital provides walk-in care, urgent care, and emergency services (City of Vallejo, 2024b).

Public Schools

The Project Site is located within the Vallejo City Unified School District (VCUSD). VCUSD currently provides educational services through seven child development centers/preschools, one adult school, 15 elementary and K-8 schools, one middle school, and three high schools (VCUSD, 2024). The school district had a total enrollment of 12,215 students in 2022-2023 (**Appendix A**). The nearest public school to the Project Site is approximately 1.45 miles northwest, Solano Widenmann Leadership Academy, while the nearest schools are New Horizons Montessori School (0.21 miles west) and Solano Community College Vallejo (0.63 miles southeast).

Parks and Recreation

Solano County has four parks, including Beldens Landing, Lake Solano, Lynch Canyon, and Sandy Beach. The parks are located in each of the four corners of the County (Solano County, 2024d), with the closest being Lynch Canyon which is located approximately 2.60 miles northeast of the Project Site. There are 25 parks in the City of Vallejo (Solano County, 2024e). The closest park area to the Project Site is City-operated Dan Foley Park, which is located approximately 0.83 miles to the southwest of the Project Site, followed by Blue Rock Springs, which is located approximately 1.30 miles to the southeast of the Project Site.

NOISE – SECTION 3.11 OF THE EA

Regulatory Setting

Federal

Federal Interagency Committee on Noise

The Federal Interagency Committee on Noise (FICON) provides guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}.

Table 13: Significance of Changes in Noise Exposure

Ambient Noise Level Without Project, L_{dn}	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: Federal Interagency Committee on Noise (FICON)

Federal Transit Administration

The Federal Transit Administration (FTA) establishes quantified vibration level limits and provides guidance for assessing and mitigating impacts associated with transit projects in its Transit Noise and Vibration Impact Assessment Guidelines, 2006.

Table 14: Vibration Levels for Various Construction Equipment

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/Drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/Roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: **Appendix L**

State and Local

Caltrans

Caltrans establishes procedures for evaluating and mitigating traffic noise impacts for transportation projects using Federal Highway Administration (FHWA) Noise Abatement Criteria. Caltrans defines a significant increase due to noise as an increase of 12 dBA over existing ambient noise levels.

City of Vallejo General Plan

The following policies relating to noise and vibration from the City of Vallejo General Plan 2040 may be applicable to the project:

Policy CP-1.14: Healthy Economic Development. No use shall be operated in a manner that produces vibrations discernible without instruments at any point on the property line of the lot on which the use is located.

> **Action CP-1.14A:** Consider developing and adopting a "healthy development checklist" to evaluate potential new development under appropriate criteria, which might include exposure to harmful levels of air pollution, effects on the noise environment, relationship to the active transportation network and the safety of that network, and effects on social cohesion.

Policy NBE-5.13: Noise Control. Ensure that noise does not affect quality of life in the community.

> **Action NBE-5.13A:** Continue to require that new noise-producing uses are located sufficiently far away from noise-sensitive receptors and/or include adequate noise mitigation, such as screening, barriers, sound enclosures, noise insulation, and/or restrictions on hours of operation.

> **Action NBE-5.13B:** Update City regulations to require that parking, loading, and shipping facilities and all associated mechanical equipment be located and designed to minimize potential noise and vibration impacts on residential neighborhoods.

> **Action NBE-5.13C:** Update City regulations to restrict the allowable hours to between 7 AM and 7 PM on weekdays for construction, demolition, maintenance, and loading/unloading activities that may impact noise-sensitive land uses.

> **Action NBE-**5.13D: Require proponents of mixed-use projects to notify potential residents that they may be affected by noise from adjacent/nearby commercial, retail, entertainment, and/or circulation components of the project.

Policy NBE-5.14: Vibration Control. Ensure that vibration does not affect quality of life in the community.

> **Action NBE-5.14A:** Update City regulations to establish quantified vibration level limits similar to commonly used guidelines found in the Federal Transit Administration document "Transit Noise and Vibration Impact Assessment" (2006).

Policy NBE-5.15: Noise Compatibility Standards. Apply the General Plan noise and land use compatibility standards to all new residential, commercial, and mixed-use development and redevelopment.

> **Action NBE-5.15A:** For new single-family residential projects, use a standard of 60 Ldn for exterior noise in private use areas, and require appropriate impact mitigation.

> **Action NBE-5.15B:** For new multi-family residential projects, use a standard of 65 Ldn in outdoor areas, excluding balconies, and require appropriate impact mitigation.

> **Action NBE-5.15C:** For new mixed-use projects that include a residential component, use a standard of 65 Ldn in outdoor areas, excluding balconies, and require the design to minimize commercial noise intrusion into residential areas, including by separating residential areas from noise-generating sources such as

mechanical equipment, entertainment facilities, gathering places, loading bays, parking lots, driveways, and trash enclosures to the extent reasonably feasible.

Action NBE-5.15D: Require maximum interior noise levels at 45 Ldn in all new residential units, and require appropriate impact mitigation.

Action NBE-5.15E: When approving new development, limit project-related noise increases to the following for permanent stationary and transportation-related noise sources:

- No more than 10 dB in non-residential areas;
- No more than 5 dB in residential areas where the with-project noise level is less than the maximum "normally acceptable" level in the Noise and Land Use Compatibility figure; and
- No more than 3 dB where the with-project noise level exceeds the "normally acceptable" level in Noise and Land Use Compatibility figure.

City of Vallejo Municipal Code

The following ordinances from the City of Vallejo Municipal Code for noise and vibration may be applicable to the project:

16.502.08 – Vibration

No use shall be operated in a manner that produces vibrations discernible without instruments at any point on the property line of the lot on which the use is located.

16.502.09 – Noise

C. General Requirements

2. Noise Standards. **Table 15** classifies uses and facilities and establishes exterior and interior noise standards applicable to all uses and facilities in each classification that is not exempt from these requirements pursuant to Subsection B. The requirements impose limits on regularly occurring noise for the specified time periods, averaged over an hour, and do not apply to incidental, infrequent, or unexpected noise, which are subject to Vallejo Municipal Code Chapter 7.84, Regulations of Noise Disturbances. The prohibitions contained in Municipal Code Chapter 7.84, apply to all land uses and activities in the city, and, in the case of a conflict, the more restrictive provisions apply.

Table 15: 16.502-C: Maximum Noise Level by Noise Zone (dBA)

Noise Zoning Districts	Maximum Noise level (level not to be exceeded more than 30 minutes in any hour) Measured at Property Line or District Boundary	Maximum Noise level (level not to be exceeded more than 30 minutes in any hour) Measured at Any Boundary of a Residential Zone	Maximum Noise Level (level not to be exceeded more than 5 minutes in any hour) Between 10 PM and 7AM, Measured at Any Boundary of a Residential Zone
Single-Unit Residential	60	60	--
Multiple-Unit Residential	65	65	--
Commercial and Mixed-Use, Medical, Office	70	60	50 or ambient noise level
Light Industrial	75	65	50 or ambient noise level
General Industrial	75	65	50 or ambient noise level
Public Facilities and Community Use	65	60	50 or ambient noise level
Open Space and Recreational Districts	65	60	50 or ambient noise level

3. The standard limits in **Table 16** shall be adjusted by five decibels for any noise that contains a steady, pure tone such as a whine, screech or hum, or an impulsive sound such as hammering or riveting, or contains music or speech, as described in the following table.

Table 16: 16.502-D: Maximum Noise Level Adjustment by Time and Type

Time and Type of Noise	Adjustment (Decibels)
Any type other than construction and related activities between 7 am and 10 pm	+5
Noise of unusual impulsive character (e.g., hammering or drilling)	-5
Noise of unusual periodic character (e.g., hammering or screeching)	-5

D. Additional Regulations. In addition to the following restrictions, hours may be modified with condition imposed by any conditional use permit or variance. The most restrictive hours shall apply.

1. Construction hours. Construction, demolition, and related loading/unloading activities that may generate noise exceeding levels in **Table 17** shall be limited to hours between 7:00 a.m. and 7:00 p.m. in residential zoning districts and in any mixed-use district.

Table 17: 16.502-E: Maximum Noise Level for Temporary Construction Activity

Time	RR, RLD	RMD, RHD, NMX, NC	Commercial (including medical and office) and industrial
Mobile Construction equipment – non-scheduled, intermittent, and short term for less than 15 days			
Weekdays 7 a.m. to 6 p.m.	75 dBA	80 dBA	85 dBA
Saturdays 9 a.m. to 6 p.m.	60 dBA	65 dBA	70 dBA
Sundays and legal holidays	None	None	None
Stationary construction equipment			
Weekdays 7 a.m. to 6 p.m.	60 dBA	65 dBA	70 dBA
Saturdays 9 a.m. to 6 p.m.	60 dBA	65 dBA	70 dBA
Sundays and legal holidays	None	None	None

Environmental Setting

Acoustical Background and Terminology

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60-dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 18 lists several examples of the noise levels associated with common situations.

Table 18: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	100	
Gas Lawn Mower at 1 m (3 ft.)	90	
Diesel Truck at 15 m (50 ft.), at 80 km/hr. (50 mph)	80	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	70	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	60	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	50	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September 2013

The effects of noise on people can be placed into three categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regards to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate.

Vibration Background and Terminology

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table X, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

The threshold for architectural damage to structures is 0.20 in/sec p.p.v. A threshold of 0.20 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

Table 19: Effects of Vibration on People and Buildings

Peak Particle Velocity (mm/second)	Peak Particle Velocity (in/second)	Human Reaction	Effect on Buildings
0.15 – 0.20	0.006 – 0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10 - 15	0.4 – 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Transportation Related Earthborne Vibrations. Caltrans. TAV-02-01-R9601. February 20, 2002

Sensitive Receptors

Some land uses are considered more sensitive to noise than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, schools, libraries, hospitals, and passive recreation areas generally are more sensitive to noise than commercial or industrial land uses. Sensitive noise receptors may also include threatened or endangered noise-sensitive biological species. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

HAZARDOUS MATERIALS AND HAZARDS– SECTION 3.12 OF THE EA

Regulatory Setting

Federal

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) regulates the land disposal of hazardous materials from cradle-to-grave. This means establishing a regulatory framework for the generation, transport, treatment, storage and disposal of hazardous waste. Specifically, Subtitle D of RCRA pertains to non-hazardous solid waste and Subtitle C focuses on hazardous solid waste. A solid waste can consist of solids, liquids and gases, but these must be discarded in order to be considered waste. Additionally, the USEPA has developed regulations to set minimum national technical standards for how disposal facilities should be designed and operated. States issue permits to ensure compliance with USEPA and state regulations. The regulated community is comprised of a diverse group that must comprehend and adhere to RCRA regulations. These groups can consist of hazardous waste generators, government agencies, small businesses, and gas stations with underground petroleum tanks.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is designed to investigate and clean up sites contaminated with hazardous substances. Sites managed under this program are referred to 'Superfund sites.' CERCLA (1) established prohibitions and requirements concerning closed and abandoned hazardous waste sites, (2) provided for liability of persons responsible for releases of hazardous waste at these sites; and (3) established a trust fund to provide for cleanup when no responsible party could be identified. Under CERCLA, the USEPA seeks to identify parties responsible for releases of hazardous substances into the environment and either compel them to clean up the sites or undertake the cleanup on its own and seek to recover those costs from the responsible parties through settlements or other legal means. CERCLA authorizes the USEPA to undergo two different types of response actions: (1) short-term removals, which may address releases or threatened releases requiring prompt response, and (2) long-term remedial response actions, that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on the USEPA's National Priorities List.

Food, Drug, and Cosmetic Act

Under the federal Food, Drug, and Cosmetic Act, the USEPA sets maximum residue limits, or tolerances, for pesticides residues on food. When the USEPA sets a tolerance level for a food, this is the level deemed safe. In defining safe, this means that, "reasonable certainty that no harm will result from aggregate exposure to the pesticide residue." When determining a safety finding for a tolerance level, the USEPA considers the toxicity of the pesticide and its break-down products, aggregate exposure to the pesticide in foods and from other sources of exposure if applicable, and any special risks specific to infants and children. If a tolerance is not set for a pesticide residue, a food containing that pesticide residue will be subject to government seizure if deemed appropriate. However, once a tolerance has been established for a pesticide residue, then residue levels below the tolerance will not trigger enforcement actions. If the residue level is detected above that tolerance, then the commodity will be subject to seizure. Some pesticides do not have a set tolerance level as the USEPA may grant exemptions in the cases where the pesticide residue does not pose, under foreseeable situations, a significant dietary risk.

Insecticide, Fungicide, and Rodenticide Act

The federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) addresses the sale, distribution, and labeling of pesticides, as well as the certification and training of pesticide applicators. FIFRA establishes recordkeeping and reporting requirements on certified applicators of restricted use pesticides. Furthermore, FIFRA imposes storage, disposal, and transportation requirements on registrants and applicants for the registration of pesticides. Pesticide use is regulated through requirements to apply pesticides in a manner consistent with the label. The labeling requirement includes directions for use, warnings, and cautions along with the uses for which the pesticide is registered (e.g., pests and appropriate applications). This includes the specific conditions for the application, mixture, and storage of the pesticide. Additionally, the label must specify a time period for re-entry into an area after the pesticide has been applied, and when crops may be harvested after the application of the pesticide. If a pesticide is used in a manner contrary to specifics on its label, then the use constitutes a violation of the FIFRA.

Hazardous Communication Standard

The Occupational Safety and Health Administration helps ensure employee safety by regulating the handling and use of chemicals in the workplace. For instance, it administers the Hazard Communication Standard (HCS). The HCS ensures safety in the workplace concerning chemicals through requiring information to be provided and understood by workers about the identity and hazards associated with chemicals they may work with. This also requires that chemical manufactures and importers evaluate the hazards associated with the chemicals they create or import, and that these chemicals have proper labels and material safety data sheets concerning their hazards to others (e.g., customers). Downstream of the production, employers who utilize these hazardous chemicals in their workplaces are obligated to have labels and safety data sheets for their workers and to train them on the proper handling of these chemicals.

Hazardous Substances Act

The Consumer Product Safety Commission has a limited role in regulating hazardous substances; it primarily deals with the labeling of consumer products through the federal Hazardous Substances Act (HSA). HSA only requires products that may at some point be in the presence of people's dwellings to be labeled, including during purchase, storage, or use. These labels must alert consumers of the potential hazards that the product may pose. However, in order for a product to be required for labelling, the product must be toxic, corrosive, flammable/combustible, an irritant, a strong sensitizer, or have the ability to generate pressure through decomposition, heat, or other means. Furthermore, the product must possess the ability to cause severe personal injury or substantial illness during or as a result of any customary or reasonably predictable handling or use, including reasonably foreseeable ingestion by children.

Toxic Substances Control Act

The federal Toxic Substances Control Act (TSCA), as amended by the Frank R. Lautenberg Chemical Safety for the 21st Century Act, permits the USEPA to evaluate the potential risk from novel and existing chemicals and address unacceptable risks chemicals may have on human health and the environment. The USEPA oversees the production, importation, use, and disposal of certain chemicals. This includes the USEPA having the authority to require record keeping, reporting, and test requirements and restrictions associated with certain chemical substances and/or mixtures. However, certain groups of chemicals are excluded from TSCA consideration, including—but not limited to—food, drugs, cosmetics and pesticides. Examples of chemicals included in TSCA consideration are lead paint, asbestos, mercury, formaldehyde, and polychlorinated biphenyls.

Emergency Planning and Community Right-to-Know Act

The federal Emergency Planning and Community Right-to-Know Act (EPCRA) is designed to assist local communities protect public health, safety, and the environment from chemical hazards. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. The EPCRA also requires industry to report on the storage, usage, and releases of hazardous substances to federal, state, and local governments, and states and communities can use the information gained to improve chemical safety and protect public health and the environment.

National Fire Protection Association Codes and Standards

The National Fire Protection Association (NFPA) publishes more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks, including, but not limited to (NFPA, 2022):

- NFPA 13 Standard for the Installation of Sprinkler Systems

- NFPA 72 National Fire Alarm and Signaling Code
- NFPA 88A Standard for Parking Structures
- NFPA 1660 Standard for Emergency, Continuity, and Crisis Management: Preparedness, Response, and Recovery
- NFPA 1140 Standard for Wildland Fire Protection

State and Local

California Air Resource Board

The California Air Resource Board's Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations, adopted in 2001, mandates the use of best available dust mitigation measures in specified activities where naturally occurring asbestos is present or likely to be found. The ATCM applies to construction, grading, quarrying, and surface mining operations in areas with ultramafic rock or serpentine. It requires air pollution control districts to enforce these measures or propose their own, ensuring activities comply with regulations to minimize asbestos exposure and protect air quality

California Department of Forestry and Fire Protection (CalFire)

California Department of Forestry and Fire Protection (CalFire) is responsible for protecting natural resources from fire on land designated as within the State Responsibility Area (SRA). Public Resources Code 4201-4204 specifies that lands within SRAs be classified into fire hazard severity zones. These zones are classified based on fuel loading, slope, fire weather, wind, and other relevant factors. CalFire protects over 31 million acres of California's wildlands and provides emergency services in 36 of the state's 58 counties.

Solano County General Plan Public Health and Safety Chapter

The Solano County General Plan Public Health and Safety Chapter contains goals, objectives, and policies to provide protection from wildland fire hazards. The County developed fire safety policies and programs to align with its vision of balancing human and environmental needs. While maintaining natural fire ecology benefits the environment, it can also cause significant harm to people and property. To achieve a sustainable balance, the County aims to direct development away from high-risk fire zones and mitigate the impact of wildfires on developed areas (Solano County, 2015). To meet this objective the following policies are outlined:

> **Policy HS.P-20**: Require that structures be built in fire defensible spaces and minimize the construction of public facilities in areas of high or very high wildfire risk.
>
> **Policy HS.P-22**: Require new developments in areas of high and very high wildfire risk to incorporate fire-safe building methods and site planning techniques into the development.

The Solano County Multijurisdictional Hazard Mitigation Plan (MHMP) was last updated in 2022 and defines measures to reduce risks from natural disasters, including wildfire, in Solano County. The plan complies with federal and state hazard mitigation planning requirements to establish eligibility for funding under Federal Emergency Management Agency (FEMA) grant programs for all planning partners.

The MHMP identifies that home loss in wildland fires is primarily driven by two equally important factors: 1) the vulnerability of buildings that make them prone to ignition, and 2) The vegetative fuels within 100 feet of structures (the area referred to as defensible space). Mitigating large-scale loss of life and property can be achieved through using relatively well-established techniques of home hardening, defensible space, and vegetation management at the scale of whole communities and the natural landscapes that surround them.

Solano County Emergency Operations Plan

The Solano County Emergency Operations Plan (EOP; Solano County, 2024) is designed to ensure coordinated efforts among agencies and jurisdictions within Solano County to protect life, property, and the environment during disasters. Aligning with California's Standardized Emergency Management System (SEMS), this Plan establishes a framework for a unified response during emergencies, providing stability and coordination.

Emergency response operations within the Operational Area are directed by hazard- and sector-specific Standard Operating Procedures (SOPs), which are created and maintained by partner agencies typically responsible for those emergencies. These SOPs, often included as annexes, are regularly updated by the relevant departments and agencies. Some key annexes include:

The Functional Annex, which details strategies, procedures, and organizational structures for managing large-scale evacuations in Solano County (Solano County, 2024).

This EOP was developed under the guidance of the Solano County Office of Emergency Services to create a comprehensive approach to handling extraordinary incidents, including natural, technological, and human-caused emergencies, as well as large events requiring coordinated responses. It adheres to SEMS, the National Incident Management System (NIMS), and relevant local and state laws, and aligns with standards from FEMA and the California Governor’s Office of Emergency Services (Cal OES).

The plan establishes an emergency management structure outlining the roles and responsibilities of government organizations and connects local, state, federal, and private resources for emergency support. Developed with the cooperation of various County departments and agencies, all Solano County departments, offices, and employees are expected to comply fully with the actions detailed in the plan. This EOP applies to all agencies and individuals involved in emergency preparedness, response, recovery, and mitigation in unincorporated areas of the county. Incorporated cities within the county are responsible for maintaining their own EOPs in line with the policies and procedures of this plan.

Solano County Community Wildfire Protection Plan

The Solano County Community Wildfire Protection Plan (SCCWPP) addresses wildfire risks to protect human life and property. It assesses wildfire risks countywide, uniting stakeholders involved in wildfire management. The SCCWPP serves as a comprehensive assessment of wildfire risk across the County's diverse landscapes. It involved collaborative modeling and mapping of fire behavior, vegetative fuels, topography, and exposure to pinpoint areas of highest risk. A substantial portion of western Solano County was categorized as high or extreme risk due to the rugged terrain, wildland vegetation, and wildland-urban interface locations.

By identifying gaps and deficiencies, the SCCWPP provides a framework for future planning and mitigation, including actionable projects. Developed by a team of federal, state, and local agencies, and community organizations, the Plan involved modeling and mapping wildfire risks, identifying hazards, and incorporating public input through meetings, surveys, and workshops. It aligns with the wildfire-specific actions in the Mitigation Action Plan of the Solano County Multi-Jurisdictional Hazard Mitigation Plan (Solano County, 2023). The SCCWPP provides a collaborative framework for wildfire management.

The SCCWPP emphasizes that shared responsibility between governments and the public is key to effectively reduce Solano County's growing wildfire risk driven by climate change and other factors. The safe and efficient evacuation from wildfire involves several factors, including the implementation of public alerts and warning systems. Solano County has implemented a countywide emergency notification system in cooperation with its municipalities. The Alert Solano Emergency Notification System allows residents to register phone numbers and emails to receive alerts. This allows county and municipal emergency agencies to rapidly communicate information regarding severe weather and disasters, evacuation notices, road closures, and any other relevant emergency information additional information can be found in the MJHMP.

City of Vallejo General Plan 2040

The City of Vallejo General Plan is a state-mandated, long-range planning document that guides land use policies and physical development in California municipalities. Propel Vallejo: General Plan 2040 directs future changes within Vallejo and its Sphere of Influence, addressing city-wide issues and trends for the next 25 years, ensuring policy consistency (City of Vallejo, 2017).

Nature and Built Environment Element

The General Plan is the City's primary land use regulatory tool and outlines the steps needed to achieve the community's vision for the future. The Nature and Built Environment Element includes goals, policies, and actions relating to five key goals: Beautiful City, A Place Where People Want to Be, Pride in Identity, Iconic Waterfront, and Hazard Protection.

Goal NBE-1: Hazard Protection: Protect life and property from natural and human-made hazards.

> **Policy NBE-5.4**: Project Location and Design. Prohibit development in any area where it is determined that the potential risk from natural hazards cannot be mitigated to acceptable levels.
>
>> **Action NBE-5.4C:** Continue to use the development review process to ensure that development is planned and constructed to resist the encroachment of uncontrolled fire.
>
> **Policy NBE-5.10:** Site Safety. Ensure that affected soil, groundwater, or buildings will not have the potential to adversely affect the environment or the health and safety of site occupants.
>
>> **Action NBE-5.10A:** Continue to require remediation of hazardous material releases from previous land uses as part of any redevelopment activities.
>>
>> **Action NBE-5.10B:** Continue to require environmental site assessments stipulated by State and County regulations for potential hazardous material releases from prior uses and assessments for lead and asbestos present in building materials.
>
> **Policy NBE-5.11:** Risk Reduction. Reduce the risk of hazardous materials accidents, spills, and vapor releases, and minimize the effects of such incidents if they occur.
>
>> **Action NBE-5.11A:** Continue to require the preparation of Hazardous Materials Business Plans for new uses that will handle hazardous materials, including inventory of materials by type, quantities, and conditions of storage and transportation, assessment of potential hazards associated with the materials, and steps to be taken to minimize risks and in the event of a spill.

Environmental Setting

Phase I Environmental Site Assessment

Methodology

Under the American Society for Testing and Materials (ASTM) Standard Practice E 1527-21, RECs are defined as the presence or probable presence of any petroleum products or hazardous substances in, on, or at a property due to one or more of the following conditions:

- a release into the environment,
- signs indicative of a release to the environment, or
- circumstances that pose a material threat of a future release to the environment.

The Phase I ESA was prepared in accordance with the ASTM Standard Practice E 1527-21, and USEPA Final Rule regarding Standards and Practices for All Appropriate Inquiries (40 CFR Regulations Part 312). In addition to RECs, the Phase I ESA assessed Historical RECs (HRECs) and Controlled RECs (CRECS). The Phase I ESA conducted historical research that included reviewing aerial photographs and topographical maps, interviews, a site reconnaissance of accessible areas on the Project Site occurred on September 9, 2022, and a database review that included regulatory, State, and local databases entries up to a one-mile radius of the Project Site (**Appendix M-1**).

In addition, the Phase I ESA conducted historical research that included reviewing aerial photographs and topographical maps, interviews, a site reconnaissance of accessible areas on the Project Site, and a database review. The site reconnaissance visit occurred on September 9, 2022. The database review included regulatory, state, and local databases up to a one-mile radius surrounding the Project Site. The property owner was interviewed regarding the past and current use of the Project Site, and similarly did not report any RECs, HRECs, or CRECs relative to hazardous materials, hazardous waste, or chemical use, storage, or disposal (**Appendix M-1**).

Results and Recommendations

The Phase I ESA concluded that no RECs, Historical RECs (HRECs), or Controlled RECs (CRECs) were connected with the Project Site and none were observed during the Phase I site visit. The observations and recommendations of the Phase 1 ESA are summarized below and described in more detail in **Appendix M-1**:

- A serpentine mine existed in the central portion of the property in the past;
- There is a monitoring well for Per- and Polyfluoroalkyl Substances (PFAS) on-site; and
- St. John's Mine, an inactive mercury mining operation approximately 1 mile northeast of the property, was active until 1923 (Bowen, 2004).

None of the listed sites in the vicinity were considered able to affect the Project Site and ultimately the regulatory records did not reveal any RECs, HRECs, or CRECs. Despite the absence of RECs, HRECs, and CRECs, the Phase I ESA recommended additional testing for thorough due diligence given the site's history of mining activity. The Phase I ESA made the following recommendations based on the findings and conclusions:

- Ground-disturbing activities occurring on the Project Site should follow a dust control plan;
- Mine tailings piles should be tested to ensure that no toxic substances are contained therein; and
- Monitoring well data should be reviewed as part of project planning.

Naturally Occurring Asbestos

During the preliminary geotechnical exploration, silica-carbonate rock was identified as part of the Jurassic-age Coast Range Ophiolite sequence, which includes other ultramafic rocks such as basalt, gabbro, and serpentinite (**Appendix D**). Serpentinite can include naturally occurring asbestos (NOA), particularly within the mineral chrysotile. Asbestos is the name for a group of naturally occurring silicate minerals. Exposure to friable asbestos may result in inhalation or ingestion of asbestos fibers, which over time may result in damage to the lungs or membranes that cover the lungs, leading to illness or even death. When material-containing NOA is disturbed, the asbestos fibers can become airborne, thereby creating a potential health hazard. NOA can became airborne due to natural causes (e.g., weathering, erosion) or human activities (e.g., grading, cracking/crushing of rock that contains NOA). Since 1986, the California Air Resources Board (CARB) has recognized asbestos as a Toxic Air Contaminant. CARB regulates construction, grading, and other activities that can cause NOA to become airborne.

Wildfire

Terminology

The terms wildfire hazard and wildfire risk are often used incorrectly and interchangeably, or even combined to create the term “wildfire hazard risk.”

State Responsibility Areas (SRAs) are recognized by the California State Board of Forestry as areas where the California Department of Forestry and Fire Protection (CalFire) is the primary emergency response agency responsible for fire suppression and prevention. PRC Section 4202 requires the State Fire Marshal to classify lands within SRAs into fire hazard severity zones (FHSZs). The FHSZs that are published by CalFire describe the ***wildfire hazard***, which is the likelihood of a wildland fire occurring at a location and the potential intensity at which it will occur. Wildfire hazards throughout SRAs are designated by consideration of factors such as wildland fuels, terrain, and weather. Wildland fuels, primarily vegetation, are the main drivers of wildfire combustion.

The term ***wildfire risk*** describes the wildfire hazard along with the factors that contribute to the susceptibility of an area to wildfire damage, or the impact wildfire may have on what are considered highly valued resources and assets. The wildfire risk combines the likelihood of ignitions and intensity of a fire (the components that make up the hazard) and factors in the susceptibility of the built environment. As an example, an extremely remote forest with many dead trees but no roads or homes may have a high wildfire hazard, but in the absence of structures the overall wildfire risk in the area may be lower than a similar forest with numerous scattered homes.

Evacuation Notification, Routes, and Zones

The Solano County Emergency Operations Plan (EOP) Protective Actions and Transportation Coordination annexes outline the strategies, procedures, and organizational structures to be used in managing coordinated, large-scale evacuations in Solano County. As described therein, the nature and timing of evacuation orders for a particular event are based on several considerations, including the nature and severity of the impact, area affected and likely to be affected, expected duration of the incident, number of people to be evacuated, time available for evacuation, and impediments to and capacity of evacuation routes.

The safe and efficient evacuation from wildfire involves several factors, including the implementation of public alerts and warning systems. Solano County has implemented a countywide emergency notification system in cooperation with its municipalities. The Alert Solano Emergency Notification System allows residents to register phone numbers and emails to receive alerts. This allows county and municipal emergency agencies to rapidly communicate information regarding severe weather and disasters, evacuation notices, road closures, and any other relevant emergency information additional information can be found in the MJHMP.

Interstate 80 (I-80) and State Route 37 (SR-37) are identified as two major regional transportation corridors that may be used in an evacuation. The Project Site is located in Evacuation Zone VLJ-1138. Evacuation Zones SOL-3190 and NPA-E259, are north of the Project Site and are largely undeveloped open space. Evacuation Zones VLJ-1120 and SOL 3192 are to the east of the Project Site and Zone VLJ-1120 contains a residential neighborhood. The mixed commercial-residential areas to the south are located in Evacuation Zones VLJ-1166, VLJ-1136, VLJ-1162, and VLJ-1134. The Solano County Fairgrounds to the southwest of the Project Site is its own Evacuation Zone (SOL-3208). The west side of I-80 west of the Project Site includes Evacuation Zones VLJ-1114, VLJ-1116, and VLJ-1118.

VISUAL RESOURCES – SECTION 3.13 OF THE EA

Regulatory Setting

State and Local

City of Vallejo General Plan

The City of Vallejo's General Plan addresses visual resources by providing guidelines and policies aimed at preserving and enhancing the city's aesthetic and scenic qualities. These policies focus on protecting significant views, maintaining the character of neighborhoods, and ensuring new developments are visually harmonious with their surroundings.

The Vallejo General Plan Nature and Built Environment Element contains goals, policies and actions designed to enhance the natural and urban environment in Vallejo and the Planning Area.

Goal CP-1: Healthy Community: Promote the health of all Vallejoans.

> **Policy CP-1.7**: Green Space. Promote community physical and mental health through provision and preservation of the urban forest, natural areas, and “green” infrastructure (i.e. best practices water management).
>
> > **Action CP-1.7C**: Support efforts by stewardship agencies to preserve wetland and open space areas.

Goal NBE-1: Preserve and enhance the natural, historic, and scenic resources that make Vallejo special.

> **Policy NBE-1.5**: Scenic Vistas. Protect and improve scenic vistas, including views from Interstate 80 and State Route 37 in Vallejo.
>
> > **Action NBE-1.5A**: Identify existing scenic vistas and update City regulations to specify requirements for protection of existing scenic vistas.
> >
> > **Action NBE-1.5B**: Update City regulations for development within view of freeways in Vallejo.

Action NBE-1.5C: Continue to administer the residential view district regulations intended to preserve panoramic views of the surrounding natural and human-made environment from residential neighborhoods located on hills.

Policy NBE-1.6: Open Space. Conserve and enhance natural open space areas in and adjacent to Vallejo and its waterfront.

Action NBE-1.6B: Identify lands in Vallejo that provide connections for animals between open spaces and/or important habitat, and assist conservation agency efforts to acquire land and/or establish easements that facilitate wildlife movement.

Goal NBE-2: A Place Where People Want to Be: Establish Vallejo as an attractive place to live, work, shop, and enjoy time off

Policy NBE-2.1: Strengthen Local Identity. Focus future growth to foster a vibrant Downtown/Waterfront District, strong job centers, comfortable neighborhoods, thriving neighborhood corridors and urban villages, and retail/entertainment clusters that draw visitors from the city and the region.

Action NBE-2.1A: Use the development review process, as appropriate, to facilitate attractive, creative development.

Policy NBE-2.3: Inviting, Compatible Design. Promote attractive development that is compatible with surrounding uses.

Action NBE-2.3A: Continue to utilize development approval conditions to achieve compatibility between nearby uses and scale and style of buildings, and to establish limitations on activities that could create potential adverse effects.

City of Vallejo Title 16: Zoning Code

The City of Vallejo Zoning Code contains development criteria for new construction within the city that emphasizes the preservation of scenic views and the minimization of visual impacts from new development. This includes regulations on building heights, setbacks, and design standards that maintain the visual character of the area.

Additionally, the City of Vallejo Zoning Code includes the following lighting and glare development standards, intended to maintain adequate visibility and safety, conserve energy, and protect against direct glare and excessive lighting.

Chapter 16.506 – Lighting and Glare

16.506.04 – General Requirements

A. All outdoor lighting on private property includes light fixtures attached to buildings, structures, poles, or self-supporting structures. Exterior lighting may be found on parking lots, walkways, building entrances, outdoor sales areas, landscaping, recreational fields, and building faces.
B. Lighting shall be designed, located, and installed to be directed downward or toward structures, be shielded or fully shielded, and shall be well-maintained in order to prevent glare, light trespass (unwanted light on adjacent lots and public rights-of-way), and light pollution to the maximum extent

feasible. No permanently installed lighting shall blink, flash, or be of unusually high intensity or brightness, as determined by the director.

C. Maximum Height. Outdoor light standards shall not exceed the following maximum heights:
   1. Residential Zoning Districts: seventeen feet
   2. Non-Residential Zoning Districts (excluding Industrial Zoning Districts: twenty feet
   3. Industrial Zoning Districts: twenty-five feet
   4. Non-Residential within twenty feet of a residential zoning district or use: seventeen feet.

D. Timing. All outdoor lighting in non-residential zoning districts shall be turned off during daylight hours and during any hours when the building is not in use and the lighting is not required for security. Time clocks or photo-sensor systems may be required as a condition of approval of a discretionary permit.

E. Energy Efficiency. Outdoor lighting shall use energy-efficient fixtures/lamps. Examples of energy efficient fixtures/lamps include high pressure sodium, hard-wired compact florescent, or other lighting technology that is of equal or greater energy efficiency.

F. For safety and security, during business hours, all areas having frequent vehicular and pedestrian traffic shall be equipped with a lighting device providing a minimum one-foot candle of light at ground level during the hours of darkness.

G. Design of Fixtures. Fixtures shall be appropriate to the style and scale of the architecture and be shielded as required by Paragraph (I) below. The top of the fixture shall not exceed the height of the parapet or roof or eave of roof.

H. Entrances in Multi-Unit Residential Development. All entrances to multi-unit residential buildings containing more than four units shall be lighted with low intensity fixtures to ensure the safety of persons and the security of the building.

I. Shielding. Lighting fixtures shall be shielded or recessed to reduce light bleed to adjoining properties, by:
   1. Ensuring that the light source (e.g., bulb, etc.) is not visible from off the site; and
   2. Confining glare and reflections within the boundaries of the site to the maximum extent feasible.
   3. Each light fixture shall be directed downward and away from adjoining properties and public rights-of-way, so that no on-site light fixture directly illuminates an area off the site.
   4. Lighting on private property shall not produce an illumination level greater than one foot-candle on any property within a residential zoning district except on the site of the light source.
   5. All nonexempt outdoor lighting fixtures shall be shielded to meet standards in **Table 20**.

J. Total Outdoor Light Output Standards. Total non-exempt outdoor light output shall not exceed the limits in **Table 21**. Lighting used for external illumination of signs is counted, while lighting used for internal illumination of signs is not counted.

Table 20: 16.506-A: Lamp Type and Shielding Standards

Use Class and Lamp Type	DMX, WMX, CC, RC, IL, IG	RMD, RHD, NMX, NC, WC, WMX, O, M, PS	RR, RLD, PROS, and RCN
Class 1 Lighting (Color Rendition)			
Initial output greater than or equal to 2,000 lumens	F	F	F
Initial output below 2,000 lumens	A	A	A
Class 2 Lighting (General Illumination			
Initial output greater than or equal to 2,000 lumens	F	F	F
Initial output below 2,000 lumens	A	A	A
Class 3 Lighting (Decorative)			
Initial output greater than or equal to 2,000 lumens	F	F	X
Initial Output below 2,000 lumens	A	A[2]	F
Residential Lighting (all Classes)	F	F	F
Initial output greater than or equal to 3,000 lumens	F	F	F
Initial output below 3,000 lumens	A	A	A[2]

Use Codes: A = all types of fixtures allowed; shielding not required but highly recommended, except that any spot or floodlight shall be aimed no higher than 45 degrees above straight down F = only fully shielded fixtures allowed X = not allowed

Table 21: 16.506B: Maximum Total Outdoor Light Output Standards

Lumen Caps – Initial LANP Lumens Per Net Acre	Lighting Zones: DMX, WMX, CC, RC, IL, IG, LZ 3	Lighting Zones: RMD, RHD, NMX, NC, WC, WMX, O, M, PS, LZ 2	Lighting Zones: RR, RLD, PROS, and RCN, LZ 3
Commercial and Industrial Zoning			
Total (fully shielded and unshielded)	200,000	100,000	50,000
Unshielded only	10,000	10,000	4,000
Residential and Mixed-Use Zoning			
Total (fully shielded and unshielded)	20,000	10,000	10,000
Unshielded only	5,000	5,000	1,000

1. Outdoor light fixtures installed on poles (such as parking lot luminaries) and light fixtures installed on the sides of buildings or other structures, when not shielded from above by the structure itself are to be included in the total outdoor light output by simply adding the initial lumen outputs of the lamps.
2. Outdoor light fixtures installed under canopies, buildings (including parking garage decks), overhangs or roof eaves where all parts of the lamp or luminaire are located at least five feet but less than ten feet from the nearest edge of the canopy or overhang are to be included in the total outdoor light output as though they produced only one-quarter (0.25) of the lamp's rated initial lumen output.

3. Outdoor light fixtures installed under canopies, buildings (including parking garage decks), overhangs, or roof eaves where all parts of the lamp or luminaire are located at least ten feet but less than thirty feet from the nearest edge of the canopy or overhang are to be included in the total outdoor light output as though they produced only one-tenth (0.10) of the lamp's rated initial lumen output.
4. Outdoor light fixtures installed under canopies, buildings (including parking garage decks), overhangs, or roof eaves where all parts of the lamp or luminaire are located thirty or more feet from the nearest edge of the canopy or overhang are not to be included in the total outdoor light output.

K. Maintenance. Fixtures and lighting shall be maintained in good working order and in a manner that serves the original design intent.

Dark-Sky Association's Model Lighting Ordinance

The International Dark-Sky Association and the Illuminating Engineering Society of North America have developed a Model Lighting Ordinance to address the need for strong, consistent outdoor lighting regulation in North America (IDA, 2011). The purpose of the Model Lighting Ordinance is to provide regulations for outdoor lighting that will:

- Permit the use of outdoor lighting that does not exceed the minimum levels specified in Illuminating Engineering Society recommended practices for night-time safety, utility, security, productivity, enjoyment, and commerce;
- Minimize adverse offsite impacts of lighting such as light trespass, and obtrusive light;
- Curtail light pollution, reduce skyglow and improve the nighttime environment for astronomy;
- Help protect the natural environment from the adverse effects of night lighting from gas or electric sources; and
- Conserve energy and resources to the greatest extent possible.

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Appendix F

Alternatives Eliminated from Consideration

Alternatives Considered but Eliminated from Further Consideration

During the NEPA process, federal agencies are required to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources” (NEPA Section 102(2)(H)). The Council on Environmental Quality (CEQ) indicates that what constitutes a “reasonable range” of alternatives depends on the nature of the proposal and the facts in each case (CEQ, 1986), and that “[r]easonable alternatives means a reasonable range of alternatives that are technically and economically feasible, and meet the purpose and need for the proposed action” (1508.1(z)).

Alternatives other than the No Action/No Development Alternative were screened based on five criteria: 1) extent to which they meet the purpose and need for the Proposed Action; 2) feasibility from a technical and economic standpoint; 3) feasibility from a regulatory standpoint (including ability to meet the requirements for establishing connections to newly acquired lands for the purposes of the “restored lands”); 4) ability to avoid or minimize environmental impacts; and 5) ability to contribute to a reasonable range of alternatives.

The EA fully analyzes the Tribe’s Proposed Project (Alternative A), a Reduced-Intensity Alternative (Alternative B) and a Non-Gaming Alternative (Alternative C). Both on-site and off-site options are considered for water and wastewater under each alternative. Alternative A consists of the transfer of the 160-acre Project Site into federal trust status for the benefit of the Tribe for gaming purposes (Proposed Action) and the subsequent development by the Tribe of a casino facility, Tribal housing, Tribal administration building, and associated parking and infrastructure on the Project Site. Alternative B is similar to Alternative A, except that the Tribal housing and Tribal administration component would not be built. Alternative C includes the development by the Tribe of a commercial center, two hotels, Tribal housing, and Tribal administration building.

Additional alternatives considered but rejected from full analysis are listed in **Table 1**. These alternatives were eliminated because they did not meet the established screening criteria.

Table 1: Alternatives Considered but Eliminated from Further Consideration

Alternative	Reason for Elimination from Consideration
Alternative configurations of the Tribe's Proposed Project	The Proposed Project has been designed and sited on the project site with consideration of several development constraints. Various configurations have been considered since at least 2016, when an initial site plan was submitted with the Tribe’s fee-to-trust application. The site plan considered a larger development footprint than what is currently proposed and has been reduced over time based on the following constraints: • Development in the southwestern corner of the project site is limited by an existing easement which reduces the developable area of the site.

Alternative	Reason for Elimination from Consideration
	• A 1.6-acre freshwater marsh wetland is located on the southern portion of the project site. In order to reduce environmental impacts, most or all of the wetland is proposed to be avoided. • Due to steep slopes and landslides the development footprint of the Proposed Project has been modified over time. Mapping of topography and landslides is included in EA Appendix D and Appendix C. • Development in the northeastern portion of the site is limited by biological constraints. Biological constraints in this area include critical habitat, Callippe silverspot butterfly host plant habitat, and California rare plant Jepson's leptosiphon (*Leptosiphon* jepsonii) habitat. Mapping of these constraints is included in EA Appendix H-3 and Appendix H-1. The Tribe considered developing the casino facility on the southeastern portion or the project site (Assessor's Parcel Number 0182020020); however, an adequate setback from an existing landslide could not be accommodated. Mapping of landslides is included in EA Appendix D. Alternative configurations within the proposed development area (e.g., swapping the location of the casino building and Tribal housing would have substantially similar environmental impacts in comparison to the Proposed Project. Consequently, alternative configurations would not avoid or minimize environmental impacts or contribute to a reasonable range.
Reduced Casino Size Alternative	As discussed above, the area for development is limited due to steep slopes, landslides and biological constraints. Due to these factors, the casino, parking, and other uses are combined into one eight-story building. A similar footprint would be required to accommodate an economically viable reduced casino alternative in order to accommodate parking, amenities, and back-of-house facilities. The size of the gaming component is consistent with regional market factors as discussed in the Market Study, EA Appendix A. Thus, reducing the size of the casino component would not avoid or minimize environmental impacts or contribute to a reasonable range.
An on-site alternative that develops more housing than the Proposed Project	Various configurations of development were considered including the development of more than 100 Tribal homes on the project site. Due to topographic constraints, landslides, and biological constraint, the housing component was reduced in size. Biological constraints include critical habitat, Callippe silverspot butterfly host plant habitat, and California rare plant Jepson's leptosiphon (*Leptosiphon* jepsonii) habitat north and east of the proposed housing site.
Off-Site Alternatives	Sugar Bowl Rancheria. In 1911, the United States acquired a small parcel of land for Scotts Valley known as the Sugar Bowl Rancheria. Scotts Valley continued to hold that land until 1958, when Congress enacted the California Rancheria Termination Act, Pub. L. No. 85–671, 72 Stat. 619 (1958), which terminated both the federal trust relationship with the Tribe as well as the reservation status of the Sugar Bowl Rancheria. Nearly all of this land has passed to non-Indian

Alternative	Reason for Elimination from Consideration
	ownership. Today, there is less than ½ acre of the original Rancheria left and it is held as an allotment by a tribal member. 29.9-Acre Contra Costa County Site. The Tribe went through a lengthy National Environmental Policy Act (NEPA) process which began in 2004 with a Notice of Intent to prepare an Environmental Impact Statement for a proposed casino project on a 29.9-acre site in Contra Costa County, contiguous with the City of Richmond. A Draft EIS was released in 2006 and a Final EIS was released in 2007. In 2012, the Assistant Secretary – Indian Affairs and the Solicitor determined that the site would not qualify as Restored Lands. 33.5-Acre Lake County Fee Site. The site consists of one individual parcel (APN 009-021-07) and is located immediately southeast of the Highway 29 and Soda Bay/Red Hills Road intersection. The site is located within unincorporated Lake County approximately 2.75 miles south of the South Shore of Clear Lake, and less than ten miles away from the communities of Kelseyville, Lower Lake, and the City of Clear Lake. Regional access to the site is provided by Highway 20, Highway 29, and Highway 53. The site was considered as an alternative but eliminated from consideration as discussed in the 2007 Final EIS. The Lake County site was acquired with funding from the HUD for residential and other Tribal purposes (administration, recreation, etc.) The Tribe intends to expand the residential potential on the site. Other Properties. Consideration of a highly speculative circumstance under which the Tribe would be able to purchase an alternative site that could be developed with an economic enterprise with which to fund the tribal government would not aid in expanding the range of alternatives in a manner that promotes informed decision-making. Consideration of such an alternative would speculate that the Tribe would be able to purchase said site, and that the financial benefits of developing such a site would accomplish the purpose and need for the Proposed Action. While a “Restored Lands” opinion has not yet been issued by the BIA, the site ultimately chosen as the Project Site appears to meet certain regulatory requirements for “restored lands” in that it is within 25 miles of the Tribe’s headquarters as well as where a significant number of residents reside. It was also determined to be a suitable size for development and was not under a Williamson Act contract. Therefore, consideration of an alternative site was rejected from full analysis as it would not meet the definition of a reasonable alternative that is feasible from an economic and technical standpoint, and thus would not accomplish the purpose and need for the Proposed Action.
Alternative with on-site wastewater disposal	As discussed in EA Appendix B, wastewater disposal area is limited by the development area needed for the alternatives, topography, and site infiltration capacity. These conditions can contribute to run-off which must be carefully managed when using recycled water. An infiltration study was performed for the project site in April 2024 which found very low infiltration soil capacities at the site; those results are included in Appendix B of Appendix B. Therefore, an

Alternative	Reason for Elimination from Consideration
	alternative that disposes treated wastewater on site would not be feasible or reduce potential environmental impacts.
Alternatives that do not include approval of a gaming management contract by National Indian Gaming Commission (NIGC)	For each alternative which includes a casino, the gaming activity may either be managed directly by employees of the Tribe or by a management contractor pursuant to a gaming management agreement approved by the NIGC. Under either form of management, the environmental impacts of the development of the casino for each alternative are the same. Therefore, analyzing gaming development alternatives that do not include approval of a gaming management agreement by the NIGC would not meaningfully contribute to the reasonable range of alternatives and such alternatives were eliminated

Appendix G

Air Quality Output Files

Scotts Valley Casino and Housing Project - Alternative A Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Scotts Valley Casino and Housing Project - Alternative A
Construction Start Date	1/4/2027
Operational Year	2029
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	34.8
Location	38.14051365427261, -122.21666784064999
County	Solano-San Francisco
City	Vallejo
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	860
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.25

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

User Defined Commercial	615	User Defined Unit	0.00	614,959	—	—	—	—
Enclosed Parking with Elevator	4,068	Space	36.6	1,595,011	—	—	—	—
Single Family Housing	24.0	Dwelling Unit	7.79	46,800	281,109	—	68.0	—
General Office Building	12.6	1000sqft	0.29	12,555	—	—	—	—
Other Asphalt Surfaces	8.40	Acre	8.40	0.00	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-9	Use Dust Suppressants
Construction	C-10-A	Water Exposed Surfaces
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Area Sources	LL-1	Replace Gas Powered Landscape Equipment with Zero-Emission Landscape Equipment

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	815	815	56.2	48.5	0.23	1.54	16.6	18.1	1.29	5.63	6.92	—	32,110	32,110	1.30	4.13	33,424

Mit.	815	815	56.2	48.5	0.23	1.54	10.8	12.3	1.29	3.38	4.67	—	32,110	32,110	1.30	4.13	33,424
% Reduced	—	—	—	—	—	—	35%	32%	—	40%	33%	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.18	4.14	58.0	45.4	0.23	1.54	19.8	21.0	1.29	10.1	11.2	—	32,110	32,110	1.30	4.13	33,374
Mit.	5.18	4.14	58.0	45.4	0.23	1.54	10.8	12.3	1.29	3.97	5.05	—	32,110	32,110	1.30	4.13	33,374
% Reduced	—	—	—	—	—	—	45%	41%	—	61%	55%	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	24.1	23.9	21.2	29.6	0.08	0.51	8.00	8.51	0.46	2.36	2.82	—	14,221	14,221	0.48	1.43	14,674
Mit.	24.1	23.9	21.2	29.6	0.08	0.51	6.80	7.30	0.46	1.83	2.29	—	14,221	14,221	0.48	1.43	14,674
% Reduced	—	—	—	—	—	—	15%	14%	—	22%	19%	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.41	4.36	3.87	5.41	0.01	0.09	1.46	1.55	0.08	0.43	0.51	—	2,354	2,354	0.08	0.24	2,429
Mit.	4.41	4.36	3.87	5.41	0.01	0.09	1.24	1.33	0.08	0.33	0.42	—	2,354	2,354	0.08	0.24	2,429
% Reduced	—	—	—	—	—	—	15%	14%	—	22%	19%	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	5.22	4.30	56.2	48.5	0.23	1.54	16.6	18.1	1.29	5.63	6.92	—	32,110	32,110	1.30	4.13	33,424

2028	815	815	21.7	46.6	0.09	0.44	9.85	10.3	0.41	2.42	2.83	—	19,053	19,053	0.54	1.65	19,601
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	5.18	4.14	58.0	45.4	0.23	1.54	19.8	21.0	1.29	10.1	11.2	—	32,110	32,110	1.30	4.13	33,374
2028	4.82	4.01	23.0	43.6	0.09	0.44	9.85	10.3	0.41	2.42	2.83	—	18,502	18,502	0.60	1.68	19,018
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	3.45	2.78	21.2	29.6	0.08	0.51	8.00	8.51	0.46	2.36	2.82	—	14,221	14,221	0.48	1.43	14,674
2028	24.1	23.9	7.15	13.6	0.03	0.14	3.02	3.17	0.13	0.74	0.88	—	5,831	5,831	0.18	0.52	5,997
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.63	0.51	3.87	5.41	0.01	0.09	1.46	1.55	0.08	0.43	0.51	—	2,354	2,354	0.08	0.24	2,429
2028	4.41	4.36	1.30	2.49	0.01	0.03	0.55	0.58	0.02	0.14	0.16	—	965	965	0.03	0.09	993

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	5.22	4.30	56.2	48.5	0.23	1.54	10.8	12.3	1.29	3.38	4.67	—	32,110	32,110	1.30	4.13	33,424
2028	815	815	21.7	46.6	0.09	0.44	9.85	10.3	0.41	2.42	2.83	—	19,053	19,053	0.54	1.65	19,601
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	5.18	4.14	58.0	45.4	0.23	1.54	10.8	12.3	1.29	3.97	5.05	—	32,110	32,110	1.30	4.13	33,374
2028	4.82	4.01	23.0	43.6	0.09	0.44	9.85	10.3	0.41	2.42	2.83	—	18,502	18,502	0.60	1.68	19,018
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	3.45	2.78	21.2	29.6	0.08	0.51	6.80	7.30	0.46	1.83	2.29	—	14,221	14,221	0.48	1.43	14,674

2028	24.1	23.9	7.15	13.6	0.03	0.14	3.02	3.17	0.13	0.74	0.88	—	5,831	5,831	0.18	0.52	5,997
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.63	0.51	3.87	5.41	0.01	0.09	1.24	1.33	0.08	0.33	0.42	—	2,354	2,354	0.08	0.24	2,429
2028	4.41	4.36	1.30	2.49	0.01	0.03	0.55	0.58	0.02	0.14	0.16	—	965	965	0.03	0.09	993

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	93.9	84.7	109	709	1.92	3.78	164	168	3.67	41.6	45.3	517	225,542	226,059	62.6	7.68	230,426
Mit.	76.5	68.7	108	611	1.91	3.60	164	168	3.54	41.6	45.2	517	225,176	225,693	62.6	7.68	230,059
% Reduced	18%	19%	1%	14%	< 0.5%	5%	—	< 0.5%	4%	—	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	75.3	67.3	118	544	1.81	3.60	164	168	3.54	41.6	45.2	517	214,459	214,976	62.9	8.27	219,025
Mit.	75.3	67.3	118	544	1.81	3.60	164	168	3.54	41.6	45.2	517	214,459	214,976	62.9	8.27	219,025
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	83.1	74.6	114	584	1.83	3.67	161	164	3.58	40.7	44.3	517	216,120	216,637	62.7	8.00	220,811
Mit.	74.6	66.7	113	535	1.82	3.59	161	164	3.52	40.7	44.2	517	215,939	216,457	62.7	8.00	220,630
% Reduced	10%	11%	< 0.5%	8%	< 0.5%	2%	—	< 0.5%	2%	—	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	15.2	13.6	20.8	107	0.33	0.67	29.3	30.0	0.65	7.43	8.08	85.7	35,781	35,867	10.4	1.33	36,558
Mit.	13.6	12.2	20.7	97.7	0.33	0.65	29.3	30.0	0.64	7.43	8.07	85.7	35,751	35,837	10.4	1.32	36,528
% Reduced	10%	11%	< 0.5%	8%	< 0.5%	2%	—	< 0.5%	2%	—	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	50.7	44.6	60.3	592	1.76	1.14	164	165	1.08	41.6	42.7	—	179,815	179,815	5.16	6.77	182,475
Area	34.2	32.8	0.91	98.1	0.01	0.18	—	0.18	0.14	—	0.14	0.00	502	502	0.02	< 0.005	504
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,706	41,706	4.96	0.39	41,945
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	93.9	84.7	109	709	1.92	3.78	164	168	3.67	41.6	45.3	517	225,542	226,059	62.6	7.68	230,426
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	49.4	43.2	70.2	525	1.66	1.14	164	165	1.08	41.6	42.7	—	169,133	169,133	5.48	7.36	171,476
Area	16.8	16.8	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,706	41,706	4.96	0.39	41,945
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37

Stationar	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	75.3	67.3	118	544	1.81	3.60	164	168	3.54	41.6	45.2	517	214,459	214,976	62.9	8.27	219,025
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	48.9	42.7	65.9	517	1.67	1.14	161	162	1.08	40.7	41.8	—	170,738	170,738	5.30	7.10	173,206
Area	25.4	24.7	0.41	48.3	< 0.005	0.09	—	0.09	0.06	—	0.06	0.00	200	200	0.01	< 0.005	201
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,706	41,706	4.96	0.39	41,945
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Stationary	6.65	6.05	27.1	1.78	0.03	0.89	0.00	0.89	0.89	0.00	0.89	0.00	3,097	3,097	0.12	0.02	3,107
Total	83.1	74.6	114	584	1.83	3.67	161	164	3.58	40.7	44.3	517	216,120	216,637	62.7	8.00	220,811
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	8.92	7.80	12.0	94.3	0.31	0.21	29.3	29.5	0.20	7.43	7.62	—	28,268	28,268	0.88	1.17	28,676
Area	4.63	4.51	0.07	8.82	< 0.005	0.02	—	0.02	0.01	—	0.01	0.00	33.2	33.2	< 0.005	< 0.005	33.3
Energy	0.41	0.20	3.72	3.11	0.02	0.28	—	0.28	0.28	—	0.28	—	6,905	6,905	0.82	0.06	6,944
Water	—	—	—	—	—	—	—	—	—	—	—	33.2	62.8	96.0	3.42	0.08	206
Waste	—	—	—	—	—	—	—	—	—	—	—	52.4	0.00	52.4	5.24	0.00	183
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
Stationary	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Total	15.2	13.6	20.8	107	0.33	0.67	29.3	30.0	0.65	7.43	8.08	85.7	35,781	35,867	10.4	1.33	36,558

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	50.7	44.6	60.3	592	1.76	1.14	164	165	1.08	41.6	42.7	—	179,815	179,815	5.16	6.77	182,475
Area	16.8	16.8	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,741	41,741	4.97	0.39	41,980
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	76.5	68.7	108	611	1.91	3.60	164	168	3.54	41.6	45.2	517	225,176	225,693	62.6	7.68	230,059
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	49.4	43.2	70.2	525	1.66	1.14	164	165	1.08	41.6	42.7	—	169,133	169,133	5.48	7.36	171,476
Area	16.8	16.8	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,706	41,706	4.96	0.39	41,945
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	75.3	67.3	118	544	1.81	3.60	164	168	3.54	41.6	45.2	517	214,459	214,976	62.9	8.27	219,025
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	48.9	42.7	65.9	517	1.67	1.14	161	162	1.08	40.7	41.8	—	170,738	170,738	5.30	7.10	173,206
Area	16.8	16.8	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.49	2.49	< 0.005	< 0.005	2.49
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,723	41,723	4.97	0.39	41,962
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244

Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Stationary	6.65	6.05	27.1	1.78	0.03	0.89	0.00	0.89	0.89	0.00	0.89	0.00	3,097	3,097	0.12	0.02	3,107
Total	74.6	66.7	113	535	1.82	3.59	161	164	3.52	40.7	44.2	517	215,939	216,457	62.7	8.00	220,630
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	8.92	7.80	12.0	94.3	0.31	0.21	29.3	29.5	0.20	7.43	7.62	—	28,268	28,268	0.88	1.17	28,676
Area	3.07	3.07	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.41	0.41	< 0.005	< 0.005	0.41
Energy	0.41	0.20	3.72	3.11	0.02	0.28	—	0.28	0.28	—	0.28	—	6,908	6,908	0.82	0.06	6,947
Water	—	—	—	—	—	—	—	—	—	—	—	33.2	62.8	96.0	3.42	0.08	206
Waste	—	—	—	—	—	—	—	—	—	—	—	52.4	0.00	52.4	5.24	0.00	183
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
Stationary	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Total	13.6	12.2	20.7	97.7	0.33	0.65	29.3	30.0	0.64	7.43	8.07	85.7	35,751	35,837	10.4	1.32	36,528

3. Construction Emissions Details

3.1. Demolition (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.64	2.21	19.9	18.6	0.03	0.80	—	0.80	0.73	—	0.73	—	3,427	3,427	0.14	0.03	3,439

Demolitio	—	—	—	—	—	—	4.11	4.11	—	0.62	0.62	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.55	0.51	< 0.005	0.02	—	0.02	0.02	—	0.02	—	93.9	93.9	< 0.005	< 0.005	94.2
Demolitio n	—	—	—	—	—	—	0.11	0.11	—	0.02	0.02	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	15.6
Demolitio n	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	119	119	< 0.005	0.01	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.20	0.07	3.96	1.34	0.02	0.06	0.85	0.91	0.04	0.23	0.27	—	3,103	3,103	0.13	0.50	3,255
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.31	3.31	< 0.005	< 0.005	3.36
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Hauling	0.01	< 0.005	0.11	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	85.0	85.0	< 0.005	0.01	89.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.1	14.1	< 0.005	< 0.005	14.8

3.2. Demolition (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.64	2.21	19.9	18.6	0.03	0.80	—	0.80	0.73	—	0.73	—	3,427	3,427	0.14	0.03	3,439
Demolition	—	—	—	—	—	—	4.11	4.11	—	0.62	0.62	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.55	0.51	< 0.005	0.02	—	0.02	0.02	—	0.02	—	93.9	93.9	< 0.005	< 0.005	94.2
Demolition	—	—	—	—	—	—	0.11	0.11	—	0.02	0.02	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.01	0.10	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	15.6
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	119	119	< 0.005	0.01	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.20	0.07	3.96	1.34	0.02	0.06	0.85	0.91	0.04	0.23	0.27	—	3,103	3,103	0.13	0.50	3,255
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.31	3.31	< 0.005	< 0.005	3.36
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.11	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	85.0	85.0	< 0.005	0.01	89.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.1	14.1	< 0.005	< 0.005	14.8

3.3. Site Preparation (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.63	3.05	28.0	28.3	0.05	1.17	—	1.17	1.08	—	1.08	—	5,298	5,298	0.21	0.04	5,316
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	1.15	1.16	< 0.005	0.05	—	0.05	0.04	—	0.04	—	218	218	0.01	< 0.005	218
Dust From Material Movement	—	—	—	—	—	—	0.81	0.81	—	0.42	0.42	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.21	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	36.0	36.0	< 0.005	< 0.005	36.2
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.08	0.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.55	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.80	5.80	< 0.005	< 0.005	5.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.96	0.96	< 0.005	< 0.005	0.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.4. Site Preparation (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.63	3.05	28.0	28.3	0.05	1.17	—	1.17	1.08	—	1.08	—	5,298	5,298	0.21	0.04	5,316

Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	1.15	1.16	< 0.005	0.05	—	0.05	0.04	—	0.04	—	218	218	0.01	< 0.005	218
Dust From Material Movement	—	—	—	—	—	—	0.32	0.32	—	0.16	0.16	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.21	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	36.0	36.0	< 0.005	< 0.005	36.2
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.55	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.80	5.80	< 0.005	< 0.005	5.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.96	0.96	< 0.005	< 0.005	0.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	9.46	9.46	—	3.69	3.69	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621

Dust From Material Movement	—	—	—	—	—	—	9.46	9.46	—	3.69	3.69	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.15	3.36	0.01	0.13	—	0.13	0.12	—	0.12	—	813	813	0.03	0.01	816
Dust From Material Movement	—	—	—	—	—	—	1.17	1.17	—	0.46	0.46	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.58	0.61	< 0.005	0.02	—	0.02	0.02	—	0.02	—	135	135	0.01	< 0.005	135
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.08	0.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.04	0.70	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	172	172	< 0.005	0.01	175
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	1.65	0.59	30.6	10.8	0.17	0.50	6.95	7.45	0.33	1.90	2.23	—	25,340	25,340	1.03	4.07	26,628
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.07	0.06	0.06	0.63	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	159	159	< 0.005	0.01	161
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	1.60	0.55	32.4	10.9	0.17	0.50	6.95	7.45	0.33	1.90	2.23	—	25,353	25,353	1.03	4.07	26,592
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.9	19.9	< 0.005	< 0.005	20.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.20	0.07	3.91	1.34	0.02	0.06	0.84	0.90	0.04	0.23	0.27	—	3,125	3,125	0.13	0.50	3,280
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.29	3.29	< 0.005	< 0.005	3.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	0.01	0.71	0.24	< 0.005	0.01	0.15	0.16	0.01	0.04	0.05	—	517	517	0.02	0.08	543

3.6. Grading (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	3.69	3.69	—	1.44	1.44	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	3.69	3.69	—	1.44	1.44	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.15	3.36	0.01	0.13	—	0.13	0.12	—	0.12	—	813	813	0.03	0.01	816
Dust From Material Movement	—	—	—	—	—	—	0.45	0.45	—	0.18	0.18	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.58	0.61	< 0.005	0.02	—	0.02	0.02	—	0.02	—	135	135	0.01	< 0.005	135
Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.03	0.03	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.04	0.70	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	172	172	< 0.005	0.01	175
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	1.65	0.59	30.6	10.8	0.17	0.50	6.95	7.45	0.33	1.90	2.23	—	25,340	25,340	1.03	4.07	26,628

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.63	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	159	159	< 0.005	0.01	161
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	1.60	0.55	32.4	10.9	0.17	0.50	6.95	7.45	0.33	1.90	2.23	—	25,353	25,353	1.03	4.07	26,592
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.9	19.9	< 0.005	< 0.005	20.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.20	0.07	3.91	1.34	0.02	0.06	0.84	0.90	0.04	0.23	0.27	—	3,125	3,125	0.13	0.50	3,280
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.29	3.29	< 0.005	< 0.005	3.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	0.01	0.71	0.24	< 0.005	0.01	0.15	0.16	0.01	0.04	0.05	—	517	517	0.02	0.08	543

3.7. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.54	4.89	6.73	0.01	0.18	—	0.18	0.16	—	0.16	—	1,248	1,248	0.05	0.01	1,252
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.89	1.23	< 0.005	0.03	—	0.03	0.03	—	0.03	—	207	207	0.01	< 0.005	207
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.25	2.96	1.92	30.9	0.00	0.00	7.27	7.27	0.00	1.70	1.70	—	7,573	7,573	0.14	0.28	7,688
Vendor	0.63	0.31	11.7	4.61	0.07	0.14	2.58	2.72	0.14	0.71	0.85	—	9,448	9,448	0.31	1.42	9,900
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.13	2.82	2.51	27.7	0.00	0.00	7.27	7.27	0.00	1.70	1.70	—	7,003	7,003	0.19	0.30	7,099
Vendor	0.61	0.29	12.3	4.76	0.07	0.14	2.58	2.72	0.14	0.71	0.85	—	9,455	9,455	0.31	1.42	9,888
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.61	1.45	1.16	14.0	0.00	0.00	3.70	3.70	0.00	0.87	0.87	—	3,690	3,690	0.09	0.16	3,745
Vendor	0.32	0.15	6.28	2.43	0.04	0.07	1.32	1.39	0.07	0.37	0.44	—	4,920	4,920	0.16	0.74	5,149

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29	0.26	0.21	2.55	0.00	0.00	0.68	0.68	0.00	0.16	0.16	—	611	611	0.02	0.03	620
Vendor	0.06	0.03	1.15	0.44	0.01	0.01	0.24	0.25	0.01	0.07	0.08	—	815	815	0.03	0.12	852
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.54	4.89	6.73	0.01	0.18	—	0.18	0.16	—	0.16	—	1,248	1,248	0.05	0.01	1,252
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.12	0.10	0.89	1.23	< 0.005	0.03	—	0.03	0.03	—	0.03	—	207	207	0.01	< 0.005	207
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.25	2.96	1.92	30.9	0.00	0.00	7.27	7.27	0.00	1.70	1.70	—	7,573	7,573	0.14	0.28	7,688
Vendor	0.63	0.31	11.7	4.61	0.07	0.14	2.58	2.72	0.14	0.71	0.85	—	9,448	9,448	0.31	1.42	9,900
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.13	2.82	2.51	27.7	0.00	0.00	7.27	7.27	0.00	1.70	1.70	—	7,003	7,003	0.19	0.30	7,099
Vendor	0.61	0.29	12.3	4.76	0.07	0.14	2.58	2.72	0.14	0.71	0.85	—	9,455	9,455	0.31	1.42	9,888
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.61	1.45	1.16	14.0	0.00	0.00	3.70	3.70	0.00	0.87	0.87	—	3,690	3,690	0.09	0.16	3,745
Vendor	0.32	0.15	6.28	2.43	0.04	0.07	1.32	1.39	0.07	0.37	0.44	—	4,920	4,920	0.16	0.74	5,149
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29	0.26	0.21	2.55	0.00	0.00	0.68	0.68	0.00	0.16	0.16	—	611	611	0.02	0.03	620
Vendor	0.06	0.03	1.15	0.44	0.01	0.01	0.24	0.25	0.01	0.07	0.08	—	815	815	0.03	0.12	852
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	0.31	2.76	4.00	0.01	0.09	—	0.09	0.09	—	0.09	—	741	741	0.03	0.01	744
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.50	0.73	< 0.005	0.02	—	0.02	0.02	—	0.02	—	123	123	< 0.005	< 0.005	123
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.17	2.88	1.66	29.2	0.00	0.00	7.27	7.27	0.00	1.70	1.70	—	7,432	7,432	0.14	0.28	7,545
Vendor	0.62	0.30	11.1	4.46	0.07	0.14	2.58	2.72	0.14	0.71	0.85	—	9,223	9,223	0.31	1.35	9,651
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.03	2.73	2.27	26.1	0.00	0.00	7.27	7.27	0.00	1.70	1.70	—	6,874	6,874	0.19	0.30	6,970
Vendor	0.61	0.29	11.8	4.61	0.07	0.14	2.58	2.72	0.14	0.71	0.85	—	9,231	9,231	0.31	1.36	9,643
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.93	0.84	0.61	7.80	0.00	0.00	2.20	2.20	0.00	0.51	0.51	—	2,151	2,151	0.05	0.09	2,184
Vendor	0.19	0.09	3.57	1.40	0.02	0.04	0.78	0.83	0.04	0.22	0.26	—	2,853	2,853	0.10	0.42	2,982
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.15	0.11	1.42	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	356	356	0.01	0.02	362
Vendor	0.03	0.02	0.65	0.26	< 0.005	0.01	0.14	0.15	0.01	0.04	0.05	—	472	472	0.02	0.07	494
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	0.31	2.76	4.00	0.01	0.09	—	0.09	0.09	—	0.09	—	741	741	0.03	0.01	744
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.50	0.73	< 0.005	0.02	—	0.02	0.02	—	0.02	—	123	123	< 0.005	< 0.005	123
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.17	2.88	1.66	29.2	0.00	0.00	7.27	7.27	0.00	1.70	1.70	—	7,432	7,432	0.14	0.28	7,545
Vendor	0.62	0.30	11.1	4.46	0.07	0.14	2.58	2.72	0.14	0.71	0.85	—	9,223	9,223	0.31	1.35	9,651
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.03	2.73	2.27	26.1	0.00	0.00	7.27	7.27	0.00	1.70	1.70	—	6,874	6,874	0.19	0.30	6,970
Vendor	0.61	0.29	11.8	4.61	0.07	0.14	2.58	2.72	0.14	0.71	0.85	—	9,231	9,231	0.31	1.36	9,643
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.93	0.84	0.61	7.80	0.00	0.00	2.20	2.20	0.00	0.51	0.51	—	2,151	2,151	0.05	0.09	2,184
Vendor	0.19	0.09	3.57	1.40	0.02	0.04	0.78	0.83	0.04	0.22	0.26	—	2,853	2,853	0.10	0.42	2,982

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.15	0.11	1.42	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	356	356	0.01	0.02	362
Vendor	0.03	0.02	0.65	0.26	< 0.005	0.01	0.14	0.15	0.01	0.04	0.05	—	472	472	0.02	0.07	494
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.82	0.69	6.63	9.91	0.01	0.26	—	0.26	0.24	—	0.24	—	1,511	1,511	0.06	0.01	1,516
Paving	11.8	11.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	41.5
Paving	0.32	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.85	6.85	< 0.005	< 0.005	6.88

Paving	0.06	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.50	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	129
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.25	3.25	< 0.005	< 0.005	3.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.54	0.54	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.12. Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.82	0.69	6.63	9.91	0.01	0.26	—	0.26	0.24	—	0.24	—	1,511	1,511	0.06	0.01	1,516
Paving	11.8	11.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	41.5
Paving	0.32	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.85	6.85	< 0.005	< 0.005	6.88
Paving	0.06	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.50	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	129
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.25	3.25	< 0.005	< 0.005	3.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.54	0.54	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.81	1.12	< 0.005	0.02	—	0.02	0.01	—	0.01	—	134	134	0.01	< 0.005	134
Architectural Coatings	814	814	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.66	3.66	< 0.005	< 0.005	3.67
Architectural Coatings	22.3	22.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.61	0.61	< 0.005	< 0.005	0.61
Architectural Coatings	4.07	4.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.63	0.58	0.33	5.85	0.00	0.00	1.45	1.45	0.00	0.34	0.34	—	1,486	1,486	0.03	0.06	1,509
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.14	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	38.1	38.1	< 0.005	< 0.005	38.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.31	6.31	< 0.005	< 0.005	6.41
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.14. Architectural Coating (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.81	1.12	< 0.005	0.02	—	0.02	0.01	—	0.01	—	134	134	0.01	< 0.005	134
Architectural Coatings	814	814	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.66	3.66	< 0.005	< 0.005	3.67
Architectural Coatings	22.3	22.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.61	0.61	< 0.005	< 0.005	0.61
Architectural Coatings	4.07	4.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.63	0.58	0.33	5.85	0.00	0.00	1.45	1.45	0.00	0.34	0.34	—	1,486	1,486	0.03	0.06	1,509
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.14	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	38.1	38.1	< 0.005	< 0.005	38.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.31	6.31	< 0.005	< 0.005	6.41
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Commercial	49.3	43.2	59.2	582	1.74	1.13	162	163	1.06	41.0	42.1	—	177,087	177,087	5.06	6.66	179,701
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	1.07	1.00	0.75	6.95	0.02	0.01	1.66	1.67	0.01	0.42	0.43	—	1,849	1,849	0.08	0.08	1,880
General Office Building	0.41	0.37	0.33	3.14	0.01	0.01	0.79	0.80	0.01	0.20	0.21	—	879	879	0.03	0.04	893
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	50.7	44.6	60.3	592	1.76	1.14	164	165	1.08	41.6	42.7	—	179,815	179,815	5.16	6.77	182,475
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	48.0	41.9	68.9	515	1.63	1.13	162	163	1.06	41.0	42.1	—	166,563	166,563	5.36	7.23	168,865
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	1.02	0.94	0.87	6.78	0.02	0.01	1.66	1.67	0.01	0.42	0.43	—	1,742	1,742	0.09	0.09	1,771
General Office Building	0.39	0.36	0.39	2.97	0.01	0.01	0.79	0.80	0.01	0.20	0.21	—	828	828	0.04	0.04	840
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Total	49.4	43.2	70.2	525	1.66	1.14	164	165	1.08	41.6	42.7	—	169,133	169,133	5.48	7.36	171,476
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	8.67	7.56	11.8	92.6	0.30	0.21	28.9	29.1	0.19	7.32	7.51	—	27,838	27,838	0.86	1.15	28,240
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	0.18	0.17	0.15	1.17	< 0.005	< 0.005	0.30	0.30	< 0.005	0.08	0.08	—	291	291	0.01	0.01	296
General Office Building	0.07	0.06	0.07	0.52	< 0.005	< 0.005	0.14	0.14	< 0.005	0.04	0.04	—	138	138	0.01	0.01	140
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	8.92	7.80	12.0	94.3	0.31	0.21	29.3	29.5	0.20	7.43	7.62	—	28,268	28,268	0.88	1.17	28,676

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	49.3	43.2	59.2	582	1.74	1.13	162	163	1.06	41.0	42.1	—	177,087	177,087	5.06	6.66	179,701
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Single Family Housing	1.07	1.00	0.75	6.95	0.02	0.01	1.66	1.67	0.01	0.42	0.43	—	1,849	1,849	0.08	0.08	1,880
General Office Building	0.41	0.37	0.33	3.14	0.01	0.01	0.79	0.80	0.01	0.20	0.21	—	879	879	0.03	0.04	893
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	50.7	44.6	60.3	592	1.76	1.14	164	165	1.08	41.6	42.7	—	179,815	179,815	5.16	6.77	182,475
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	48.0	41.9	68.9	515	1.63	1.13	162	163	1.06	41.0	42.1	—	166,563	166,563	5.36	7.23	168,865
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	1.02	0.94	0.87	6.78	0.02	0.01	1.66	1.67	0.01	0.42	0.43	—	1,742	1,742	0.09	0.09	1,771
General Office Building	0.39	0.36	0.39	2.97	0.01	0.01	0.79	0.80	0.01	0.20	0.21	—	828	828	0.04	0.04	840
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	49.4	43.2	70.2	525	1.66	1.14	164	165	1.08	41.6	42.7	—	169,133	169,133	5.48	7.36	171,476
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	8.67	7.56	11.8	92.6	0.30	0.21	28.9	29.1	0.19	7.32	7.51	—	27,838	27,838	0.86	1.15	28,240

Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	0.18	0.17	0.15	1.17	< 0.005	< 0.005	0.30	0.30	< 0.005	0.08	0.08	—	291	291	0.01	0.01	296
General Office Building	0.07	0.06	0.07	0.52	< 0.005	< 0.005	0.14	0.14	< 0.005	0.04	0.04	—	138	138	0.01	0.01	140
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	8.92	7.80	12.0	94.3	0.31	0.21	29.3	29.5	0.20	7.43	7.62	—	28,268	28,268	0.88	1.17	28,676

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	13,800	13,800	2.23	0.27	13,936
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	3,290	3,290	0.53	0.06	3,323
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	114	114	0.02	< 0.005	115

General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	147	147	0.02	< 0.005	148
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	17,351	17,351	2.81	0.34	17,523
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	13,800	13,800	2.23	0.27	13,936
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	3,290	3,290	0.53	0.06	3,323
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	114	114	0.02	< 0.005	115
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	147	147	0.02	< 0.005	148
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	17,351	17,351	2.81	0.34	17,523
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	2,285	2,285	0.37	0.04	2,307
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	545	545	0.09	0.01	550

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	18.9	18.9	< 0.005	< 0.005	19.1
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	24.3	24.3	< 0.005	< 0.005	24.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,873	2,873	0.46	0.06	2,901

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	13,809	13,809	2.23	0.27	13,946
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	3,315	3,315	0.54	0.07	3,348
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	115	115	0.02	< 0.005	116
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	147	147	0.02	< 0.005	149
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	17,386	17,386	2.81	0.34	17,558

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	13,800	13,800	2.23	0.27	13,936
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	3,290	3,290	0.53	0.06	3,323
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	114	114	0.02	< 0.005	115
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	147	147	0.02	< 0.005	148
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	17,351	17,351	2.81	0.34	17,523
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	2,285	2,285	0.37	0.04	2,308
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	547	547	0.09	0.01	552
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	19.0	19.0	< 0.005	< 0.005	19.1
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	24.3	24.3	< 0.005	< 0.005	24.6

Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,876	2,876	0.47	0.06	2,904

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	0.02	0.01	0.18	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	224	224	0.02	< 0.005	224
General Office Building	0.01	0.01	0.10	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	116	116	0.01	< 0.005	116
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	24,355	24,355	2.16	0.05	24,422
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081

Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	0.02	0.01	0.18	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	224	224	0.02	< 0.005	224
General Office Building	0.01	0.01	0.10	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	116	116	0.01	< 0.005	116
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	24,355	24,355	2.16	0.05	24,422
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	3,976	3,976	0.35	0.01	3,987
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	37.0	37.0	< 0.005	< 0.005	37.1
General Office Building	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	19.2	19.2	< 0.005	< 0.005	19.3
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.41	0.20	3.72	3.11	0.02	0.28	—	0.28	0.28	—	0.28	—	4,032	4,032	0.36	0.01	4,043

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	0.02	0.01	0.18	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	224	224	0.02	< 0.005	224
General Office Building	0.01	0.01	0.10	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	116	116	0.01	< 0.005	116
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	24,355	24,355	2.16	0.05	24,422
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	0.02	0.01	0.18	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	224	224	0.02	< 0.005	224

General Office Building	0.01	0.01	0.10	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	116	116	0.01	< 0.005	116
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	24,355	24,355	2.16	0.05	24,422
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	3,976	3,976	0.35	0.01	3,987
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Single Family Housing	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	37.0	37.0	< 0.005	< 0.005	37.1
General Office Building	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	19.2	19.2	< 0.005	< 0.005	19.3
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.41	0.20	3.72	3.11	0.02	0.28	—	0.28	0.28	—	0.28	—	4,032	4,032	0.36	0.01	4,043

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Hearths	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Consumer Products	14.6	14.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.23	2.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	17.3	16.0	0.83	98.0	0.01	0.17	—	0.17	0.13	—	0.13	—	401	401	0.02	< 0.005	403
Total	34.2	32.8	0.91	98.1	0.01	0.18	—	0.18	0.14	—	0.14	0.00	502	502	0.02	< 0.005	504
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Consumer Products	14.6	14.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.23	2.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	16.8	16.8	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.41	0.41	< 0.005	< 0.005	0.41
Consumer Products	2.66	2.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.41	0.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.56	1.44	0.07	8.82	< 0.005	0.02	—	0.02	0.01	—	0.01	—	32.8	32.8	< 0.005	< 0.005	32.9

Total	4.63	4.51	0.07	8.82	< 0.005	0.02	—	0.02	0.01	—	0.01	0.00	33.2	33.2	< 0.005	< 0.005	33.3

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Consumer Products	14.6	14.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.23	2.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	16.8	16.8	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Consumer Products	14.6	14.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.23	2.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	16.8	16.8	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.41	0.41	< 0.005	< 0.005	0.41
Consumer Products	2.66	2.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectu Coatings	0.41	0.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	3.07	3.07	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.41	0.41	< 0.005	< 0.005	0.41

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	33.2	62.8	96.0	3.42	0.08	206
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	33.2	62.8	96.0	3.42	0.08	206

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	33.2	62.8	96.0	3.42	0.08	206
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	33.2	62.8	96.0	3.42	0.08	206

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.82	0.00	8.82	0.88	0.00	30.9
General Office Building	—	—	—	—	—	—	—	—	—	—	—	6.29	0.00	6.29	0.63	0.00	22.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.82	0.00	8.82	0.88	0.00	30.9
General Office Building	—	—	—	—	—	—	—	—	—	—	—	6.29	0.00	6.29	0.63	0.00	22.0

Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.46	0.00	1.46	0.15	0.00	5.11
General Office Building	—	—	—	—	—	—	—	—	—	—	—	1.04	0.00	1.04	0.10	0.00	3.65
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	52.4	0.00	52.4	5.24	0.00	183

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055

Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.82	0.00	8.82	0.88	0.00	30.9
General Office Building	—	—	—	—	—	—	—	—	—	—	—	6.29	0.00	6.29	0.63	0.00	22.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.82	0.00	8.82	0.88	0.00	30.9
General Office Building	—	—	—	—	—	—	—	—	—	—	—	6.29	0.00	6.29	0.63	0.00	22.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.46	0.00	1.46	0.15	0.00	5.11
General Office Building	—	—	—	—	—	—	—	—	—	—	—	1.04	0.00	1.04	0.10	0.00	3.65
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	52.4	0.00	52.4	5.24	0.00	183

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Emergency	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Emergency Generato	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetatio	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	1/4/2027	1/15/2027	5.00	10.0	—
Site Preparation	Site Preparation	1/16/2027	2/5/2027	5.00	15.0	—
Grading	Grading	2/6/2027	4/9/2027	5.00	45.0	—
Building Construction	Building Construction	4/10/2027	6/6/2028	5.00	302	—
Paving	Paving	6/7/2028	6/20/2028	5.00	10.0	—
Architectural Coating	Architectural Coating	6/21/2028	7/4/2028	5.00	10.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37

Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40

Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	45.9	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT

Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	375	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	879	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	367	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	176	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	45.9	20.0	HHDT

Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	375	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	879	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	367	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	176	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	94,770	31,590	1,013,038	321,731	117,643

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	39,900	—
Site Preparation	—	—	0.00	0.00	—
Grading	135,000	—	53.3	0.00	—
Paving	0.00	0.00	0.00	0.00	45.3

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
User Defined Commercial	0.00	0%
Enclosed Parking with Elevator	36.6	100%
Single Family Housing	0.26	0%
General Office Building	0.00	0%

Other Asphalt Surfaces	8.40	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2027	0.00	204	0.03	< 0.005
2028	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Commercial	8,216	8,216	8,216	2,998,786	230,006	230,006	230,006	83,952,069
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single Family Housing	271	271	271	98,900	2,360	2,360	2,360	861,344
General Office Building	95.0	95.0	95.0	34,690	1,129	1,129	1,129	412,154
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Commercial	8,216	8,216	8,216	2,998,786	230,006	230,006	230,006	83,952,069
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Single Family Housing	271	271	271	98,900	2,360	2,360	2,360	861,344
General Office Building	95.0	95.0	95.0	34,690	1,129	1,129	1,129	412,154
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	5
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	19
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0

Gas Fireplaces	5
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	19
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
94770	31,590	1,013,038	321,731	117,643

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
User Defined Commercial	24,692,430	204	0.0330	0.0040	74,932,069
Enclosed Parking with Elevator	5,887,874	204	0.0330	0.0040	0.00
Single Family Housing	204,617	204	0.0330	0.0040	698,161
General Office Building	262,768	204	0.0330	0.0040	362,451
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
User Defined Commercial	24,692,430	204	0.0330	0.0040	74,932,069
Enclosed Parking with Elevator	5,887,874	204	0.0330	0.0040	0.00
Single Family Housing	204,617	204	0.0330	0.0040	698,161
General Office Building	262,768	204	0.0330	0.0040	362,451
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
User Defined Commercial	104,755,000	0.00
Enclosed Parking with Elevator	—	0.00
Single Family Housing	0.00	0.00
General Office Building	0.00	0.00
Other Asphalt Surfaces	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
User Defined Commercial	104,755,000	0.00
Enclosed Parking with Elevator	—	0.00
Single Family Housing	0.00	0.00
General Office Building	0.00	0.00
Other Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
User Defined Commercial	560	—
Enclosed Parking with Elevator	0.00	—
Single Family Housing	16.4	—
General Office Building	11.7	—
Other Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
User Defined Commercial	560	—
Enclosed Parking with Elevator	0.00	—
Single Family Housing	16.4	—
General Office Building	11.7	—
Other Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	4.00	0.20	72.0	4,675	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
Boiler - CNG (0–2 MMBTU)	Electric	4.00	0.50	—	—

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	14.2	annual days of extreme heat
Extreme Precipitation	5.55	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	16.6	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	2	0	0	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	2	1	1	3
Sea Level Rise	1	1	1	2

Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	14.9
AQ-PM	32.1
AQ-DPM	18.5
Drinking Water	40.7
Lead Risk Housing	2.91
Pesticides	49.1
Toxic Releases	74.0
Traffic	67.8
Effect Indicators	—
CleanUp Sites	0.00

Groundwater	47.4
Haz Waste Facilities/Generators	28.3
Impaired Water Bodies	23.9
Solid Waste	0.00
Sensitive Population	—
Asthma	86.9
Cardio-vascular	50.3
Low Birth Weights	21.8
Socioeconomic Factor Indicators	—
Education	17.8
Housing	1.29
Linguistic	32.0
Poverty	17.5
Unemployment	33.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	89.11843963
Employed	47.36301809
Median HI	95.72693443
Education	—
Bachelor's or higher	73.74566919
High school enrollment	17.07943026
Preschool enrollment	65.54600282
Transportation	—

Auto Access	94.58488387
Active commuting	38.47042217
Social	—
2-parent households	65.84113948
Voting	69.0619787
Neighborhood	—
Alcohol availability	87.18080328
Park access	62.23533941
Retail density	9.187732581
Supermarket access	2.399589375
Tree canopy	73.38637239
Housing	—
Homeownership	99.51238291
Housing habitability	92.33927884
Low-inc homeowner severe housing cost burden	90.00384961
Low-inc renter severe housing cost burden	66.09778006
Uncrowded housing	62.77428461
Health Outcomes	—
Insured adults	81.62453484
Arthritis	49.4
Asthma ER Admissions	13.4
High Blood Pressure	31.6
Cancer (excluding skin)	49.7
Asthma	83.3
Coronary Heart Disease	79.3
Chronic Obstructive Pulmonary Disease	84.0
Diagnosed Diabetes	51.3

Life Expectancy at Birth	70.4
Cognitively Disabled	62.4
Physically Disabled	86.7
Heart Attack ER Admissions	40.6
Mental Health Not Good	82.3
Chronic Kidney Disease	79.8
Obesity	75.7
Pedestrian Injuries	19.6
Physical Health Not Good	76.2
Stroke	70.4
Health Risk Behaviors	—
Binge Drinking	88.4
Current Smoker	77.7
No Leisure Time for Physical Activity	61.3
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	56.6
Elderly	50.2
English Speaking	83.2
Foreign-born	75.7
Outdoor Workers	74.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	68.4
Traffic Density	47.7
Traffic Access	23.0
Other Indices	—

Hardship	22.7
Other Decision Support	—
2016 Voting	65.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	25.0
Healthy Places Index Score for Project Location (b)	86.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	See Project Description for Alternative A.
Construction: Construction Phases	18-month construction schedule.
Operations: Vehicle Data	See Traffic Study.
Operations: Water and Waste Water	See Water/Wastewater Study.

Operations: Energy Use	User Defined Commercial energy inputs based on High Quality Restaurant defaults.
Operations: Solid Waste	User Defined Commercial solid waste rates based on High Quality Restaurant default values.
Construction: Dust From Material Movement	See Project Description.
Operations: Emergency Generators and Fire Pumps	See Generator Assumptions.
Operations: Generators + Pumps EF	Based on Manufacturers assumptions.

Scotts Valley Casino and Housing Project - Alternative A Custom Report

Table of Contents

2. Emissions Summary

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	32.4	28.6	30.3	422	1.44	0.56	164	165	0.52	41.5	42.0	—	147,106	147,106	3.15	4.69	148,626
Area	16.8	16.8	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,741	41,741	4.97	0.39	41,980
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	58.2	52.7	78.3	441	1.60	3.02	164	167	2.98	41.5	44.5	517	192,467	192,984	60.5	5.60	196,210
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	31.3	27.5	35.7	360	1.35	0.56	164	165	0.52	41.5	42.0	—	137,901	137,901	3.23	5.12	139,510
Area	16.8	16.8	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	101	101	< 0.005	< 0.005	101
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,706	41,706	4.96	0.39	41,945
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	57.1	51.6	83.6	379	1.51	3.02	164	167	2.98	41.5	44.5	517	183,227	183,744	60.6	6.03	187,058

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	31.3	27.6	33.3	362	1.37	0.56	160	161	0.52	40.6	41.1	—	139,299	139,299	3.18	4.93	140,866
Area	16.8	16.8	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.49	2.49	< 0.005	< 0.005	2.49
Energy	2.25	1.12	20.4	17.1	0.12	1.55	—	1.55	1.55	—	1.55	—	41,723	41,723	4.97	0.39	41,962
Water	—	—	—	—	—	—	—	—	—	—	—	201	379	580	20.6	0.50	1,244
Waste	—	—	—	—	—	—	—	—	—	—	—	317	0.00	317	31.7	0.00	1,108
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.37
Stationary	6.65	6.05	27.1	1.78	0.03	0.89	0.00	0.89	0.89	0.00	0.89	0.00	3,097	3,097	0.12	0.02	3,107
Total	57.0	51.6	80.8	381	1.52	3.00	160	163	2.97	40.6	43.5	517	184,501	185,018	60.6	5.84	188,290
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.72	5.03	6.08	66.1	0.25	0.10	29.3	29.4	0.10	7.40	7.50	—	23,063	23,063	0.53	0.82	23,322
Area	3.07	3.07	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.41	0.41	< 0.005	< 0.005	0.41
Energy	0.41	0.20	3.72	3.11	0.02	0.28	—	0.28	0.28	—	0.28	—	6,908	6,908	0.82	0.06	6,947
Water	—	—	—	—	—	—	—	—	—	—	—	33.2	62.8	96.0	3.42	0.08	206
Waste	—	—	—	—	—	—	—	—	—	—	—	52.4	0.00	52.4	5.24	0.00	183
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
Stationary	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Total	10.4	9.41	14.7	69.5	0.28	0.55	29.3	29.8	0.54	7.40	7.95	85.7	30,546	30,632	10.0	0.97	31,174

Scotts Valley Casino and Housing Project Alternative B Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Scotts Valley Casino and Housing Project Alternative B
Construction Start Date	1/4/2027
Operational Year	2029
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	34.8
Location	38.14148496658606, -122.21615977569529
County	Solano-San Francisco
City	Vallejo
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	860
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.24

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

User Defined Commercial	615	User Defined Unit	0.00	614,949	—	—	—	—
Enclosed Parking with Elevator	4,068	Space	36.6	1,595,011	—	—	—	—
Other Asphalt Surfaces	6.10	Acre	6.10	0.00	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-9	Use Dust Suppressants
Construction	C-10-A	Water Exposed Surfaces
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Area Sources	LL-1	Replace Gas Powered Landscape Equipment with Zero-Emission Landscape Equipment

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	733	733	88.0	50.0	0.41	2.05	24.0	26.1	1.63	7.65	9.28	—	58,389	58,389	2.36	8.35	61,038
Mit.	733	733	88.0	50.0	0.41	2.05	18.1	20.2	1.63	5.37	7.00	—	58,389	58,389	2.36	8.35	61,038
% Reduced	—	—	—	—	—	—	25%	23%	—	30%	25%	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.84	4.14	91.6	50.2	0.41	2.05	24.0	26.1	1.63	10.1	11.2	—	58,402	58,402	2.36	8.35	60,951
Mit.	6.84	4.14	91.6	50.2	0.41	2.05	18.1	20.2	1.63	5.37	7.00	—	58,402	58,402	2.36	8.35	60,951
% Reduced	—	—	—	—	—	—	25%	23%	—	47%	38%	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	21.9	21.6	25.1	30.8	0.10	0.57	8.81	9.38	0.50	2.58	3.08	—	17,327	17,327	0.61	1.94	17,937
Mit.	21.9	21.6	25.1	30.8	0.10	0.57	7.58	8.15	0.50	2.05	2.55	—	17,327	17,327	0.61	1.94	17,937
% Reduced	—	—	—	—	—	—	14%	13%	—	21%	17%	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.99	3.95	4.59	5.62	0.02	0.10	1.61	1.71	0.09	0.47	0.56	—	2,869	2,869	0.10	0.32	2,970
Mit.	3.99	3.95	4.59	5.62	0.02	0.10	1.38	1.49	0.09	0.37	0.47	—	2,869	2,869	0.10	0.32	2,970
% Reduced	—	—	—	—	—	—	14%	13%	—	21%	17%	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.93	4.25	88.0	50.0	0.41	2.05	24.0	26.1	1.63	7.65	9.28	—	58,389	58,389	2.36	8.35	61,038
2028	733	733	21.5	46.2	0.09	0.43	9.72	10.2	0.41	2.38	2.79	—	18,829	18,829	0.54	1.63	19,371
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2027	6.84	4.14	91.6	50.2	0.41	2.05	24.0	26.1	1.63	10.1	11.2	—	58,402	58,402	2.36	8.35	60,951
2028	4.77	3.97	22.8	43.2	0.09	0.43	9.72	10.2	0.41	2.38	2.79	—	18,287	18,287	0.59	1.66	18,797
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	3.63	2.83	25.1	30.8	0.10	0.57	8.81	9.38	0.50	2.58	3.08	—	17,327	17,327	0.61	1.94	17,937
2028	21.9	21.6	7.09	13.5	0.03	0.14	2.98	3.12	0.13	0.73	0.86	—	5,764	5,764	0.17	0.51	5,927
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.66	0.52	4.59	5.62	0.02	0.10	1.61	1.71	0.09	0.47	0.56	—	2,869	2,869	0.10	0.32	2,970
2028	3.99	3.95	1.29	2.47	0.01	0.03	0.54	0.57	0.02	0.13	0.16	—	954	954	0.03	0.09	981

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.93	4.25	88.0	50.0	0.41	2.05	18.1	20.2	1.63	5.37	7.00	—	58,389	58,389	2.36	8.35	61,038
2028	733	733	21.5	46.2	0.09	0.43	9.72	10.2	0.41	2.38	2.79	—	18,829	18,829	0.54	1.63	19,371
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.84	4.14	91.6	50.2	0.41	2.05	18.1	20.2	1.63	5.37	7.00	—	58,402	58,402	2.36	8.35	60,951
2028	4.77	3.97	22.8	43.2	0.09	0.43	9.72	10.2	0.41	2.38	2.79	—	18,287	18,287	0.59	1.66	18,797
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	3.63	2.83	25.1	30.8	0.10	0.57	7.58	8.15	0.50	2.05	2.55	—	17,327	17,327	0.61	1.94	17,937
2028	21.9	21.6	7.09	13.5	0.03	0.14	2.98	3.12	0.13	0.73	0.86	—	5,764	5,764	0.17	0.51	5,927
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.66	0.52	4.59	5.62	0.02	0.10	1.38	1.49	0.09	0.37	0.47	—	2,869	2,869	0.10	0.32	2,970

2028	3.99	3.95	1.29	2.47	0.01	0.03	0.54	0.57	0.02	0.13	0.16	—	954	954	0.03	0.09	981

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	88.1	79.6	102	641	1.72	3.62	145	149	3.51	36.8	40.3	496	204,165	204,661	59.8	6.92	208,673
Mit.	71.0	63.8	101	545	1.71	3.45	145	149	3.39	36.8	40.2	496	203,805	204,301	59.8	6.92	208,311
% Reduced	19%	20%	1%	15%	< 0.5%	5%	—	< 0.5%	4%	—	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	69.8	62.5	110	488	1.62	3.45	145	149	3.39	36.8	40.2	496	194,325	194,821	60.1	7.44	198,554
Mit.	69.8	62.5	110	488	1.62	3.45	145	149	3.39	36.8	40.2	496	194,325	194,821	60.1	7.44	198,554
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	77.6	69.8	106	527	1.63	3.52	142	146	3.44	36.0	39.4	496	195,895	196,391	59.9	7.21	200,233
Mit.	69.2	62.0	106	480	1.63	3.43	142	146	3.37	36.0	39.4	496	195,717	196,213	59.9	7.21	200,055
% Reduced	11%	11%	< 0.5%	9%	< 0.5%	2%	—	< 0.5%	2%	—	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	14.2	12.7	19.4	96.2	0.30	0.64	25.9	26.6	0.63	6.57	7.20	82.1	32,433	32,515	9.92	1.19	33,151
Mit.	12.6	11.3	19.3	87.5	0.30	0.63	25.9	26.6	0.62	6.57	7.19	82.1	32,403	32,485	9.92	1.19	33,121

% Reduced	11%	11%	< 0.5%	9%	< 0.5%	2%	—	< 0.5%	2%	—	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	46.8	41.3	53.8	527	1.56	1.01	145	146	0.95	36.8	37.8	—	159,159	159,159	4.65	6.03	161,526
Area	32.4	31.1	0.81	96.1	0.01	0.17	—	0.17	0.13	—	0.13	—	395	395	0.02	< 0.005	397
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,105	41,105	4.89	0.38	41,340
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	88.1	79.6	102	641	1.72	3.62	145	149	3.51	36.8	40.3	496	204,165	204,661	59.8	6.92	208,673
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	45.5	39.9	62.6	469	1.47	1.01	145	146	0.95	36.8	37.8	—	149,714	149,714	4.96	6.56	151,804
Area	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,105	41,105	4.89	0.38	41,340
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	69.8	62.5	110	488	1.62	3.45	145	149	3.39	36.8	40.2	496	194,325	194,821	60.1	7.44	198,554
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	45.0	39.5	58.8	461	1.48	1.01	142	143	0.95	36.0	37.0	—	151,131	151,131	4.78	6.32	153,330
Area	23.7	23.1	0.40	47.4	< 0.005	0.08	—	0.08	0.06	—	0.06	—	195	195	0.01	< 0.005	196
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,105	41,105	4.89	0.38	41,340
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Stationary	6.65	6.05	27.1	1.78	0.03	0.89	0.00	0.89	0.89	0.00	0.89	0.00	3,097	3,097	0.12	0.02	3,107
Total	77.6	69.8	106	527	1.63	3.52	142	146	3.44	36.0	39.4	496	195,895	196,391	59.9	7.21	200,233
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	8.21	7.21	10.7	84.1	0.27	0.19	25.9	26.1	0.17	6.57	6.74	—	25,022	25,022	0.79	1.05	25,386
Area	4.33	4.22	0.07	8.65	< 0.005	0.02	—	0.02	0.01	—	0.01	—	32.3	32.3	< 0.005	< 0.005	32.4
Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	6,805	6,805	0.81	0.06	6,844
Water	—	—	—	—	—	—	—	—	—	—	—	32.2	60.8	93.0	3.31	0.08	199
Waste	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175
Stationary	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Total	14.2	12.7	19.4	96.2	0.30	0.64	25.9	26.6	0.63	6.57	7.20	82.1	32,433	32,515	9.92	1.19	33,151

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	46.8	41.3	53.8	527	1.56	1.01	145	146	0.95	36.8	37.8	—	159,159	159,159	4.65	6.03	161,526
Area	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,139	41,139	4.90	0.38	41,375
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055

Stationar	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	71.0	63.8	101	545	1.71	3.45	145	149	3.39	36.8	40.2	496	203,805	204,301	59.8	6.92	208,311
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	45.5	39.9	62.6	469	1.47	1.01	145	146	0.95	36.8	37.8	—	149,714	149,714	4.96	6.56	151,804
Area	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,105	41,105	4.89	0.38	41,340
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	69.8	62.5	110	488	1.62	3.45	145	149	3.39	36.8	40.2	496	194,325	194,821	60.1	7.44	198,554
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	45.0	39.5	58.8	461	1.48	1.01	142	143	0.95	36.0	37.0	—	151,131	151,131	4.78	6.32	153,330
Area	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,122	41,122	4.89	0.38	41,358
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Stationary	6.65	6.05	27.1	1.78	0.03	0.89	0.00	0.89	0.89	0.00	0.89	0.00	3,097	3,097	0.12	0.02	3,107
Total	69.2	62.0	106	480	1.63	3.43	142	146	3.37	36.0	39.4	496	195,717	196,213	59.9	7.21	200,055
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	8.21	7.21	10.7	84.1	0.27	0.19	25.9	26.1	0.17	6.57	6.74	—	25,022	25,022	0.79	1.05	25,386
Area	2.79	2.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	6,808	6,808	0.81	0.06	6,847
Water	—	—	—	—	—	—	—	—	—	—	—	32.2	60.8	93.0	3.31	0.08	199
Waste	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175

Stationar	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Total	12.6	11.3	19.3	87.5	0.30	0.63	25.9	26.6	0.62	6.57	7.19	82.1	32,403	32,485	9.92	1.19	33,121

3. Construction Emissions Details

3.1. Demolition (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.64	2.21	19.9	18.6	0.03	0.80	—	0.80	0.73	—	0.73	—	3,427	3,427	0.14	0.03	3,439
Demolition	—	—	—	—	—	—	3.18	3.18	—	0.48	0.48	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.55	0.51	< 0.005	0.02	—	0.02	0.02	—	0.02	—	93.9	93.9	< 0.005	< 0.005	94.2
Demolition	—	—	—	—	—	—	0.09	0.09	—	0.01	0.01	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	15.6

Demolitio	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	119	119	< 0.005	0.01	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.15	0.05	3.08	1.04	0.02	0.05	0.66	0.71	0.03	0.18	0.21	—	2,407	2,407	0.10	0.39	2,524
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.31	3.31	< 0.005	< 0.005	3.36
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	65.9	65.9	< 0.005	0.01	69.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	11.5

3.2. Demolition (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.64	2.21	19.9	18.6	0.03	0.80	—	0.80	0.73	—	0.73	—	3,427	3,427	0.14	0.03	3,439
Demolition	—	—	—	—	—	—	3.18	3.18	—	0.48	0.48	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.55	0.51	< 0.005	0.02	—	0.02	0.02	—	0.02	—	93.9	93.9	< 0.005	< 0.005	94.2
Demolition	—	—	—	—	—	—	0.09	0.09	—	0.01	0.01	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	15.6
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	119	119	< 0.005	0.01	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Hauling	0.15	0.05	3.08	1.04	0.02	0.05	0.66	0.71	0.03	0.18	0.21	—	2,407	2,407	0.10	0.39	2,524
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.31	3.31	< 0.005	< 0.005	3.36
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	65.9	65.9	< 0.005	0.01	69.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	11.5

3.3. Site Preparation (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.63	3.05	28.0	28.3	0.05	1.17	—	1.17	1.08	—	1.08	—	5,298	5,298	0.21	0.04	5,316
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.15	0.13	1.15	1.16	< 0.005	0.05	—	0.05	0.04	—	0.04	—	218	218	0.01	< 0.005	218
Dust From Material Movement	—	—	—	—	—	—	0.81	0.81	—	0.42	0.42	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.21	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	36.0	36.0	< 0.005	< 0.005	36.2
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.08	0.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.55	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.80	5.80	< 0.005	< 0.005	5.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.96	0.96	< 0.005	< 0.005	0.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.4. Site Preparation (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.63	3.05	28.0	28.3	0.05	1.17	—	1.17	1.08	—	1.08	—	5,298	5,298	0.21	0.04	5,316
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	1.15	1.16	< 0.005	0.05	—	0.05	0.04	—	0.04	—	218	218	0.01	< 0.005	218
Dust From Material Movement	—	—	—	—	—	—	0.32	0.32	—	0.16	0.16	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.03	0.02	0.21	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	36.0	36.0	< 0.005	< 0.005	36.2
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.55	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.80	5.80	< 0.005	< 0.005	5.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.96	0.96	< 0.005	< 0.005	0.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	9.72	9.72	—	3.73	3.73	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	9.72	9.72	—	3.73	3.73	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.15	3.36	0.01	0.13	—	0.13	0.12	—	0.12	—	813	813	0.03	0.01	816
Dust From Material Movement	—	—	—	—	—	—	1.20	1.20	—	0.46	0.46	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.08	0.07	0.58	0.61	< 0.005	0.02	—	0.02	0.02	—	0.02	—	135	135	0.01	< 0.005	135
Dust From Material Movement	—	—	—	—	—	—	0.22	0.22	—	0.08	0.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.04	0.70	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	172	172	< 0.005	0.01	175
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	3.35	1.20	62.3	22.0	0.35	1.01	14.2	15.2	0.67	3.88	4.55	—	51,619	51,619	2.09	8.29	54,243
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.63	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	159	159	< 0.005	0.01	161
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	3.27	1.13	66.0	22.3	0.35	1.01	14.2	15.2	0.67	3.88	4.55	—	51,644	51,644	2.09	8.29	54,168
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.9	19.9	< 0.005	< 0.005	20.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.41	0.15	7.97	2.73	0.04	0.12	1.72	1.84	0.08	0.47	0.55	—	6,365	6,365	0.26	1.02	6,682
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.29	3.29	< 0.005	< 0.005	3.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.07	0.03	1.45	0.50	0.01	0.02	0.31	0.34	0.02	0.09	0.10	—	1,054	1,054	0.04	0.17	1,106

3.6. Grading (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	3.79	3.79	—	1.46	1.46	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	3.79	3.79	—	1.46	1.46	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.15	3.36	0.01	0.13	—	0.13	0.12	—	0.12	—	813	813	0.03	0.01	816
Dust From Material Movement	—	—	—	—	—	—	0.47	0.47	—	0.18	0.18	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.58	0.61	< 0.005	0.02	—	0.02	0.02	—	0.02	—	135	135	0.01	< 0.005	135
Dust From Material Movement	—	—	—	—	—	—	0.09	0.09	—	0.03	0.03	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.04	0.70	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	172	172	< 0.005	0.01	175
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	3.35	1.20	62.3	22.0	0.35	1.01	14.2	15.2	0.67	3.88	4.55	—	51,619	51,619	2.09	8.29	54,243
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.63	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	159	159	< 0.005	0.01	161
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	3.27	1.13	66.0	22.3	0.35	1.01	14.2	15.2	0.67	3.88	4.55	—	51,644	51,644	2.09	8.29	54,168
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.9	19.9	< 0.005	< 0.005	20.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.41	0.15	7.97	2.73	0.04	0.12	1.72	1.84	0.08	0.47	0.55	—	6,365	6,365	0.26	1.02	6,682
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.29	3.29	< 0.005	< 0.005	3.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Hauling	0.07	0.03	1.45	0.50	0.01	0.02	0.31	0.34	0.02	0.09	0.10	—	1,054	1,054	0.04	0.17	1,106

3.7. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.54	4.89	6.73	0.01	0.18	—	0.18	0.16	—	0.16	—	1,248	1,248	0.05	0.01	1,252
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.89	1.23	< 0.005	0.03	—	0.03	0.03	—	0.03	—	207	207	0.01	< 0.005	207
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.20	2.92	1.90	30.5	0.00	0.00	7.16	7.16	0.00	1.68	1.68	—	7,464	7,464	0.13	0.28	7,577
Vendor	0.62	0.30	11.5	4.55	0.07	0.13	2.55	2.69	0.13	0.71	0.84	—	9,329	9,329	0.31	1.41	9,775
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.08	2.78	2.48	27.3	0.00	0.00	7.16	7.16	0.00	1.68	1.68	—	6,902	6,902	0.19	0.30	6,997
Vendor	0.60	0.29	12.1	4.70	0.07	0.13	2.55	2.69	0.13	0.71	0.84	—	9,336	9,336	0.31	1.41	9,763
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.59	1.43	1.14	13.8	0.00	0.00	3.65	3.65	0.00	0.85	0.85	—	3,637	3,637	0.09	0.16	3,691
Vendor	0.32	0.15	6.20	2.40	0.03	0.07	1.30	1.37	0.07	0.36	0.43	—	4,858	4,858	0.16	0.73	5,084
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29	0.26	0.21	2.51	0.00	0.00	0.67	0.67	0.00	0.16	0.16	—	602	602	0.01	0.03	611
Vendor	0.06	0.03	1.13	0.44	0.01	0.01	0.24	0.25	0.01	0.07	0.08	—	804	804	0.03	0.12	842
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.54	4.89	6.73	0.01	0.18	—	0.18	0.16	—	0.16	—	1,248	1,248	0.05	0.01	1,252
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.89	1.23	< 0.005	0.03	—	0.03	0.03	—	0.03	—	207	207	0.01	< 0.005	207
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.20	2.92	1.90	30.5	0.00	0.00	7.16	7.16	0.00	1.68	1.68	—	7,464	7,464	0.13	0.28	7,577
Vendor	0.62	0.30	11.5	4.55	0.07	0.13	2.55	2.69	0.13	0.71	0.84	—	9,329	9,329	0.31	1.41	9,775
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.08	2.78	2.48	27.3	0.00	0.00	7.16	7.16	0.00	1.68	1.68	—	6,902	6,902	0.19	0.30	6,997

Vendor	0.60	0.29	12.1	4.70	0.07	0.13	2.55	2.69	0.13	0.71	0.84	—	9,336	9,336	0.31	1.41	9,763
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.59	1.43	1.14	13.8	0.00	0.00	3.65	3.65	0.00	0.85	0.85	—	3,637	3,637	0.09	0.16	3,691
Vendor	0.32	0.15	6.20	2.40	0.03	0.07	1.30	1.37	0.07	0.36	0.43	—	4,858	4,858	0.16	0.73	5,084
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29	0.26	0.21	2.51	0.00	0.00	0.67	0.67	0.00	0.16	0.16	—	602	602	0.01	0.03	611
Vendor	0.06	0.03	1.13	0.44	0.01	0.01	0.24	0.25	0.01	0.07	0.08	—	804	804	0.03	0.12	842
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	0.31	2.76	4.00	0.01	0.09	—	0.09	0.09	—	0.09	—	741	741	0.03	0.01	744
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.50	0.73	< 0.005	0.02	—	0.02	0.02	—	0.02	—	123	123	< 0.005	< 0.005	123
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.12	2.84	1.63	28.8	0.00	0.00	7.16	7.16	0.00	1.68	1.68	—	7,325	7,325	0.13	0.28	7,437
Vendor	0.61	0.29	11.0	4.41	0.07	0.13	2.55	2.69	0.13	0.71	0.84	—	9,107	9,107	0.31	1.33	9,529
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.99	2.69	2.23	25.7	0.00	0.00	7.16	7.16	0.00	1.68	1.68	—	6,775	6,775	0.19	0.30	6,870
Vendor	0.60	0.29	11.6	4.55	0.07	0.13	2.55	2.69	0.13	0.71	0.84	—	9,114	9,114	0.31	1.34	9,521
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.91	0.83	0.60	7.68	0.00	0.00	2.17	2.17	0.00	0.51	0.51	—	2,120	2,120	0.05	0.09	2,152
Vendor	0.19	0.09	3.52	1.38	0.02	0.04	0.77	0.82	0.04	0.21	0.26	—	2,817	2,817	0.09	0.41	2,945
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.15	0.11	1.40	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	351	351	0.01	0.02	356

Vendor	0.03	0.02	0.64	0.25	< 0.005	0.01	0.14	0.15	0.01	0.04	0.05	—	466	466	0.02	0.07	488
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	0.31	2.76	4.00	0.01	0.09	—	0.09	0.09	—	0.09	—	741	741	0.03	0.01	744
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.50	0.73	< 0.005	0.02	—	0.02	0.02	—	0.02	—	123	123	< 0.005	< 0.005	123
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.12	2.84	1.63	28.8	0.00	0.00	7.16	7.16	0.00	1.68	1.68	—	7,325	7,325	0.13	0.28	7,437
Vendor	0.61	0.29	11.0	4.41	0.07	0.13	2.55	2.69	0.13	0.71	0.84	—	9,107	9,107	0.31	1.33	9,529
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.99	2.69	2.23	25.7	0.00	0.00	7.16	7.16	0.00	1.68	1.68	—	6,775	6,775	0.19	0.30	6,870
Vendor	0.60	0.29	11.6	4.55	0.07	0.13	2.55	2.69	0.13	0.71	0.84	—	9,114	9,114	0.31	1.34	9,521
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.91	0.83	0.60	7.68	0.00	0.00	2.17	2.17	0.00	0.51	0.51	—	2,120	2,120	0.05	0.09	2,152
Vendor	0.19	0.09	3.52	1.38	0.02	0.04	0.77	0.82	0.04	0.21	0.26	—	2,817	2,817	0.09	0.41	2,945
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.15	0.11	1.40	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	351	351	0.01	0.02	356
Vendor	0.03	0.02	0.64	0.25	< 0.005	0.01	0.14	0.15	0.01	0.04	0.05	—	466	466	0.02	0.07	488
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.82	0.69	6.63	9.91	0.01	0.26	—	0.26	0.24	—	0.24	—	1,511	1,511	0.06	0.01	1,516
Paving	11.2	11.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	41.5
Paving	0.31	0.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.85	6.85	< 0.005	< 0.005	6.88
Paving	0.06	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.50	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	129
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.25	3.25	< 0.005	< 0.005	3.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.54	0.54	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.12. Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.82	0.69	6.63	9.91	0.01	0.26	—	0.26	0.24	—	0.24	—	1,511	1,511	0.06	0.01	1,516
Paving	11.2	11.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	41.5
Paving	0.31	0.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.85	6.85	< 0.005	< 0.005	6.88
Paving	0.06	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.50	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	129
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.25	3.25	< 0.005	< 0.005	3.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.54	0.54	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.81	1.12	< 0.005	0.02	—	0.02	0.01	—	0.01	—	134	134	0.01	< 0.005	134
Architectural Coatings	732	732	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.66	3.66	< 0.005	< 0.005	3.67
Architectural Coatings	20.1	20.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.61	0.61	< 0.005	< 0.005	0.61
Architectural Coatings	3.66	3.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.57	0.33	5.76	0.00	0.00	1.43	1.43	0.00	0.34	0.34	—	1,465	1,465	0.03	0.06	1,487

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.14	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.6	37.6	< 0.005	< 0.005	38.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.22	6.22	< 0.005	< 0.005	6.31
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.14. Architectural Coating (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.81	1.12	< 0.005	0.02	—	0.02	0.01	—	0.01	—	134	134	0.01	< 0.005	134
Architectural Coatings	732	732	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.66	3.66	< 0.005	< 0.005	3.67
Architectural Coatings	20.1	20.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.61	0.61	< 0.005	< 0.005	0.61
Architectural Coatings	3.66	3.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.57	0.33	5.76	0.00	0.00	1.43	1.43	0.00	0.34	0.34	—	1,465	1,465	0.03	0.06	1,487
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.14	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.6	37.6	< 0.005	< 0.005	38.1

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.22	6.22	< 0.005	< 0.005	6.31
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	46.8	41.3	53.8	527	1.56	1.01	145	146	0.95	36.8	37.8	—	159,159	159,159	4.65	6.03	161,526
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	46.8	41.3	53.8	527	1.56	1.01	145	146	0.95	36.8	37.8	—	159,159	159,159	4.65	6.03	161,526
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Commercial	45.5	39.9	62.6	469	1.47	1.01	145	146	0.95	36.8	37.8	—	149,714	149,714	4.96	6.56	151,804
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	45.5	39.9	62.6	469	1.47	1.01	145	146	0.95	36.8	37.8	—	149,714	149,714	4.96	6.56	151,804
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	8.21	7.21	10.7	84.1	0.27	0.19	25.9	26.1	0.17	6.57	6.74	—	25,022	25,022	0.79	1.05	25,386
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	8.21	7.21	10.7	84.1	0.27	0.19	25.9	26.1	0.17	6.57	6.74	—	25,022	25,022	0.79	1.05	25,386

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	46.8	41.3	53.8	527	1.56	1.01	145	146	0.95	36.8	37.8	—	159,159	159,159	4.65	6.03	161,526

Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	46.8	41.3	53.8	527	1.56	1.01	145	146	0.95	36.8	37.8	—	159,159	159,159	4.65	6.03	161,526
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	45.5	39.9	62.6	469	1.47	1.01	145	146	0.95	36.8	37.8	—	149,714	149,714	4.96	6.56	151,804
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	45.5	39.9	62.6	469	1.47	1.01	145	146	0.95	36.8	37.8	—	149,714	149,714	4.96	6.56	151,804
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	8.21	7.21	10.7	84.1	0.27	0.19	25.9	26.1	0.17	6.57	6.74	—	25,022	25,022	0.79	1.05	25,386
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	8.21	7.21	10.7	84.1	0.27	0.19	25.9	26.1	0.17	6.57	6.74	—	25,022	25,022	0.79	1.05	25,386

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	13,800	13,800	2.23	0.27	13,936
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	3,290	3,290	0.53	0.06	3,323
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	17,090	17,090	2.76	0.34	17,259
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	13,800	13,800	2.23	0.27	13,936
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	3,290	3,290	0.53	0.06	3,323
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	17,090	17,090	2.76	0.34	17,259
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	2,285	2,285	0.37	0.04	2,307
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	545	545	0.09	0.01	550
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,829	2,829	0.46	0.06	2,857

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	13,809	13,809	2.23	0.27	13,946
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	3,315	3,315	0.54	0.07	3,348
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	17,125	17,125	2.77	0.34	17,294
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	13,800	13,800	2.23	0.27	13,936

Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	3,290	3,290	0.53	0.06	3,323
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	17,090	17,090	2.76	0.34	17,259
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	—	2,285	2,285	0.37	0.04	2,308
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	—	547	547	0.09	0.01	552
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,832	2,832	0.46	0.06	2,860

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	3,976	3,976	0.35	0.01	3,987
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	3,976	3,976	0.35	0.01	3,987

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	24,015	24,015	2.13	0.05	24,081
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	3,976	3,976	0.35	0.01	3,987
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	3,976	3,976	0.35	0.01	3,987

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	13.3	13.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.01	2.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	17.1	15.8	0.81	96.1	0.01	0.17	—	0.17	0.13	—	0.13	—	395	395	0.02	< 0.005	397
Total	32.4	31.1	0.81	96.1	0.01	0.17	—	0.17	0.13	—	0.13	—	395	395	0.02	< 0.005	397
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	13.3	13.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.01	2.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	2.43	2.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.37	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.54	1.42	0.07	8.65	< 0.005	0.02	—	0.02	0.01	—	0.01	—	32.3	32.3	< 0.005	< 0.005	32.4
Total	4.33	4.22	0.07	8.65	< 0.005	0.02	—	0.02	0.01	—	0.01	—	32.3	32.3	< 0.005	< 0.005	32.4

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	13.3	13.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.01	2.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	13.3	13.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	2.01	2.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	2.43	2.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.37	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	2.79	2.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	32.2	60.8	93.0	3.31	0.08	199
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	32.2	60.8	93.0	3.31	0.08	199

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	32.2	60.8	93.0	3.31	0.08	199
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	32.2	60.8	93.0	3.31	0.08	199

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Commercial	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	1/4/2027	1/15/2027	5.00	10.0	—
Site Preparation	Site Preparation	1/16/2027	2/5/2027	5.00	15.0	—
Grading	Grading	2/6/2027	4/9/2027	5.00	45.0	—
Building Construction	Building Construction	4/10/2027	6/6/2028	5.00	302	—
Paving	Paving	6/7/2028	6/20/2028	5.00	10.0	—
Architectural Coating	Architectural Coating	6/21/2028	7/4/2028	5.00	10.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38

Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40

Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	35.6	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT

Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	764	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	867	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	362	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	173	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	35.6	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	764	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	867	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	362	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—

Architectural Coating	Worker	173	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	994,190	315,449	111,632

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	30,900	—
Site Preparation	—	—	22.5	0.00	—
Grading	275,000	—	36.4	0.00	—
Paving	0.00	0.00	0.00	0.00	42.7

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
User Defined Commercial	0.00	0%
Enclosed Parking with Elevator	36.6	100%
Other Asphalt Surfaces	6.10	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2027	0.00	204	0.03	< 0.005
2028	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Commercial	8,216	8,216	8,216	2,998,737	206,531	206,531	206,531	75,383,884
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Commercial	8,216	8,216	8,216	2,998,737	206,531	206,531	206,531	75,383,884
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	994,190	315,449	111,632

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
User Defined Commercial	24,692,430	204	0.0330	0.0040	74,932,069
Enclosed Parking with Elevator	5,887,874	204	0.0330	0.0040	0.00
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
User Defined Commercial	24,692,430	204	0.0330	0.0040	74,932,069
Enclosed Parking with Elevator	5,887,874	204	0.0330	0.0040	0.00
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
User Defined Commercial	101,470,000	0.00
Enclosed Parking with Elevator	0.00	0.00
Other Asphalt Surfaces	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
User Defined Commercial	101,470,000	0.00
Enclosed Parking with Elevator	0.00	0.00

Other Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
User Defined Commercial	560	—
Enclosed Parking with Elevator	0.00	—
Other Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
User Defined Commercial	560	—
Enclosed Parking with Elevator	0.00	—
Other Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	4.00	0.20	72.0	4,675	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
Boiler - CNG (0–2 MMBTU)	Electric	4.00	0.50	—	—

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	14.2	annual days of extreme heat

Extreme Precipitation	5.55	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	16.6	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	2	0	0	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	2	1	1	3
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	14.9
AQ-PM	32.1
AQ-DPM	18.5
Drinking Water	40.7
Lead Risk Housing	2.91
Pesticides	49.1

Toxic Releases	74.0
Traffic	67.8
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	47.4
Haz Waste Facilities/Generators	28.3
Impaired Water Bodies	23.9
Solid Waste	0.00
Sensitive Population	—
Asthma	86.9
Cardio-vascular	50.3
Low Birth Weights	21.8
Socioeconomic Factor Indicators	—
Education	17.8
Housing	1.29
Linguistic	32.0
Poverty	17.5
Unemployment	33.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	89.11843963
Employed	47.36301809
Median HI	95.72693443
Education	—

Bachelor's or higher	73.74566919
High school enrollment	17.07943026
Preschool enrollment	65.54600282
Transportation	—
Auto Access	94.58488387
Active commuting	38.47042217
Social	—
2-parent households	65.84113948
Voting	69.0619787
Neighborhood	—
Alcohol availability	87.18080328
Park access	62.23533941
Retail density	9.187732581
Supermarket access	2.399589375
Tree canopy	73.38637239
Housing	—
Homeownership	99.51238291
Housing habitability	92.33927884
Low-inc homeowner severe housing cost burden	90.00384961
Low-inc renter severe housing cost burden	66.09778006
Uncrowded housing	62.77428461
Health Outcomes	—
Insured adults	81.62453484
Arthritis	49.4
Asthma ER Admissions	13.4
High Blood Pressure	31.6
Cancer (excluding skin)	49.7

Asthma	83.3
Coronary Heart Disease	79.3
Chronic Obstructive Pulmonary Disease	84.0
Diagnosed Diabetes	51.3
Life Expectancy at Birth	70.4
Cognitively Disabled	62.4
Physically Disabled	86.7
Heart Attack ER Admissions	40.6
Mental Health Not Good	82.3
Chronic Kidney Disease	79.8
Obesity	75.7
Pedestrian Injuries	19.6
Physical Health Not Good	76.2
Stroke	70.4
Health Risk Behaviors	—
Binge Drinking	88.4
Current Smoker	77.7
No Leisure Time for Physical Activity	61.3
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	56.6
Elderly	50.2
English Speaking	83.2
Foreign-born	75.7
Outdoor Workers	74.5
Climate Change Adaptive Capacity	—

Impervious Surface Cover	68.4
Traffic Density	47.7
Traffic Access	23.0
Other Indices	—
Hardship	22.7
Other Decision Support	—
2016 Voting	65.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	25.0
Healthy Places Index Score for Project Location (b)	86.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification

Land Use	See Project Description.
Construction: Construction Phases	See Project Description. 18-month construction duration, beginning in 2027.
Operations: Vehicle Data	See Traffic Study.
Operations: Water and Waste Water	See Project Description.
Operations: Energy Use	User Defined Commercial based on CalEEMod default values for quality restaurant use.
Operations: Solid Waste	User Defined Commercial based on CalEEMod Default values for Quality Restaurant energy use.
Construction: Dust From Material Movement	See Grading and Stormwater Report.
Operations: Emergency Generators and Fire Pumps	See Project Description.
Operations: Generators + Pumps EF	From manufacturers manual.

Scotts Valley Casino and Housing Project Alternative B Custom Report

Table of Contents

2. Emissions Summary

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	29.9	26.5	27.2	375	1.28	0.49	145	146	0.46	36.7	37.2	—	130,209	130,209	2.84	4.19	131,565
Area	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,139	41,139	4.90	0.38	41,375
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	54.1	49.0	74.7	394	1.43	2.93	145	148	2.90	36.7	39.6	496	174,856	175,352	58.0	5.07	178,351
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	28.8	25.5	31.9	321	1.20	0.49	145	146	0.46	36.7	37.2	—	122,070	122,070	2.92	4.57	123,506
Area	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,105	41,105	4.89	0.38	41,340
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Stationary	6.74	6.14	27.4	1.81	0.03	0.90	0.00	0.90	0.90	0.00	0.90	0.00	3,140	3,140	0.13	0.02	3,150
Total	53.1	48.0	79.5	340	1.35	2.93	145	148	2.90	36.7	39.6	496	166,682	167,178	58.1	5.46	170,257
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	28.9	25.5	29.8	323	1.21	0.49	142	142	0.46	35.9	36.4	—	123,305	123,305	2.87	4.40	124,704
Area	15.3	15.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	2.21	1.11	20.1	16.9	0.12	1.53	—	1.53	1.53	—	1.53	—	41,122	41,122	4.89	0.38	41,358
Water	—	—	—	—	—	—	—	—	—	—	—	194	367	562	20.0	0.48	1,205
Waste	—	—	—	—	—	—	—	—	—	—	—	302	0.00	302	30.1	0.00	1,055
Stationary	6.65	6.05	27.1	1.78	0.03	0.89	0.00	0.89	0.89	0.00	0.89	0.00	3,097	3,097	0.12	0.02	3,107
Total	53.0	48.0	77.0	341	1.36	2.91	142	145	2.88	35.9	38.8	496	167,891	168,387	58.0	5.28	171,428
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.27	4.65	5.45	58.9	0.22	0.09	25.9	26.0	0.08	6.55	6.63	—	20,415	20,415	0.48	0.73	20,646
Area	2.79	2.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.40	0.20	3.67	3.09	0.02	0.28	—	0.28	0.28	—	0.28	—	6,808	6,808	0.81	0.06	6,847
Water	—	—	—	—	—	—	—	—	—	—	—	32.2	60.8	93.0	3.31	0.08	199
Waste	—	—	—	—	—	—	—	—	—	—	—	49.9	0.00	49.9	4.99	0.00	175
Stationary	1.21	1.10	4.94	0.33	0.01	0.16	0.00	0.16	0.16	0.00	0.16	0.00	513	513	0.02	< 0.005	514
Total	9.68	8.75	14.1	62.3	0.25	0.53	25.9	26.4	0.53	6.55	7.08	82.1	27,796	27,878	9.61	0.87	28,382

5. Activity Data

5.9. Operational Mobile Sources

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Commercial	8,216	8,216	8,216	2,998,737	206,531	206,531	206,531	75,383,884
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Scotts Valley Casino and Housing Project Alternative C Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Scotts Valley Casino and Housing Project Alternative C
Construction Start Date	1/4/2027
Operational Year	2029
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	34.8
Location	38.14089635133226, -122.21689298763143
County	Solano-San Francisco
City	Vallejo
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	860
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.25

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Single Family Housing	50.0	Dwelling Unit	16.2	97,500	585,643	—	141	—
General Office Building	23.4	1000sqft	0.54	23,353	—	—	—	—
Hotel	264	Room	8.80	141,012	—	—	—	—
Regional Shopping Center	130	1000sqft	2.98	129,702	—	—	—	—
Other Asphalt Surfaces	13.6	Acre	13.6	0.00	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-9	Use Dust Suppressants
Construction	C-10-A	Water Exposed Surfaces
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Area Sources	LL-1	Replace Gas Powered Landscape Equipment with Zero-Emission Landscape Equipment

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	461	461	30.6	29.8	0.09	1.12	10.5	11.7	1.01	4.01	5.02	—	10,919	10,919	0.44	0.73	11,156

Mit.	461	461	30.6	29.8	0.09	1.12	4.91	6.03	1.01	1.78	2.79	—	10,919	10,919	0.44	0.73	11,156
% Reduced	—	—	—	—	—	—	53%	48%	—	56%	44%	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.84	3.11	30.9	29.7	0.09	1.17	19.8	21.0	1.08	10.1	11.2	—	10,908	10,908	0.44	0.73	11,136
Mit.	3.84	3.11	30.9	29.7	0.09	1.17	7.81	8.98	1.08	3.97	5.05	—	10,908	10,908	0.44	0.73	11,136
% Reduced	—	—	—	—	—	—	61%	57%	—	61%	55%	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	13.3	13.2	11.6	14.5	0.03	0.40	2.94	3.34	0.36	1.11	1.47	—	4,227	4,227	0.16	0.24	4,306
Mit.	13.3	13.2	11.6	14.5	0.03	0.40	1.76	2.15	0.36	0.58	0.94	—	4,227	4,227	0.16	0.24	4,306
% Reduced	—	—	—	—	—	—	40%	36%	—	48%	36%	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.42	2.41	2.11	2.64	0.01	0.07	0.54	0.61	0.07	0.20	0.27	—	700	700	0.03	0.04	713
Mit.	2.42	2.41	2.11	2.64	0.01	0.07	0.32	0.39	0.07	0.11	0.17	—	700	700	0.03	0.04	713
% Reduced	—	—	—	—	—	—	40%	36%	—	48%	36%	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	3.85	3.11	30.6	29.8	0.09	1.12	10.5	11.7	1.01	4.01	5.02	—	10,919	10,919	0.44	0.73	11,156

2028	461	461	10.8	17.8	0.03	0.32	1.42	1.74	0.30	0.35	0.64	—	4,810	4,810	0.16	0.26	4,897
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	3.84	3.11	30.9	29.7	0.09	1.17	19.8	21.0	1.08	10.1	11.2	—	10,908	10,908	0.44	0.73	11,136
2028	1.71	1.43	11.0	17.3	0.03	0.32	1.42	1.74	0.30	0.35	0.64	—	4,731	4,731	0.17	0.26	4,813
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	1.62	1.34	11.6	14.5	0.03	0.40	2.94	3.34	0.36	1.11	1.47	—	4,227	4,227	0.16	0.24	4,306
2028	13.3	13.2	3.57	5.66	0.01	0.11	0.44	0.55	0.10	0.11	0.21	—	1,520	1,520	0.05	0.08	1,547
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.30	0.24	2.11	2.64	0.01	0.07	0.54	0.61	0.07	0.20	0.27	—	700	700	0.03	0.04	713
2028	2.42	2.41	0.65	1.03	< 0.005	0.02	0.08	0.10	0.02	0.02	0.04	—	252	252	0.01	0.01	256

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	3.85	3.11	30.6	29.8	0.09	1.12	4.91	6.03	1.01	1.78	2.79	—	10,919	10,919	0.44	0.73	11,156
2028	461	461	10.8	17.8	0.03	0.32	1.42	1.74	0.30	0.35	0.64	—	4,810	4,810	0.16	0.26	4,897
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	3.84	3.11	30.9	29.7	0.09	1.17	7.81	8.98	1.08	3.97	5.05	—	10,908	10,908	0.44	0.73	11,136
2028	1.71	1.43	11.0	17.3	0.03	0.32	1.42	1.74	0.30	0.35	0.64	—	4,731	4,731	0.17	0.26	4,813
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	1.62	1.34	11.6	14.5	0.03	0.40	1.76	2.15	0.36	0.58	0.94	—	4,227	4,227	0.16	0.24	4,306

2028	13.3	13.2	3.57	5.66	0.01	0.11	0.44	0.55	0.10	0.11	0.21	—	1,520	1,520	0.05	0.08	1,547
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.30	0.24	2.11	2.64	0.01	0.07	0.32	0.39	0.07	0.11	0.17	—	700	700	0.03	0.04	713
2028	2.42	2.41	0.65	1.03	< 0.005	0.02	0.08	0.10	0.02	0.02	0.04	—	252	252	0.01	0.01	256

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	36.4	34.7	21.6	129	0.28	0.61	23.8	24.4	0.59	6.02	6.60	232	32,132	32,364	25.3	1.48	33,733
Mit.	33.8	32.4	21.5	113	0.28	0.58	23.8	24.3	0.57	6.02	6.59	232	32,077	32,310	25.3	1.48	33,678
% Reduced	7%	7%	1%	12%	—	4%	—	< 0.5%	3%	—	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	32.7	31.1	23.6	117	0.27	0.58	23.8	24.3	0.57	6.02	6.59	232	30,556	30,788	25.5	1.61	32,131
Mit.	32.7	31.1	23.6	117	0.27	0.58	23.8	24.3	0.57	6.02	6.59	232	30,556	30,788	25.5	1.61	32,131
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	33.6	32.1	22.2	115	0.26	0.57	22.7	23.2	0.56	5.74	6.30	232	30,000	30,232	25.4	1.53	31,575
Mit.	32.4	30.9	22.2	107	0.26	0.56	22.7	23.2	0.55	5.74	6.29	232	29,973	30,205	25.4	1.53	31,548
% Reduced	4%	4%	< 0.5%	7%	—	2%	—	< 0.5%	2%	—	< 0.5%	—	< 0.5%	< 0.5%	—	—	< 0.5%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	6.14	5.85	4.06	21.0	0.05	0.10	4.14	4.24	0.10	1.05	1.15	38.5	4,967	5,005	4.20	0.25	5,228
Mit.	5.91	5.64	4.05	19.6	0.05	0.10	4.14	4.24	0.10	1.05	1.15	38.5	4,962	5,001	4.20	0.25	5,223
% Reduced	4%	4%	< 0.5%	7%	< 0.5%	2%	—	< 0.5%	2%	—	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	22.2	21.0	12.4	111	0.26	0.18	23.8	23.9	0.17	6.02	6.19	—	26,845	26,845	1.38	1.31	27,344
Area	12.2	12.0	0.30	15.7	< 0.005	0.04	—	0.04	0.03	—	0.03	0.00	271	271	0.01	< 0.005	271
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,111	4,111	0.48	0.04	4,134
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Stationary	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Total	36.4	34.7	21.6	129	0.28	0.61	23.8	24.4	0.59	6.02	6.60	232	32,132	32,364	25.3	1.48	33,733
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	21.1	19.8	14.5	115	0.25	0.18	23.8	23.9	0.17	6.02	6.19	—	25,329	25,329	1.65	1.44	25,803
Area	9.71	9.70	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,111	4,111	0.48	0.04	4,134
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222

Stationar	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Total	32.7	31.1	23.6	117	0.27	0.58	23.8	24.3	0.57	6.02	6.59	232	30,556	30,788	25.5	1.61	32,131
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	20.8	19.6	13.3	105	0.24	0.18	22.7	22.8	0.17	5.74	5.91	—	24,960	24,960	1.50	1.36	25,433
Area	10.9	10.8	0.07	7.71	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	34.9	34.9	< 0.005	< 0.005	35.0
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,111	4,111	0.48	0.04	4,134
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Stationary	1.66	1.51	6.77	0.45	0.01	0.22	0.00	0.22	0.22	0.00	0.22	0.00	774	774	0.03	0.01	777
Total	33.6	32.1	22.2	115	0.26	0.57	22.7	23.2	0.56	5.74	6.30	232	30,000	30,232	25.4	1.53	31,575
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.80	3.57	2.43	19.2	0.04	0.03	4.14	4.17	0.03	1.05	1.08	—	4,132	4,132	0.25	0.22	4,211
Area	2.00	1.98	0.01	1.41	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	5.77	5.77	< 0.005	< 0.005	5.79
Energy	0.04	0.02	0.38	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	681	681	0.08	0.01	684
Water	—	—	—	—	—	—	—	—	—	—	—	8.45	20.0	28.4	0.87	0.02	56.4
Waste	—	—	—	—	—	—	—	—	—	—	—	30.0	0.00	30.0	3.00	0.00	105
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36.7
Stationary	0.30	0.28	1.24	0.08	< 0.005	0.04	0.00	0.04	0.04	0.00	0.04	0.00	128	128	0.01	< 0.005	129
Total	6.14	5.85	4.06	21.0	0.05	0.10	4.14	4.24	0.10	1.05	1.15	38.5	4,967	5,005	4.20	0.25	5,228

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	22.2	21.0	12.4	111	0.26	0.18	23.8	23.9	0.17	6.02	6.19	—	26,845	26,845	1.38	1.31	27,344
Area	9.71	9.70	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,116	4,116	0.48	0.04	4,139
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Stationary	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Total	33.8	32.4	21.5	113	0.28	0.58	23.8	24.3	0.57	6.02	6.59	232	32,077	32,310	25.3	1.48	33,678
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	21.1	19.8	14.5	115	0.25	0.18	23.8	23.9	0.17	6.02	6.19	—	25,329	25,329	1.65	1.44	25,803
Area	9.71	9.70	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,111	4,111	0.48	0.04	4,134
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Stationary	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Total	32.7	31.1	23.6	117	0.27	0.58	23.8	24.3	0.57	6.02	6.59	232	30,556	30,788	25.5	1.61	32,131
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	20.8	19.6	13.3	105	0.24	0.18	22.7	22.8	0.17	5.74	5.91	—	24,960	24,960	1.50	1.36	25,433
Area	9.69	9.69	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	5.19	5.19	< 0.005	< 0.005	5.20
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,113	4,113	0.48	0.04	4,136
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341

Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Stationary	1.66	1.51	6.77	0.45	0.01	0.22	0.00	0.22	0.22	0.00	0.22	0.00	774	774	0.03	0.01	777
Total	32.4	30.9	22.2	107	0.26	0.56	22.7	23.2	0.55	5.74	6.29	232	29,973	30,205	25.4	1.53	31,548
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.80	3.57	2.43	19.2	0.04	0.03	4.14	4.17	0.03	1.05	1.08	—	4,132	4,132	0.25	0.22	4,211
Area	1.77	1.77	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.86	0.86	< 0.005	< 0.005	0.86
Energy	0.04	0.02	0.38	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	681	681	0.08	0.01	685
Water	—	—	—	—	—	—	—	—	—	—	—	8.45	20.0	28.4	0.87	0.02	56.4
Waste	—	—	—	—	—	—	—	—	—	—	—	30.0	0.00	30.0	3.00	0.00	105
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36.7
Stationary	0.30	0.28	1.24	0.08	< 0.005	0.04	0.00	0.04	0.04	0.00	0.04	0.00	128	128	0.01	< 0.005	129
Total	5.91	5.64	4.05	19.6	0.05	0.10	4.14	4.24	0.10	1.05	1.15	38.5	4,962	5,001	4.20	0.25	5,223

3. Construction Emissions Details

3.1. Demolition (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.64	2.21	19.9	18.6	0.03	0.80	—	0.80	0.73	—	0.73	—	3,427	3,427	0.14	0.03	3,439

Demolitio	—	—	—	—	—	—	3.18	3.18	—	0.48	0.48	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.55	0.51	< 0.005	0.02	—	0.02	0.02	—	0.02	—	93.9	93.9	< 0.005	< 0.005	94.2
Demolitio n	—	—	—	—	—	—	0.09	0.09	—	0.01	0.01	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	15.6
Demolitio n	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	119	119	< 0.005	0.01	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.15	0.05	3.08	1.04	0.02	0.05	0.66	0.71	0.03	0.18	0.21	—	2,407	2,407	0.10	0.39	2,524
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.31	3.31	< 0.005	< 0.005	3.36
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	65.9	65.9	< 0.005	0.01	69.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	11.5

3.2. Demolition (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.64	2.21	19.9	18.6	0.03	0.80	—	0.80	0.73	—	0.73	—	3,427	3,427	0.14	0.03	3,439
Demolition	—	—	—	—	—	—	3.18	3.18	—	0.48	0.48	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.55	0.51	< 0.005	0.02	—	0.02	0.02	—	0.02	—	93.9	93.9	< 0.005	< 0.005	94.2
Demolition	—	—	—	—	—	—	0.09	0.09	—	0.01	0.01	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.01	0.10	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	15.6
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	119	119	< 0.005	0.01	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.15	0.05	3.08	1.04	0.02	0.05	0.66	0.71	0.03	0.18	0.21	—	2,407	2,407	0.10	0.39	2,524
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.31	3.31	< 0.005	< 0.005	3.36
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	65.9	65.9	< 0.005	0.01	69.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	11.5

3.3. Site Preparation (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.63	3.05	28.0	28.3	0.05	1.17	—	1.17	1.08	—	1.08	—	5,298	5,298	0.21	0.04	5,316
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	1.15	1.16	< 0.005	0.05	—	0.05	0.04	—	0.04	—	218	218	0.01	< 0.005	218
Dust From Material Movement	—	—	—	—	—	—	0.81	0.81	—	0.42	0.42	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.21	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	36.0	36.0	< 0.005	< 0.005	36.2
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.08	0.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.55	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.80	5.80	< 0.005	< 0.005	5.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.96	0.96	< 0.005	< 0.005	0.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.4. Site Preparation (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.63	3.05	28.0	28.3	0.05	1.17	—	1.17	1.08	—	1.08	—	5,298	5,298	0.21	0.04	5,316

Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	1.15	1.16	< 0.005	0.05	—	0.05	0.04	—	0.04	—	218	218	0.01	< 0.005	218
Dust From Material Movement	—	—	—	—	—	—	0.32	0.32	—	0.16	0.16	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.21	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	36.0	36.0	< 0.005	< 0.005	36.2
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.55	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.80	5.80	< 0.005	< 0.005	5.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.96	0.96	< 0.005	< 0.005	0.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	9.25	9.25	—	3.66	3.66	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621

Dust From Material Movement	—	—	—	—	—	—	9.25	9.25	—	3.66	3.66	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.15	3.36	0.01	0.13	—	0.13	0.12	—	0.12	—	813	813	0.03	0.01	816
Dust From Material Movement	—	—	—	—	—	—	1.14	1.14	—	0.45	0.45	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.58	0.61	< 0.005	0.02	—	0.02	0.02	—	0.02	—	135	135	0.01	< 0.005	135
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.08	0.08	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.04	0.70	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	172	172	< 0.005	0.01	175
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.27	0.10	5.01	1.77	0.03	0.08	1.14	1.22	0.05	0.31	0.37	—	4,149	4,149	0.17	0.67	4,360
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.07	0.06	0.06	0.63	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	159	159	< 0.005	0.01	161
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.26	0.09	5.30	1.79	0.03	0.08	1.14	1.22	0.05	0.31	0.37	—	4,151	4,151	0.17	0.67	4,354
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.9	19.9	< 0.005	< 0.005	20.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.03	0.01	0.64	0.22	< 0.005	0.01	0.14	0.15	0.01	0.04	0.04	—	512	512	0.02	0.08	537
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.29	3.29	< 0.005	< 0.005	3.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.12	0.04	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	84.7	84.7	< 0.005	0.01	88.9

3.6. Grading (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	3.61	3.61	—	1.43	1.43	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	3.51	2.95	25.6	27.3	0.06	1.04	—	1.04	0.96	—	0.96	—	6,598	6,598	0.27	0.05	6,621
Dust From Material Movement	—	—	—	—	—	—	3.61	3.61	—	1.43	1.43	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.15	3.36	0.01	0.13	—	0.13	0.12	—	0.12	—	813	813	0.03	0.01	816
Dust From Material Movement	—	—	—	—	—	—	0.44	0.44	—	0.18	0.18	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.58	0.61	< 0.005	0.02	—	0.02	0.02	—	0.02	—	135	135	0.01	< 0.005	135
Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.03	0.03	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.04	0.70	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	172	172	< 0.005	0.01	175
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.27	0.10	5.01	1.77	0.03	0.08	1.14	1.22	0.05	0.31	0.37	—	4,149	4,149	0.17	0.67	4,360

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.63	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	159	159	< 0.005	0.01	161
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.26	0.09	5.30	1.79	0.03	0.08	1.14	1.22	0.05	0.31	0.37	—	4,151	4,151	0.17	0.67	4,354
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.9	19.9	< 0.005	< 0.005	20.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.03	0.01	0.64	0.22	< 0.005	0.01	0.14	0.15	0.01	0.04	0.04	—	512	512	0.02	0.08	537
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.29	3.29	< 0.005	< 0.005	3.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.12	0.04	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	84.7	84.7	< 0.005	0.01	88.9

3.7. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.54	4.89	6.73	0.01	0.18	—	0.18	0.16	—	0.16	—	1,248	1,248	0.05	0.01	1,252
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.89	1.23	< 0.005	0.03	—	0.03	0.03	—	0.03	—	207	207	0.01	< 0.005	207
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.47	0.42	0.28	4.44	0.00	0.00	1.04	1.04	0.00	0.24	0.24	—	1,087	1,087	0.02	0.04	1,103
Vendor	0.09	0.04	1.70	0.67	0.01	0.02	0.38	0.40	0.02	0.10	0.12	—	1,379	1,379	0.05	0.21	1,445
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.45	0.41	0.36	3.98	0.00	0.00	1.04	1.04	0.00	0.24	0.24	—	1,005	1,005	0.03	0.04	1,019
Vendor	0.09	0.04	1.80	0.70	0.01	0.02	0.38	0.40	0.02	0.10	0.12	—	1,380	1,380	0.05	0.21	1,443
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.21	0.17	2.00	0.00	0.00	0.53	0.53	0.00	0.12	0.12	—	530	530	0.01	0.02	538
Vendor	0.05	0.02	0.92	0.36	0.01	0.01	0.19	0.20	0.01	0.05	0.06	—	718	718	0.02	0.11	752

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.37	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	87.7	87.7	< 0.005	< 0.005	89.0
Vendor	0.01	< 0.005	0.17	0.06	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	119	119	< 0.005	0.02	124
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.54	4.89	6.73	0.01	0.18	—	0.18	0.16	—	0.16	—	1,248	1,248	0.05	0.01	1,252
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.12	0.10	0.89	1.23	< 0.005	0.03	—	0.03	0.03	—	0.03	—	207	207	0.01	< 0.005	207
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.47	0.42	0.28	4.44	0.00	0.00	1.04	1.04	0.00	0.24	0.24	—	1,087	1,087	0.02	0.04	1,103
Vendor	0.09	0.04	1.70	0.67	0.01	0.02	0.38	0.40	0.02	0.10	0.12	—	1,379	1,379	0.05	0.21	1,445
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.45	0.41	0.36	3.98	0.00	0.00	1.04	1.04	0.00	0.24	0.24	—	1,005	1,005	0.03	0.04	1,019
Vendor	0.09	0.04	1.80	0.70	0.01	0.02	0.38	0.40	0.02	0.10	0.12	—	1,380	1,380	0.05	0.21	1,443
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.21	0.17	2.00	0.00	0.00	0.53	0.53	0.00	0.12	0.12	—	530	530	0.01	0.02	538
Vendor	0.05	0.02	0.92	0.36	0.01	0.01	0.19	0.20	0.01	0.05	0.06	—	718	718	0.02	0.11	752
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.37	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	87.7	87.7	< 0.005	< 0.005	89.0
Vendor	0.01	< 0.005	0.17	0.06	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	119	119	< 0.005	0.02	124
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	0.31	2.76	4.00	0.01	0.09	—	0.09	0.09	—	0.09	—	741	741	0.03	0.01	744
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.50	0.73	< 0.005	0.02	—	0.02	0.02	—	0.02	—	123	123	< 0.005	< 0.005	123
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.45	0.41	0.24	4.20	0.00	0.00	1.04	1.04	0.00	0.24	0.24	—	1,067	1,067	0.02	0.04	1,083
Vendor	0.09	0.04	1.62	0.65	0.01	0.02	0.38	0.40	0.02	0.10	0.12	—	1,346	1,346	0.05	0.20	1,409
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.44	0.39	0.33	3.74	0.00	0.00	1.04	1.04	0.00	0.24	0.24	—	987	987	0.03	0.04	1,000
Vendor	0.09	0.04	1.72	0.67	0.01	0.02	0.38	0.40	0.02	0.10	0.12	—	1,347	1,347	0.05	0.20	1,407
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.09	1.12	0.00	0.00	0.32	0.32	0.00	0.07	0.07	—	309	309	0.01	0.01	313
Vendor	0.03	0.01	0.52	0.20	< 0.005	0.01	0.11	0.12	0.01	0.03	0.04	—	416	416	0.01	0.06	435
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.20	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	51.1	51.1	< 0.005	< 0.005	51.9
Vendor	0.01	< 0.005	0.10	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	68.9	68.9	< 0.005	0.01	72.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.18	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	0.31	2.76	4.00	0.01	0.09	—	0.09	0.09	—	0.09	—	741	741	0.03	0.01	744
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.50	0.73	< 0.005	0.02	—	0.02	0.02	—	0.02	—	123	123	< 0.005	< 0.005	123
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.45	0.41	0.24	4.20	0.00	0.00	1.04	1.04	0.00	0.24	0.24	—	1,067	1,067	0.02	0.04	1,083
Vendor	0.09	0.04	1.62	0.65	0.01	0.02	0.38	0.40	0.02	0.10	0.12	—	1,346	1,346	0.05	0.20	1,409
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.44	0.39	0.33	3.74	0.00	0.00	1.04	1.04	0.00	0.24	0.24	—	987	987	0.03	0.04	1,000
Vendor	0.09	0.04	1.72	0.67	0.01	0.02	0.38	0.40	0.02	0.10	0.12	—	1,347	1,347	0.05	0.20	1,407
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.09	1.12	0.00	0.00	0.32	0.32	0.00	0.07	0.07	—	309	309	0.01	0.01	313
Vendor	0.03	0.01	0.52	0.20	< 0.005	0.01	0.11	0.12	0.01	0.03	0.04	—	416	416	0.01	0.06	435

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.20	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	51.1	51.1	< 0.005	< 0.005	51.9
Vendor	0.01	< 0.005	0.10	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	68.9	68.9	< 0.005	0.01	72.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.82	0.69	6.63	9.91	0.01	0.26	—	0.26	0.24	—	0.24	—	1,511	1,511	0.06	0.01	1,516
Paving	3.56	3.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	41.5
Paving	0.10	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.85	6.85	< 0.005	< 0.005	6.88

Paving	0.02	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.50	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	129
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.25	3.25	< 0.005	< 0.005	3.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.54	0.54	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.12. Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.82	0.69	6.63	9.91	0.01	0.26	—	0.26	0.24	—	0.24	—	1,511	1,511	0.06	0.01	1,516
Paving	3.56	3.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	41.5
Paving	0.10	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.85	6.85	< 0.005	< 0.005	6.88
Paving	0.02	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.50	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	129
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.25	3.25	< 0.005	< 0.005	3.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.54	0.54	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.81	1.12	< 0.005	0.02	—	0.02	0.01	—	0.01	—	134	134	0.01	< 0.005	134
Architectural Coatings	461	461	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.66	3.66	< 0.005	< 0.005	3.67
Architectural Coatings	12.6	12.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.61	0.61	< 0.005	< 0.005	0.61
Architectural Coatings	2.30	2.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.05	0.84	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	213	213	< 0.005	0.01	217
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.47	5.47	< 0.005	< 0.005	5.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.91	0.91	< 0.005	< 0.005	0.92
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.14. Architectural Coating (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.81	1.12	< 0.005	0.02	—	0.02	0.01	—	0.01	—	134	134	0.01	< 0.005	134
Architectural Coatings	461	461	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.66	3.66	< 0.005	< 0.005	3.67
Architectural Coatings	12.6	12.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.61	0.61	< 0.005	< 0.005	0.61
Architectural Coatings	2.30	2.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.05	0.84	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	213	213	< 0.005	0.01	217
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.47	5.47	< 0.005	< 0.005	5.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.91	0.91	< 0.005	< 0.005	0.92
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	1.56	1.45	1.09	10.2	0.03	0.02	2.43	2.45	0.02	0.61	0.63	—	2,703	2,703	0.11	0.12	2,748
General Office Building	1.34	1.25	0.84	7.66	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,954	1,954	0.09	0.09	1,989
Hotel	9.18	8.61	5.76	52.7	0.13	0.09	12.0	12.1	0.08	3.04	3.12	—	13,430	13,430	0.61	0.62	13,666
Regional Shopping Center	10.1	9.69	4.72	40.9	0.09	0.06	7.60	7.66	0.06	1.92	1.98	—	8,758	8,758	0.57	0.49	8,941
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	22.2	21.0	12.4	111	0.26	0.18	23.8	23.9	0.17	6.02	6.19	—	26,845	26,845	1.38	1.31	27,344
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	1.49	1.38	1.28	9.91	0.02	0.02	2.43	2.45	0.02	0.61	0.63	—	2,546	2,546	0.13	0.13	2,588
General Office Building	1.27	1.18	0.98	7.69	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,842	1,842	0.10	0.10	1,875
Hotel	8.74	8.13	6.73	52.8	0.12	0.09	12.0	12.1	0.09	3.04	3.12	—	12,661	12,661	0.71	0.68	12,882
Regional Shopping Center	9.59	9.09	5.53	44.9	0.08	0.06	7.60	7.66	0.06	1.92	1.98	—	8,279	8,279	0.70	0.54	8,458
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	21.1	19.8	14.5	115	0.25	0.18	23.8	23.9	0.17	6.02	6.19	—	25,329	25,329	1.65	1.44	25,803
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.27	0.25	0.22	1.72	< 0.005	< 0.005	0.43	0.44	< 0.005	0.11	0.11	—	425	425	0.02	0.02	433

General Office Building	0.23	0.21	0.17	1.32	< 0.005	< 0.005	0.31	0.31	< 0.005	0.08	0.08	—	308	308	0.02	0.02	313
Hotel	1.58	1.47	1.15	9.05	0.02	0.02	2.14	2.16	0.02	0.54	0.56	—	2,115	2,115	0.11	0.11	2,152
Regional Shopping Center	1.72	1.64	0.90	7.16	0.01	0.01	1.25	1.26	0.01	0.32	0.33	—	1,285	1,285	0.10	0.08	1,313
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	3.80	3.57	2.43	19.2	0.04	0.03	4.14	4.17	0.03	1.05	1.08	—	4,132	4,132	0.25	0.22	4,211

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	1.56	1.45	1.09	10.2	0.03	0.02	2.43	2.45	0.02	0.61	0.63	—	2,703	2,703	0.11	0.12	2,748
General Office Building	1.34	1.25	0.84	7.66	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,954	1,954	0.09	0.09	1,989
Hotel	9.18	8.61	5.76	52.7	0.13	0.09	12.0	12.1	0.08	3.04	3.12	—	13,430	13,430	0.61	0.62	13,666
Regional Shopping Center	10.1	9.69	4.72	40.9	0.09	0.06	7.60	7.66	0.06	1.92	1.98	—	8,758	8,758	0.57	0.49	8,941
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	22.2	21.0	12.4	111	0.26	0.18	23.8	23.9	0.17	6.02	6.19	—	26,845	26,845	1.38	1.31	27,344

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	1.49	1.38	1.28	9.91	0.02	0.02	2.43	2.45	0.02	0.61	0.63	—	2,546	2,546	0.13	0.13	2,588
General Office Building	1.27	1.18	0.98	7.69	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,842	1,842	0.10	0.10	1,875
Hotel	8.74	8.13	6.73	52.8	0.12	0.09	12.0	12.1	0.09	3.04	3.12	—	12,661	12,661	0.71	0.68	12,882
Regional Shopping Center	9.59	9.09	5.53	44.9	0.08	0.06	7.60	7.66	0.06	1.92	1.98	—	8,279	8,279	0.70	0.54	8,458
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	21.1	19.8	14.5	115	0.25	0.18	23.8	23.9	0.17	6.02	6.19	—	25,329	25,329	1.65	1.44	25,803
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.27	0.25	0.22	1.72	< 0.005	< 0.005	0.43	0.44	< 0.005	0.11	0.11	—	425	425	0.02	0.02	433
General Office Building	0.23	0.21	0.17	1.32	< 0.005	< 0.005	0.31	0.31	< 0.005	0.08	0.08	—	308	308	0.02	0.02	313
Hotel	1.58	1.47	1.15	9.05	0.02	0.02	2.14	2.16	0.02	0.54	0.56	—	2,115	2,115	0.11	0.11	2,152
Regional Shopping Center	1.72	1.64	0.90	7.16	0.01	0.01	1.25	1.26	0.01	0.32	0.33	—	1,285	1,285	0.10	0.08	1,313
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	3.80	3.57	2.43	19.2	0.04	0.03	4.14	4.17	0.03	1.05	1.08	—	4,132	4,132	0.25	0.22	4,211

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	238	238	0.04	< 0.005	241
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	273	273	0.04	0.01	276
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	483	483	0.08	0.01	488
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	631	631	0.10	0.01	638
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,626	1,626	0.26	0.03	1,642
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	238	238	0.04	< 0.005	241
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	273	273	0.04	0.01	276
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	483	483	0.08	0.01	488
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	631	631	0.10	0.01	638

Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,626	1,626	0.26	0.03	1,642
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	39.4	39.4	0.01	< 0.005	39.8
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	45.2	45.2	0.01	< 0.005	45.7
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	80.0	80.0	0.01	< 0.005	80.7
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	105	105	0.02	< 0.005	106
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	269	269	0.04	0.01	272

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	239	239	0.04	< 0.005	241
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	274	274	0.04	0.01	276
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	485	485	0.08	0.01	490

Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	634	634	0.10	0.01	640
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,631	1,631	0.26	0.03	1,647
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	238	238	0.04	< 0.005	241
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	273	273	0.04	0.01	276
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	483	483	0.08	0.01	488
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	631	631	0.10	0.01	638
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,626	1,626	0.26	0.03	1,642
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	39.5	39.5	0.01	< 0.005	39.9
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	45.3	45.3	0.01	< 0.005	45.7
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	80.1	80.1	0.01	< 0.005	80.9
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	105	105	0.02	< 0.005	106

Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	270	270	0.04	0.01	272

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.37	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	466	466	0.04	< 0.005	467
General Office Building	0.02	0.01	0.18	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	216	216	0.02	< 0.005	217
Hotel	0.13	0.07	1.21	1.02	0.01	0.09	—	0.09	0.09	—	0.09	—	1,444	1,444	0.13	< 0.005	1,448
Regional Shopping Center	0.03	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	359	359	0.03	< 0.005	360
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	2,485	2,485	0.22	< 0.005	2,492
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.37	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	466	466	0.04	< 0.005	467
General Office Building	0.02	0.01	0.18	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	216	216	0.02	< 0.005	217

Hotel	0.13	0.07	1.21	1.02	0.01	0.09	—	0.09	0.09	—	0.09	—	1,444	1,444	0.13	< 0.005	1,448
Regional Shopping Center	0.03	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	359	359	0.03	< 0.005	360
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	2,485	2,485	0.22	< 0.005	2,492
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.01	< 0.005	0.07	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	77.2	77.2	0.01	< 0.005	77.4
General Office Building	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	35.8	35.8	< 0.005	< 0.005	35.9
Hotel	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	239	239	0.02	< 0.005	240
Regional Shopping Center	0.01	< 0.005	0.05	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	59.4	59.4	0.01	< 0.005	59.5
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.04	0.02	0.38	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	411	411	0.04	< 0.005	413

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.37	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	466	466	0.04	< 0.005	467

General Office Building	0.02	0.01	0.18	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	216	216	0.02	< 0.005	217
Hotel	0.13	0.07	1.21	1.02	0.01	0.09	—	0.09	0.09	—	0.09	—	1,444	1,444	0.13	< 0.005	1,448
Regional Shopping Center	0.03	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	359	359	0.03	< 0.005	360
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	2,485	2,485	0.22	< 0.005	2,492
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.37	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	466	466	0.04	< 0.005	467
General Office Building	0.02	0.01	0.18	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	216	216	0.02	< 0.005	217
Hotel	0.13	0.07	1.21	1.02	0.01	0.09	—	0.09	0.09	—	0.09	—	1,444	1,444	0.13	< 0.005	1,448
Regional Shopping Center	0.03	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	359	359	0.03	< 0.005	360
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	2,485	2,485	0.22	< 0.005	2,492
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.01	< 0.005	0.07	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	77.2	77.2	0.01	< 0.005	77.4
General Office Building	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	35.8	35.8	< 0.005	< 0.005	35.9

Hotel	0.02	0.01	0.22	0.19	< 0.005	0.02	—	0.02	0.02	—	0.02	—	239	239	0.02	< 0.005	240
Regional Shopping Center	0.01	< 0.005	0.05	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	59.4	59.4	0.01	< 0.005	59.5
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.04	0.02	0.38	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	411	411	0.04	< 0.005	413

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.02	0.01	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Consumer Products	8.43	8.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.26	1.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	2.54	2.35	0.13	15.6	< 0.005	0.02	—	0.02	0.02	—	0.02	—	60.2	60.2	< 0.005	< 0.005	60.4
Total	12.2	12.0	0.30	15.7	< 0.005	0.04	—	0.04	0.03	—	0.03	0.00	271	271	0.01	< 0.005	271
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.02	0.01	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211

Consume Products	8.43	8.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.26	1.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	9.71	9.70	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.86	0.86	< 0.005	< 0.005	0.86
Consumer Products	1.54	1.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.23	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.23	0.21	0.01	1.41	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.91	4.91	< 0.005	< 0.005	4.93
Total	2.00	1.98	0.01	1.41	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	5.77	5.77	< 0.005	< 0.005	5.79

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.02	0.01	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Consumer Products	8.43	8.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.26	1.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	9.71	9.70	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.02	0.01	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Consumer Products	8.43	8.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.26	1.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	9.71	9.70	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.86	0.86	< 0.005	< 0.005	0.86
Consumer Products	1.54	1.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.23	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.77	1.77	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.86	0.86	< 0.005	< 0.005	0.86

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	24.1	24.1	< 0.005	< 0.005	24.4

General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	51.1	96.4	147	5.25	0.13	316
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	24.1	24.1	< 0.005	< 0.005	24.4
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	51.1	96.4	147	5.25	0.13	316
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	4.00	4.00	< 0.005	< 0.005	4.04
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00

Hotel	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	8.45	16.0	24.4	0.87	0.02	52.4
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.45	20.0	28.4	0.87	0.02	56.4

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	24.1	24.1	< 0.005	< 0.005	24.4
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	51.1	96.4	147	5.25	0.13	316
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	24.1	24.1	< 0.005	< 0.005	24.4
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	51.1	96.4	147	5.25	0.13	316
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.00	4.00	4.00	< 0.005	< 0.005	4.04
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	8.45	16.0	24.4	0.87	0.02	52.4
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.45	20.0	28.4	0.87	0.02	56.4

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	64.0
General Office Building	—	—	—	—	—	—	—	—	—	—	—	11.7	0.00	11.7	1.17	0.00	41.0
Hotel	—	—	—	—	—	—	—	—	—	—	—	77.9	0.00	77.9	7.79	0.00	273
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	73.4	0.00	73.4	7.34	0.00	257
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	64.0
General Office Building	—	—	—	—	—	—	—	—	—	—	—	11.7	0.00	11.7	1.17	0.00	41.0
Hotel	—	—	—	—	—	—	—	—	—	—	—	77.9	0.00	77.9	7.79	0.00	273
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	73.4	0.00	73.4	7.34	0.00	257
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	3.03	0.00	3.03	0.30	0.00	10.6
General Office Building	—	—	—	—	—	—	—	—	—	—	—	1.94	0.00	1.94	0.19	0.00	6.78
Hotel	—	—	—	—	—	—	—	—	—	—	—	12.9	0.00	12.9	1.29	0.00	45.1
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	12.2	0.00	12.2	1.21	0.00	42.5
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	30.0	0.00	30.0	3.00	0.00	105

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	64.0
General Office Building	—	—	—	—	—	—	—	—	—	—	—	11.7	0.00	11.7	1.17	0.00	41.0
Hotel	—	—	—	—	—	—	—	—	—	—	—	77.9	0.00	77.9	7.79	0.00	273
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	73.4	0.00	73.4	7.34	0.00	257

Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	18.3	0.00	18.3	1.83	0.00	64.0
General Office Building	—	—	—	—	—	—	—	—	—	—	—	11.7	0.00	11.7	1.17	0.00	41.0
Hotel	—	—	—	—	—	—	—	—	—	—	—	77.9	0.00	77.9	7.79	0.00	273
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	73.4	0.00	73.4	7.34	0.00	257
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	3.03	0.00	3.03	0.30	0.00	10.6
General Office Building	—	—	—	—	—	—	—	—	—	—	—	1.94	0.00	1.94	0.19	0.00	6.78
Hotel	—	—	—	—	—	—	—	—	—	—	—	12.9	0.00	12.9	1.29	0.00	45.1
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	12.2	0.00	12.2	1.21	0.00	42.5
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	30.0	0.00	30.0	3.00	0.00	105

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.70
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	220
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.62
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.70
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	220

Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.62
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36.5
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.10
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36.7

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.70
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	220
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.62

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.70
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	220
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.62
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36.5
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.10
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36.7

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.30	0.28	1.24	0.08	< 0.005	0.04	0.00	0.04	0.04	0.00	0.04	0.00	128	128	0.01	< 0.005	129
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.30	0.28	1.24	0.08	< 0.005	0.04	0.00	0.04	0.04	0.00	0.04	0.00	128	128	0.01	< 0.005	129

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.30	0.28	1.24	0.08	< 0.005	0.04	0.00	0.04	0.04	0.00	0.04	0.00	128	128	0.01	< 0.005	129
Process Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.30	0.28	1.24	0.08	< 0.005	0.04	0.00	0.04	0.04	0.00	0.04	0.00	128	128	0.01	< 0.005	129

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequeste red	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequeste red	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	1/4/2027	1/15/2027	5.00	10.0	—
Site Preparation	Site Preparation	1/16/2027	2/5/2027	5.00	15.0	—
Grading	Grading	2/6/2027	4/9/2027	5.00	45.0	—
Building Construction	Building Construction	4/10/2027	6/6/2028	5.00	302	—
Paving	Paving	6/7/2028	6/20/2028	5.00	10.0	—
Architectural Coating	Architectural Coating	6/21/2028	7/4/2028	5.00	10.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73

Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2

Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	35.6	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	61.4	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	126	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	53.5	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	25.2	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT

Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	35.6	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	61.4	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	126	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	53.5	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT

Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	25.2	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	197,438	65,813	441,101	147,034	35,545

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	30,900	—
Site Preparation	—	—	22.5	0.00	—
Grading	22,100	—	40.2	0.00	—
Paving	0.00	0.00	0.00	0.00	14.2

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	0.55	0%
General Office Building	0.00	0%
Hotel	0.00	0%
Regional Shopping Center	0.00	0%
Other Asphalt Surfaces	13.6	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2027	0.00	204	0.03	< 0.005
2028	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	396	396	396	144,540	3,449	3,449	3,449	1,258,829
General Office Building	355	355	355	129,562	2,478	2,478	2,478	904,596
Hotel	2,439	2,439	2,439	890,366	17,031	17,031	17,031	6,216,479
Regional Shopping Center	2,978	2,978	2,978	1,086,955	9,658	10,792	10,792	3,643,377

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	396	396	396	144,540	3,449	3,449	3,449	1,258,829
General Office Building	355	355	355	129,562	2,478	2,478	2,478	904,596
Hotel	2,439	2,439	2,439	890,366	17,031	17,031	17,031	6,216,479
Regional Shopping Center	2,978	2,978	2,978	1,086,955	9,658	10,792	10,792	3,643,377
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	10
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	40
Conventional Wood Stoves	0
Catalytic Wood Stoves	0

Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	10
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	40
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
197437.5	65,813	441,101	147,034	35,545

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	426,285	204	0.0330	0.0040	1,454,501
General Office Building	488,763	204	0.0330	0.0040	674,178
Hotel	864,129	204	0.0330	0.0040	4,506,319
Regional Shopping Center	1,129,973	204	0.0330	0.0040	1,118,758
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	426,285	204	0.0330	0.0040	1,454,501
General Office Building	488,763	204	0.0330	0.0040	674,178
Hotel	864,129	204	0.0330	0.0040	4,506,319
Regional Shopping Center	1,129,973	204	0.0330	0.0040	1,118,758
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	—	8,752,776
General Office Building	—	0.00
Hotel	—	0.00
Regional Shopping Center	26,645,000	0.00
Other Asphalt Surfaces	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	—	8,752,776
General Office Building	—	0.00
Hotel	—	0.00
Regional Shopping Center	26,645,000	0.00
Other Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	33.9	—
General Office Building	21.7	—
Hotel	145	—
Regional Shopping Center	136	—
Other Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	33.9	—
General Office Building	21.7	—
Hotel	145	—
Regional Shopping Center	136	—
Other Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Hotel	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Hotel	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
Hotel	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Regional Shopping Center	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

Regional Shopping Center	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Hotel	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Hotel	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
Hotel	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Regional Shopping Center	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Regional Shopping Center	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	1.00	0.20	72.0	4,675	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
Boiler - CNG (0–2 MMBTU)	Electric	4.00	0.50	—	—

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	14.2	annual days of extreme heat
Extreme Precipitation	5.55	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	16.6	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	2	0	0	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	2	1	1	3
Sea Level Rise	1	1	1	2

Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	14.9
AQ-PM	32.1
AQ-DPM	18.5
Drinking Water	40.7
Lead Risk Housing	2.91
Pesticides	49.1
Toxic Releases	74.0
Traffic	67.8
Effect Indicators	—
CleanUp Sites	0.00

Groundwater	47.4
Haz Waste Facilities/Generators	28.3
Impaired Water Bodies	23.9
Solid Waste	0.00
Sensitive Population	—
Asthma	86.9
Cardio-vascular	50.3
Low Birth Weights	21.8
Socioeconomic Factor Indicators	—
Education	17.8
Housing	1.29
Linguistic	32.0
Poverty	17.5
Unemployment	33.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	89.11843963
Employed	47.36301809
Median HI	95.72693443
Education	—
Bachelor's or higher	73.74566919
High school enrollment	17.07943026
Preschool enrollment	65.54600282
Transportation	—

Auto Access	94.58488387
Active commuting	38.47042217
Social	—
2-parent households	65.84113948
Voting	69.0619787
Neighborhood	—
Alcohol availability	87.18080328
Park access	62.23533941
Retail density	9.187732581
Supermarket access	2.399589375
Tree canopy	73.38637239
Housing	—
Homeownership	99.51238291
Housing habitability	92.33927884
Low-inc homeowner severe housing cost burden	90.00384961
Low-inc renter severe housing cost burden	66.09778006
Uncrowded housing	62.77428461
Health Outcomes	—
Insured adults	81.62453484
Arthritis	49.4
Asthma ER Admissions	13.4
High Blood Pressure	31.6
Cancer (excluding skin)	49.7
Asthma	83.3
Coronary Heart Disease	79.3
Chronic Obstructive Pulmonary Disease	84.0
Diagnosed Diabetes	51.3

Life Expectancy at Birth	70.4
Cognitively Disabled	62.4
Physically Disabled	86.7
Heart Attack ER Admissions	40.6
Mental Health Not Good	82.3
Chronic Kidney Disease	79.8
Obesity	75.7
Pedestrian Injuries	19.6
Physical Health Not Good	76.2
Stroke	70.4
Health Risk Behaviors	—
Binge Drinking	88.4
Current Smoker	77.7
No Leisure Time for Physical Activity	61.3
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	56.6
Elderly	50.2
English Speaking	83.2
Foreign-born	75.7
Outdoor Workers	74.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	68.4
Traffic Density	47.7
Traffic Access	23.0
Other Indices	—

Hardship	22.7
Other Decision Support	—
2016 Voting	65.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	25.0
Healthy Places Index Score for Project Location (b)	86.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	See Project Description.
Construction: Construction Phases	See Project Description. 18-month construction duration starting in 2027.
Operations: Vehicle Data	See Traffic Study.
Operations: Water and Waste Water	See Project Description.

Construction: Dust From Material Movement	See Grading and Stormwater Report.
Operations: Emergency Generators and Fire Pumps	See Generator Assumptions.
Operations: Generators + Pumps EF	Based on Manufactures Assumptions.

Scotts Valley Casino and Housing Project Alternative C Custom Report

Table of Contents

2. Emissions Summary

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	14.1	13.4	7.04	77.8	0.22	0.09	23.7	23.8	0.08	6.00	6.08	—	21,983	21,983	0.82	0.95	22,292
Area	9.71	9.70	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,116	4,116	0.48	0.04	4,139
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Stationary	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Total	25.7	24.7	16.1	79.9	0.24	0.49	23.7	24.2	0.48	6.00	6.48	232	27,215	27,447	24.7	1.12	28,626
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	13.6	12.9	8.29	77.3	0.20	0.09	23.7	23.8	0.08	6.00	6.08	—	20,671	20,671	0.96	1.05	21,008
Area	9.71	9.70	0.17	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	211	211	< 0.005	< 0.005	211
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,111	4,111	0.48	0.04	4,134
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Stationary	1.69	1.53	6.86	0.45	0.01	0.23	0.00	0.23	0.23	0.00	0.23	0.00	785	785	0.03	0.01	788
Total	25.3	24.2	17.4	79.4	0.22	0.49	23.7	24.2	0.48	6.00	6.48	232	25,898	26,130	24.8	1.22	27,337

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	13.5	12.7	7.60	72.1	0.20	0.09	22.6	22.7	0.08	5.72	5.81	—	20,384	20,384	0.88	0.99	20,703
Area	9.69	9.69	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	5.19	5.19	< 0.005	< 0.005	5.20
Energy	0.23	0.11	2.06	1.58	0.01	0.16	—	0.16	0.16	—	0.16	—	4,113	4,113	0.48	0.04	4,136
Water	—	—	—	—	—	—	—	—	—	—	—	51.1	121	172	5.25	0.13	341
Waste	—	—	—	—	—	—	—	—	—	—	—	181	0.00	181	18.1	0.00	634
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	222
Stationary	1.66	1.51	6.77	0.45	0.01	0.22	0.00	0.22	0.22	0.00	0.22	0.00	774	774	0.03	0.01	777
Total	25.1	24.1	16.4	74.1	0.22	0.47	22.6	23.1	0.46	5.72	6.19	232	25,398	25,630	24.8	1.16	26,818
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.46	2.33	1.39	13.1	0.04	0.02	4.13	4.14	0.02	1.04	1.06	—	3,375	3,375	0.15	0.16	3,428
Area	1.77	1.77	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.86	0.86	< 0.005	< 0.005	0.86
Energy	0.04	0.02	0.38	0.29	< 0.005	0.03	—	0.03	0.03	—	0.03	—	681	681	0.08	0.01	685
Water	—	—	—	—	—	—	—	—	—	—	—	8.45	20.0	28.4	0.87	0.02	56.4
Waste	—	—	—	—	—	—	—	—	—	—	—	30.0	0.00	30.0	3.00	0.00	105
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36.7
Stationary	0.30	0.28	1.24	0.08	< 0.005	0.04	0.00	0.04	0.04	0.00	0.04	0.00	128	128	0.01	< 0.005	129
Total	4.57	4.39	3.00	13.5	0.04	0.09	4.13	4.21	0.08	1.04	1.13	38.5	4,205	4,243	4.10	0.19	4,440

Alternative A - Inputs

Input	Type of Input	Proposed Project	Source/Notes
Project Name	Project Name	Scotts Valley Casino and Housing Project	Project Description
Project Location	County	Solano – San Francisco	CalEEMod
Climate zone	Climate Zone Number		CalEEMod
Locational Context	Urban or Rural	Suburban	CalEEMod
Start of Construction	Date	2027, 18 months	Project Description
Operational Year	1st year of operation after full buildout.	2029	Project Description
Utility Company	Utility Company Name	PG&E	CalEEMod
Land Use Type and Subtype	Commercial, residential, parking	See **Table 1**	See **Table 1**
Unit Amount	Size of Buildings or Number of units for each Land Use Type.	See **Table 1**	See **Table 1**
Lot Acreage	Acreage of each Land Use Type	See **Table 1**	See **Table 1**
Population	Population based on persons/household	Default	Default
Construction Phases	Type of construction phase (Demo, Site Prep, etc.) and beginning and ending dates	See **Table 2**	See **Table 2**
Off-Road Equipment	Type of equipment (Excavator, Dozer, etc.) and number of units per construction phase	See **Table 2**	See **Table 2**
Dust From Material Haul	Import/Export Material (Cu Yd or Tons)	135,000 CY import	Grading and Stormwater Report (June 2024)
	Total Acres Graded	53.3	Grading and Stormwater Report (June 2024)
Demolition	Square feet of Demolition	30,900	Google Earth, 2024
Construction Trip Gen Rate	Average number of one-way trips per day	Default	Defaults
Operational Trip Reductions	% reduction in trips.	See **Table 3**	See **Table 3**
Operational Trip Gen Rate and trip length	Trips and trip lengths	See **Table 3**	See **Table 3**
Area Sources	Hearths – # of wood-burning fireplaces, # of gas fireplaces, and # of units with no fireplace.	NA	No hearths are included in project design.

Alternative A - Inputs (cont.)

Input	Type of Input	Proposed Project	Source/Notes
Energy Use	Project Specific Emission Factors.	See **Table 4**	See **Table 4**
Water and Wastewater	Indoor and outdoor water use for each Land Use Subtype in gallons per year.	See **Table 1**	See **Table 1**
Solid waste	Tons of solid waste generated per year	561.14 tons/year	Based on solid waste defaults for Quality Restaurant land use
	Land Fill No Gas Capture, Landfill Capture Gas Flare Rate		
Stationary Sources	Emergency Generators	Four 3,250 -KW (4,675 HP) emergency gensets operating 72 hours per year (CO EF 0.3)	Based on similar Projects + manufacturers assumptions
Stationary Sources	Boilers	Four 0.5-MMBtu/hr boilers	Based on similar projects
Land Use Change	Vegetation land use type (cropland, etc.) and initial and final acreage	Not Applicable	--
Sequestration	Type and net number of new trees added	Not Applicable	--

Alternative A – Construction Measures

Mitigation Input Category	CAPCOA Mitigation Number	Include in Model? (yes/no)	Type of Input / Unit	Project Specific Inputs	
				Inputs	Source/Notes
Use Electric or Hybrid Powered Equipment	C-1-A	No	Total # electric/hybrid		
Use Cleaner Fuel Equipment	C-1-B	No	Replace with CNG/gasoline		
Use Local Construction Contractors	C-3	No	Worker trip length (mi)		
Use Advance Engine Tiers	C-5	No	Mitigated engine tier & number/day		
Use Diesel Particulate Filters	C-6	No	% reduction		
Use Oxidation Catalyst	C-7	No	% reduction		
Use Renewable Diesel	C-8	No			
Use Dust Suppressant	C-9	**Yes**	PM10 (% reduction), PM2.5 (% reduction)		
Water Exposed Surfaces	C-10-A	**Yes**	Frequency, PM10 (% reduction), PM2.5 (% reduction)		
Water Active Demolition Sites	C-10-B	No	Frequency, PM10 (% reduction), PM2.5 (% reduction)		
Water Unpaved Construction Roads	C-10-C	No	PM10 (% reduction), PM2.5 (% reduction)		
Limit Vehicle Speeds on Unpaved Roads	C-11	**Yes**	PM10 (% reduction), PM2.5 (% reduction)		
Sweep Paved Roads	C-12	No	PM10 (% reduction), PM2.5 (% reduction)		
Use Low VOC Paints for Construction	C-13	No	Residential interior /exterior, non-residential interior/exterior, parking, EF (g/L)		
Limit Heavy-Duty Diesel Vehicle Idling	C-2	**Yes**	--		
Use Local and Sustainable Building Materials	C-4	No	--		

Table 1 – Land Use Inputs

Land Use Inputs								
Land Use Type	**Land Use Subtype[1]**	**Unit Amount**	**Size Metric**	**Lot Acreage**	**Square Feet**	**Landscape Area (acres)**	**Special Landscape Area**	**Water Demand (gal/yr)[2]**
Commercial	User Defined (Casino)[3]	614.949	ksf		614,959	5	0	104,755,000
Residential	Single Family Housing	24	units		46,800	1	0	
Commercial	General Office Building	12.555	ksf		12,555	0.5	0	
Parking	Enclosed Parking with Elevator	4068	spaces		1,595,011	0	0	
Parking	Other Asphalt Surfaces (roads)	8.4	acre		--	0	0	

Notes:
ksf = 1,000 square feet
1 - Source: Section 2, Project Description.
2 - Source: Water and Wastewater Feasibility Report

Table 2 – Construction Equipment

Equipment	Construction Phase Activities					
	Demolition (1/4/27 – 1/15/27)	**Site Preparation (1/16/27 – 2/5/27)**	**Grading (2/6/27 – 4/9/27)**	**Construction (4/10/27 – 6/6/28)**	**Paving (6/6/28 – 6/20/28)**	**Architectural Coating (6/21/28 – 7/4/28)**
All Heavy Equipment	Default	Default	Default	Default	Default	Default
Worker Trips	Default	Default	Default	Default	Default	Default
Soil Haul Trips	Default	Default	Default	Default	Default	Default
Soil Haul	Default	Default	Default	Default	Default	Default
Total Days	10	15	45	302	10	10

Table 3 – Trip Generation

Land Use Subtype	Daily Trip Generation Rate[1]		Average Trip Length (miles)[2]			Trip Type (%)[3]			Trip Purpose (%)[4]		
	Weekday	Saturday/ Sunday	Commercial-Customer Trips (O-O)	Commercial - Work Trips (W-O)	Commercial-Nonwork Trips (H-W)	Primary	Diverted	Pass-By	Commercial-Customer Trips(O-O)	Commercial-Work Trips (W-O)	Commercial-Nonwork Trips (H-W)
Commercial User Defined (Casino)	13.36	13.36	30	8.7	27.5	100	0	0	80	8	12
Single Family Housing	11.29	11.29	Default	Default	Default	Default	Default	Default	Default	Default	Default
Tribal Offices	5.18	5.18	Default	Default	Default	100	0	0	Default	Default	Default
Parking	0	0	Default	Default	Default	Default	Default	Default	Default	Default	Default

Notes:

1 Trip Generation Rates for Casino adjusted for consistency with Traffic Impact Analysis Report (Abrams Associates Traffic Engineering, INC, 2024).

2 Average trip length for non-work trips based on distance from Oakland area to project site. Average trip length for customer trips based on the market analysis (Advantage Partners Consulting, 2024).

3 All Trip Type percentages, with exception of the Casino, are CalEEMod default values. The Casino Trip Type percentage conservatively assumes that all trips are primary.

4 All Trip Purpose percentages, with the exception of the Casino, are CalEEMod default values. The Casino Trip Purpose is based on estimated employee and service trips.

Table 4 – Energy Use

Land Use Subtype	Total Annual Consumption for Electricity (kWh/yr)	Total Annual Consumption for Natural Gas (kBTU/yr)	Title 24 Electricity (kWh/yr)	Title-24 Natural Gas (kBTU/yr)	Non-title-24 Electricity kWh/yr	Non-title-24 Natural Gas (kBTU/yr)
Commercial User Defined (Casino)	24,692,430.46	74,932,069.12	8,872,363.38	16,210,531.38	15,820,067.08	58,721,537.77
Single Family Housing	Default	Default	Default	Default	Default	Default
Tribal Offices	Default	Default	Default	Default	Default	Default
Parking Lot	Default	Default	Default	Default	Default	Default

Notes: Casino based on CalEEMod default values for quality restaurant energy use.

Alternative B - Inputs

Input	Type of Input	Proposed Project	Source/Notes
Project Name	Project Name	Scotts Valley Casino and Housing Project	Project Description
Project Location	County	Solano – San Francisco	CalEEMod
Climate zone	Climate Zone Number		CalEEMod
Locational Context	Urban or Rural	Suburban	CalEEMod
Start of Construction	Date	2027, 18 months	Project Description
Operational Year	1st year of operation after full buildout.	2029	Project Description
Utility Company	Utility Company Name	PG&E	CalEEMod
Land Use Type and Subtype	Commercial, parking	See **Table 1**	See **Table 1**
Unit Amount	Size of Buildings or Number of units for each Land Use Type.	See **Table 1**	See **Table 1**
Lot Acreage	Acreage of each Land Use Type	See **Table 1**	See **Table 1**
Population	Population based on persons/household	Default	Default
Construction Phases	Type of construction phase (Demo, Site Prep, etc.) and beginning and ending dates	See **Table 2**	See **Table 2**
Off-Road Equipment	Type of equipment (Excavator, Dozer, etc.) and number of units per construction phase	See **Table 2**	See **Table 2**
Dust From Material Haul	Import/Export Material (Cu Yd or Tons)	275,000 CY import	Grading and Stormwater Report (June 2024)
	Total Acres Graded	36.4	Grading and Stormwater Report (June 2024)
Demolition	Square feet of Demolition	30,900	Google Earth, 2024
Construction Trip Gen Rate	Average number of one-way trips per day	Default	Defaults
Operational Trip Reductions	% reduction in trips.	See **Table 3**	See **Table 3**
Operational Trip Gen Rate and trip length	Trips and trip lengths	See **Table 3**	See **Table 3**
Area Sources	Hearths – # of wood-burning fireplaces, # of gas fireplaces, and # of units with no fireplace.	NA	No hearths are included in project design.

Alternative B - Inputs (cont.)

Input	Type of Input	Proposed Project	Source/Notes
Energy Use	Project Specific Emission Factors.	See **Table 4**	See **Table 4**
Water and Wastewater	Indoor and outdoor water use for each Land Use Subtype in gallons per year.	See **Table 1**	See **Table 1**
Solid waste	Tons of solid waste generated per year	561.14 tons/year	Based on solid waste defaults for Quality Restaurant land use
	Land Fill No Gas Capture, Landfill Capture Gas Flare Rate	Default	
Operational off-road equipment	Excavator, Dozer, etc.	--	--
Stationary Sources	Emergency Generators	Four 3,250 -KW (4,675 HP) emergency gensets operating 72 hours per year (CO EF 0.3)	Based on Similar Projects and manufacturers assumptions
Stationary Sources	Boilers	Four 0.5-MMBtu/hr boilers	Based on similar projects
Land Use Change	Vegetation land use type (cropland, etc.) and initial and final acreage	Not Applicable	GIS analysis
Sequestration	Type and net number of new trees added	Not Applicable	--

Alternative B – Construction Measures

Mitigation Input Category	CAPCOA Mitigation Number	Include in Model? (yes/no)	Type of Input / Unit	Project Specific Inputs	
				Inputs	Source/Notes
Use Electric or Hybrid Powered Equipment	C-1-A	No	Total # electric/hybrid		
Use Cleaner Fuel Equipment	C-1-B	No	Replace with CNG/gasoline		
Use Local Construction Contractors	C-3	No	Worker trip length (mi)		
Use Advance Engine Tiers	C-5	No	Mitigated engine tier & number/day		
Use Diesel Particulate Filters	C-6	No	% reduction		
Use Oxidation Catalyst	C-7	No	% reduction		
Use Renewable Diesel	C-8	No			
Use Dust Suppressant	C-9	**Yes**	PM10 (% reduction), PM2.5 (% reduction)		
Water Exposed Surfaces	C-10-A	**Yes**	Frequency, PM10 (% reduction), PM2.5 (% reduction)		
Water Active Demolition Sites	C-10-B	No	Frequency, PM10 (% reduction), PM2.5 (% reduction)		
Water Unpaved Construction Roads	C-10-C	No	PM10 (% reduction), PM2.5 (% reduction)		
Limit Vehicle Speeds on Unpaved Roads	C-11	**Yes**	PM10 (% reduction), PM2.5 (% reduction)		
Sweep Paved Roads	C-12	No	PM10 (% reduction), PM2.5 (% reduction)		
Use Low VOC Paints for Construction	C-13	No	Residential interior /exterior, non-residential interior/exterior, parking, EF (g/L)		
Limit Heavy-Duty Diesel Vehicle Idling	C-2	**Yes**	--		
Use Local and Sustainable Building Materials	C-4	No	--		

Table 1 – Land Use Inputs (Alt B)

Land Use Inputs								
Land Use Type	**Land Use Subtype[1]**	**Unit Amount**	**Size Metric**	**Lot Acreage**	**Square Feet**	**Landscape Area (acres)**	**Special Landscape Area**	**Water Demand (gal/yr)[2]**
Commercial	User Defined (Casino)	614.949	ksf		614,959	4	0	101,470,000
Parking	Enclosed Parking with Elevator	4068	spaces		1,595,011	0	0	
Parking	Other Asphalt Surfaces (roads)	6.1	acres			0	0	

Notes:
ksf = 1,000 square feet
1 - Source: Section 2, Project Description.
2 - Source: Water and Wastewater Feasibility Report

Table 2 – Construction Equipment (Alt B)

Equipment	Construction Phase Activities					
	Demolition (1/4/27 – 1/15/27)	**Site Preparation (1/16/27 – 2/5/27)**	**Grading (2/6/27 – 4/9/27)**	**Construction (4/10/27 – 6/6/28)**	**Paving (6/6/28 – 6/20/28)**	**Architectural Coating (6/21/28 – 7/4/28)**
All Heavy Equipment	Default	Default	Default	Default	Default	Default
Worker Trips	Default	Default	Default	Default	Default	Default
Soil Haul Trips	Default	Default	Default	Default	Default	Default
Soil Haul	Default	Default	Default	Default	Default	Default
Total Days	10	15	45	302	10	10

Table 3 – Trip Generation (Alt B)

Land Use Subtype	Daily Trip Generation Rate[1]		Average Trip Length (miles)[2]			Trip Type (%)[3]			Trip Purpose (%)[4]		
	Weekday	Saturday/ Sunday	Commercial-Customer Trips (O-O)	Commercial - Work Trips (W-O)	Commercial-Nonwork Trips (H-W)	Primary	Diverted	Pass-By	Commercial-Customer Trips(O-O)	Commercial-Work Trips (W-O)	Commercial-Nonwork Trips (H-W)
Commercial User Defined (Casino)	13.36	13.36	30	8.7	27.5	100	0	0	80	8	12
Parking	0	0	Default	Default	Default	Default	Default	Default	Default	Default	Default

Notes:

1 Trip Generation Rates for Casino adjusted for consistency with Traffic Impact Analysis Report (Abrams Associates Traffic Engineering, INC, 2024).

2 Average trip length for non-work trips based on distance from Oakland area to project site. Average trip length for customer trips based on the market analysis (Advantage Partners Consulting, 2024).

3 All Trip Type percentages, with exception of the Casino, are CalEEMod default values. The Casino Trip Type percentage conservatively assumes that all trips are primary.

4 All Trip Purpose percentages, with exception of the Casino, are CalEEMod default values. The Casino Trip Purpose is based on estimated employee and service trips.

Table 4 – Energy Use (Alt B)

Land Use Subtype	Total Annual Consumption for Electricity (kWh/yr)	Total Annual Consumption for Natural Gas (kBTU/yr)	Title 24 Electricity (kWh/yr)	Title-24 Natural Gas (kBTU/yr)	Non-title-24 Electricity kWh/yr	Non-title-24 Natural Gas (kBTU/yr)
Commercial User Defined (Casino)	24,692,430.46	74,932,069.12	8,872,363.38	16,210,531.38	15,820,067.08	58,721,537.77
Parking	Default	Default	Default	Default	Default	Default

Notes: Casino energy use based on CalEEMod default values for quality restaurant energy use.

Alternative C - Inputs

Input	Type of Input	Proposed Project	Source/Notes
Project Name	Project Name	Scotts Valley Casino and Housing Project	Project Description
Project Location	County	Solano – San Francisco	CalEEMod
Climate zone	Climate Zone Number		CalEEMod
Locational Context	Urban or Rural	Suburban	CalEEMod
Start of Construction	Date	2027, 18 months	Kickoff
Operational Year	1st year of operation after full buildout.	2029	Kickoff
Utility Company	Utility Company Name	PG&E	CalEEMod
Land Use Type and Subtype	Commercial, residential, parking	See **Table 1**	See **Table 1**
Unit Amount	Size of Buildings or Number of units for each Land Use Type.	See **Table 1**	See **Table 1**
Lot Acreage	Acreage of each Land Use Type	See **Table 1**	See **Table 1**
Population	Population based on persons/household	Default	Default
Construction Phases	Type of construction phase (Demo, Site Prep, etc.) and beginning and ending dates	See **Table 2**	See **Table 2**
Off-Road Equipment	Type of equipment (Excavator, Dozer, etc.) and number of units per construction phase	See **Table 2**	See **Table 2**
Dust From Material Haul	Import/Export Material (Cu Yd or Tons)	22,100 CY import	Grading and Stormwater Report (June 2024)
	Total Acres Graded	40.2	Grading and Stormwater Report (June 2024)
Demolition	Sq ft or tons of Demo (Tons or Sqft)	30,900	Google Earth, 2024
Construction Trip Gen Rate	Average number of one-way trips per day	Default	Defaults
Operational Trip Reductions	% reduction in trips.	See **Table 3**	See **Table 3**
Operational Trip Gen Rate and trip length	Trips and trip lengths	See **Table 3**	See **Table 3**
Area Sources	Hearths – # of wood-burning fireplaces, # of gas fireplaces, and # of units with no fireplace.	NA	No hearths are included in project design.

Alternative C - Inputs (cont.)

Input	Type of Input	Proposed Project	Source/Notes
Energy Use	Project Specific Emission Factors.	See **Table 4**	See **Table 4**
Water and Wastewater	Indoor and outdoor water use for each Land Use Subtype in gallons per year.	See **Table 1**	See **Table 1**
Solid waste	Tons of solid waste generated per year	Default	CalEEMod
	Land Fill No Gas Capture, Landfill Capture Gas Flare Rate	Default	CalEEMod
Operational off-road equipment	Excavator, Dozer, etc.	--	--
Stationary Sources	Emergency Generators	One 3,250-KW (4,675 HP) emergency gen sets operating 72 hours per year (CO EF 0.3)	Based on Similar Projects and Manufacturers Assumptions
Stationary Sources	Boilers	Four 0.5-MMBtu/hr boilers	Based on similar projects
Land Use Change	Vegetation land use type (cropland, etc.) and initial and final acreage	N/A	--
Sequestration	Type and net number of new trees added	Not Applicable	--

Alternative C – Construction Measures

Mitigation Input Category	CAPCOA Mitigation Number	Include in Model? (yes/no)	Type of Input / Unit	Project Specific Inputs	
				Inputs	Source/Notes
Use Electric or Hybrid Powered Equipment	C-1-A	No	Total # electric/hybrid		
Use Cleaner Fuel Equipment	C-1-B	No	Replace with CNG/gasoline		
Use Local Construction Contractors	C-3	No	Worker trip length (mi)		
Use Advance Engine Tiers	C-5	No	Mitigated engine tier & number/day		
Use Diesel Particulate Filters	C-6	No	% reduction		
Use Oxidation Catalyst	C-7	No	% reduction		
Use Renewable Diesel	C-8	No			

Use Dust Suppressant	C-9	**Yes**	PM10 (% reduction), PM2.5 (% reduction)		
Water Exposed Surfaces	C-10-A	**Yes**	Frequency, PM10 (% reduction), PM2.5 (% reduction)		
Water Active Demolition Sites	C-10-B	No	Frequency, PM10 (% reduction), PM2.5 (% reduction)		
Water Unpaved Construction Roads	C-10-C	No	PM10 (% reduction), PM2.5 (% reduction)		
Limit Vehicle Speeds on Unpaved Roads	C-11	**Yes**	PM10 (% reduction), PM2.5 (% reduction)		
Sweep Paved Roads	C-12	No	PM10 (% reduction), PM2.5 (% reduction)		
Use Low VOC Paints for Construction	C-13	No	Residential interior /exterior, non-residential interior/exterior, parking, EF (g/L)		
Limit Heavy-Duty Diesel Vehicle Idling	C-2	**Yes**	--		
Use Local and Sustainable Building Materials	C-4	No	--		

Table 1 – Land Use Inputs

Land Use Inputs								
Land Use Type	**Land Use Subtype[1]**	**Unit Amount**	**Size Metric**	**Lot Acreage**	**Square Feet**	**Landscape Area (acres)**	**Special Landscape Area**	**Water Demand (gal/yr)[2]**
Residential	Single Family Housing	50	units					26,645,000
Commercial	General Office Building	23.353	ksf		23,353			
Recreation	Hotel	264	Units		141,012			
Retail	Regional Shopping Center	129.702	ksf		129,702			
Parking	Other Asphalt Surfaces (roads)	13.6	acres		--			

Notes:
ksf = 1,000 square feet
1 - Source: Project Description.
2 - Source: Water and Wastewater Feasibility Report

Table 2 – Construction Equipment

Equipment	Construction Phase Activities					
	Demolition (1/4/27 – 1/15/27)	Site Preparation (1/16/27 – 2/5/27)	Grading (2/6/27 – 4/9/27)	Construction (4/10/27 – 6/6/28)	Paving (6/6/28 – 6/20/28)	Architectural Coating (6/21/28 – 7/4/28)
All Heavy Equipment	Default	Default	Default	Default	Default	Default
Worker Trips	Default	Default	Default	Default	Default	Default
Soil Haul Trips	Default	Default	Default	Default	Default	Default
Soil Haul	Default	Default	Default	Default	Default	Default
Total Days	10	15	45	302	10	10

Table 3 – Trip Generation

Land Use Subtype	Daily Trip Generation Rate[1]		Average Trip Length (miles)[2]			Trip Type (%)[3]			Trip Purpose (%)[4]		
	Weekday	Saturday/Sunday	Commercial-Customer Trips (C-C)	Commercial-Work Trips (C-W)	Commercial-Nonwork Trips (C-NW)	Primary	Diverted	Pass-By	Commercial-Customer Trips(O-O)	Commercial-Work Trips (C-W)	Commercial-Nonwork Trips (C-NW)
Hotel	9.24	9.24	Default	Default	Default	Default	Default	Default	Default	Default	Default
Single Family Housing	7.92	7.92	Default	Default	Default	Default	Default	Default	Default	Default	Default
General Office Building	15.2	15.2	Default	Default	Default	Default	Default	Default	Default	Default	Default
Regional Shopping Center	22.96	22.96	Default	Default	Default	Default	Default	Default	Default	Default	Default

Notes:

1 Trip Generation Rates for Casino adjusted for consistency with Traffic Impact Analysis Report (Abrams Associates, 2024).

2 Average trip length for non-work trips based on distance from Oakland area to project site. Average trip length for customer trips based on the market analysis (Advantage Partners Consulting, 2024).

3 All Trip Type percentages are CalEEMod default values.

4 All Trip Purpose percentages are CalEEMod default values.

Table 4 – Energy Use

Land Use Subtype	Title-24 Electricity Energy Intensity (KWhr/size/yr)	Nontitle-24 Electricity Energy Intensity (KWhr/size/yr)	Lighting Energy Intensity (KWhr/size/yr)	Title-24 Natural Gas Intensity (KBtu/size/yr)	Non-title-24 Natural Gas Intensity (KBtu/size/yr)
Hotel	Default	Default	Default	Default	Default
Single Family Housing	Default	Default	Default	Default	Default
General Office Building	Default	Default	Default	Default	Default
Regional Shopping Center	Default	Default	Default	Default	Default

Appendix H-1

Biological Assessment

BIOLOGICAL ASSESSMENT

Scotts Valley 160-acre Fee-to-Trust Project

Prepared for: U.S. Fish and Wildlife Service
June 2024

acorn environmental

Table of Contents

List of Figures

List of Attachments

List of Attachments

Section 1 | Introduction

1.1 PURPOSE OF ASSESSMENT

The purpose of this biological assessment (BA) is to evaluate the potential effects of the proposed Scotts Valley Band of Pomo Indians (Tribe) 160-acre Vallejo Fee-to-Trust Project (Proposed Action) on species listed as endangered or threatened under the Federal Endangered Species Act (ESA). This biological assessment has been prepared in accordance with legal requirements found in Section 7 (a)(2) of the ESA (16 U.S.C 1536(c)). The purpose of a biological assessment is to evaluate the potential effects of an action on species listed and proposed for listing, as well as designated or proposed Critical Habitat, and to determine whether any such species or habitat are likely to be adversely affected by the action.

1.2 DESCRIPTION OF PROPOSED ACTION AND ACTION AREA

Action Area

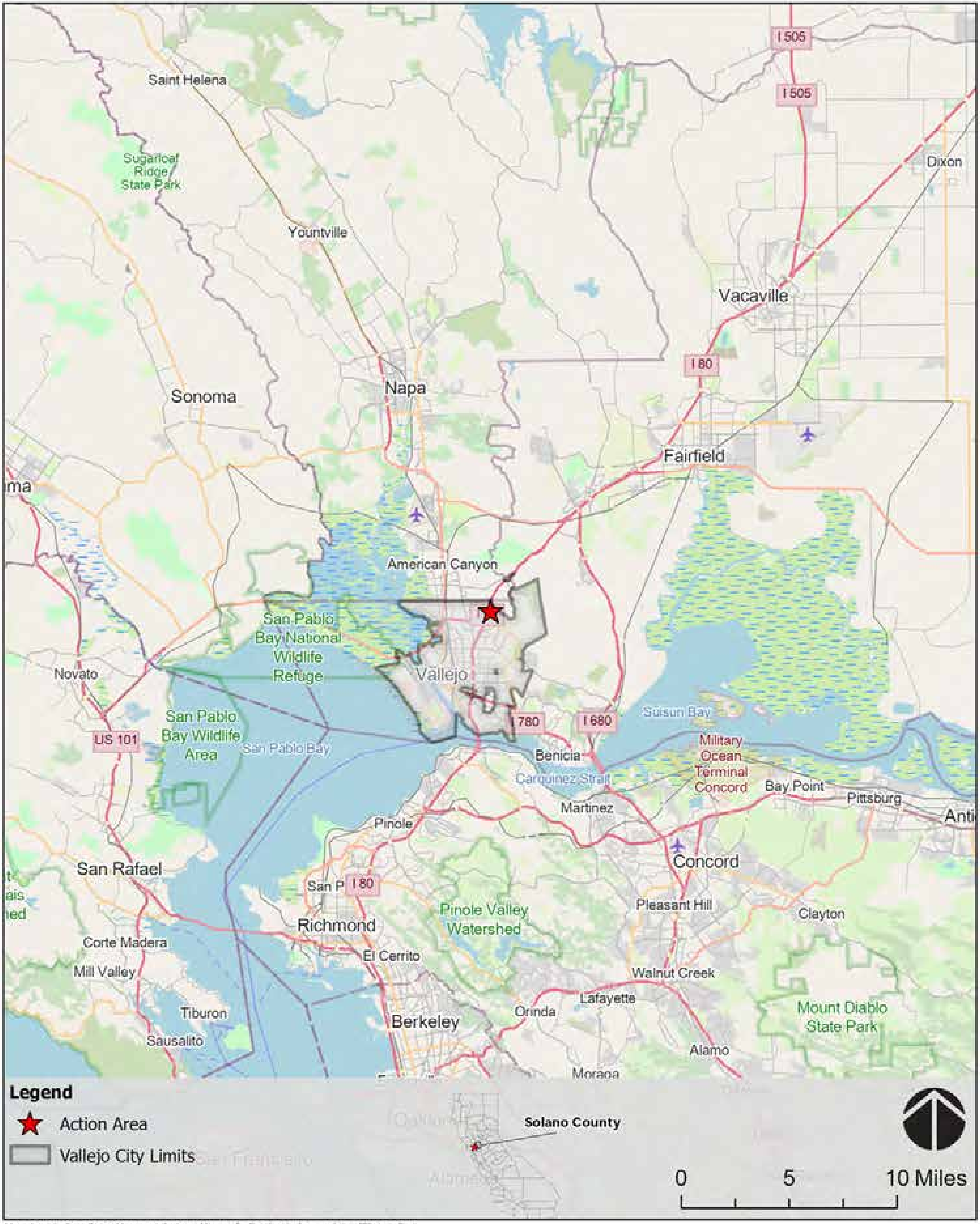
The Scotts Valley Band of Pomo Indians (Tribe) has submitted an application to the U.S. Bureau of Indian Affairs (BIA) to acquire into trust four parcels, Assessor's Parcel Number (APN) 0182-010-010, 0182-020-020, 0182-020-080, and 0182-020-010, which total approximately 160 acres (proposed fee-to-trust property) and are located within the City of Vallejo, Solano County, California. The Action Area includes the totality of the proposed fee-to-trust property. Following acquisition into trust, the Tribe intends to develop the Action Area for the purposes of gaming and economic development. **Figure 1** and **Figure 2** show the location of the Action Area, and **Figure 3** presents an aerial photograph of the Action Area and the immediate vicinity. The Action Area is located at the northeast corner of the intersection of Interstate 80 (I-80) and Columbus Parkway in Section 5, Township 3 North, Range 3 West, and Section 32, Township 4 North, Range 3 West, Mount Diablo Base and Meridian within the Cordelia 7.5-minute U.S. Geological Survey (USGS) quadrangle.

Proposed Action

The Proposed Action consists of the acquisition by the BIA of a 160-acre property within the City of Vallejo, Solano County, California into federal trust status for the Tribe. Following the acquisition of the land into trust, the Tribe proposes to develop a casino, Tribal housing, a Tribal administration building, and associated parking and infrastructure. A site plan is provided as **Figure 4**. The proposed casino would consist of eight stories and would include a gaming floor, restaurants, bars, and a ballroom/event space. Casino infrastructure would support guest and employee parking, a bus depot, a loading dock, and back-of house functions.

In addition to the casino complex, Tribal housing and community development is proposed in the northern portion of the Action Area, including 24 single-family residences and a Tribal administration building. The Tribal administration building would provide offices for up to 30 Tribal employees.

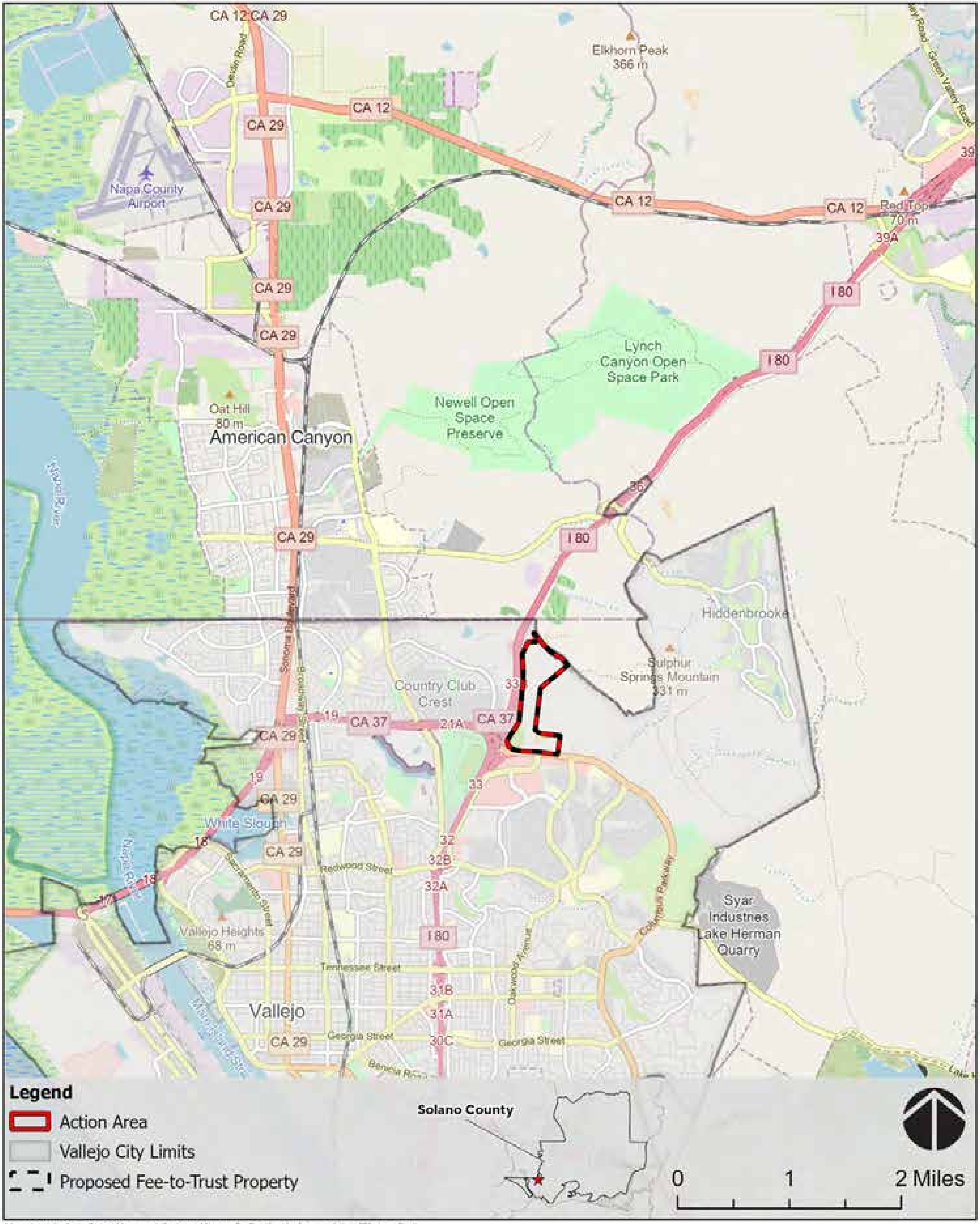
Access to the property would be via the intersection of an existing gravel road with Columbus Parkway. This existing access driveway would be upgraded and new paved roads would be constructed providing access to the proposed fee-to-trust property and development components.



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

FIGURE 1

REGIONAL LOCATION



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

FIGURE 2
SITE AND VICINITY

Esri Community Maps Contributors, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census

FIGURE 3
AERIAL OVERVIEW

Source: Esri, USDA FSA, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User

FIGURE 4
SITE PLAN

As a component of the Proposed Action, the Tribe has committed to the establishment of an approximately 45.1-acre biological preserve within the Action Area that is designed to protect habitat of the greatest quality and value for special-status species. The Tribe intends to memorialize this commitment via a Tribal ordinance and a Memorandum of Understanding (MOU) between the Tribe, BIA, and U.S. Fish and Wildlife Service (USFWS). The biological preserve would be subject to a USFWS-approved management plan for the long-term protection of the habitat within the preserve. The management plan would address invasive species control, wildfire management, and other maintenance activities. The site plan provided in **Figure 4** outlines the footprint of ground disturbance as well as the biological preserve.

The approximate size of the Proposed Action footprint (project footprint) consists of approximately 56.1 acres, inclusive of the totality of grading areas and lands isolated within grading areas. Stockpiling of materials and staging of equipment would be within the project footprint and would not result in additional areas of impacts.

Drainage and Stormwater

A grading and drainage plan has been prepared for the Proposed Action and is included as **Figure 5**. Existing drainage conditions are comprised of a mixture of swales and channels that occur within naturally low-lying areas of the Action Area. These features collect runoff following storm events and do not receive sufficient water to be wetted for significant periods of time. Two primary drainages cross the Action Area and flow from the northeast to the southwest. Both of these features combine into a single channel that flows into a wetland complex, then into a double-pipe culvert south of the Action Area. This culvert directs stormwater under Auto Mall Parkway and into Rindler Creek, which is tributary to Lake Chabot. The northern of the two drainages would remain in its existing location. Where roadways cross this drainage, they would be designed with appropriately-sized culverts to maintain flows of this feature. Grading would occur in these areas to ensure the stability of the road, though changes to the route of the drainage would not occur. The southern drainage overlaps with the location of the proposed gaming facility. This feature would be re-routed via an earthen swale that would discharge into the same receiving water south of the riparian area that currently receives discharge from this feature and eventually discharges into the wetland complex (**Figure 5**). The earthen swale would be designed such that discharge rates would not exceed pre-development conditions. Additionally, sheet runoff from the east of the Action Area currently flows southwest across the Action Area, eventually collecting in the same wetland complex. Sheet flow from the adjacent property to the east would be collected in a proposed concrete-lined swale that would transition into an earthen swale prior to discharge into the wetland complex. Discharge into the wetland from two drainages and the concrete swale would be dissipated prior to discharge such that pre-development discharge rates would not be exceeded.

Stormwater would be collected within one of seven drainage management areas. Each drainage management area has been designed with a bioretention area that would collect pre-treated stormwater and further treat stormwater runoff from impervious surfaces (**Figure 5**). Bioretention sizing was based upon the 4 percent rule, which implements a low impact development (LID) treatment strategy where 4 percent of the area of impervious surfaces within a drainage management area are dedicated to landscaped bioretention.

Construction and Best Management Practices

Construction activities would consist of vegetation removal, grading activities, placement of foundations and erection of buildings, paving of access drives, and installation of utilities with the project footprint.

Legend

PROPERTY LINE
EASEMENT LINE
RETAINING WALL
PROPOSED BUILDING WALL AND OVERHANG
DRAINAGE MANAGEMENT AREA BOUNDARY
SURFACE FLOW DIRECTION
ASPHALT CONCRETE
WETLAND AREA
BIORETENTION AREA

0 500 1,000 Feet

Steelman Partners 2024 and

FIGURE 5

GRADING AND DRAINAGE

Construction is anticipated to occur over a single phase commencing in 2026 and lasting for approximately 18 months. Protective measures and best management practices (BMPs), including regulatory requirements and voluntary measures that would be implemented by the Tribe, have been incorporated into the design of the Proposed Action and include the following:

- Pets shall not be allowed on site during construction.
- Waste receptacles shall be made available within the Project Site and shall be properly maintained, with regular trash removal. All trash and food items should be promptly contained within closed, wildlife-proof containers. These should be regularly removed from the Project Site to reduce the attractiveness of the area to ravens and other predators.
- Construction equipment shall be cleaned prior to use in the Project Site in order to prevent the spread of invasive or noxious species to the Project Site. When applicable, weed-free dirt, mulch, gravel, and other materials should be used.
- Open trenches shall be covered at the end of each workday or shall have ramps installed at regular intervals to prevent the entrapment of wildlife. In addition, the project proponent, its agents, or contractors shall cover or fill all potential pitfalls to wildlife or cavities in which wildlife may become trapped when not attended. These include pits, trenches, vats, buckets, pipes, etc.
- Equipment and materials that could provide refuge for wildlife shall be checked prior to use or movement to ensure wildlife are not present. If present, wildlife shall be allowed to vacate the area unharmed on their own.
- Exterior lighting shall be downcast and shielded such that lighting and glare do not overspill the built environment.
- Uplighting, disruptive flashing lights, or materials that cause excessive glare shall not be used.
- Coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit shall be obtained from the U.S. Environmental Protection Agency (EPA) for construction site runoff during the construction phase in compliance with the Clean Water Act (CWA).
- A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared, implemented, and maintained throughout the construction phase of the development, consistent with General Construction Permit requirements. The SWPPP would include, but would not be limited to, the following BMPs to minimize storm water effects to water quality during construction:
    - Grading activities shall be limited to the immediate area required for construction.
    - Temporary erosion control measures (such as silt fences, fiber rolls, staked straw bales, temporary re-vegetation, rock bag dams, erosion control blankets, and sediment traps) shall be employed as needed for disturbed areas. Plastic monofilament or similar materials that could entangle wildlife shall not be used.
    - Construction activities shall be scheduled to minimize land disturbance during peak runoff periods to the extent feasible.
    - Disturbed areas shall be paved, re-vegetated, and/or stabilized following construction activities.
    - A spill prevention and countermeasure plan shall be developed that identifies proper storage, collection, and disposal measures for potential pollutants used on-site.
    - Petroleum products shall be stored, handled, used, and disposed of properly in accordance with provisions of the CWA (33 USC §§ 1251 to 1387).
    - Construction materials shall be stored, covered, and isolated to prevent runoff loss and contamination of surface and groundwater.
    - Fuel and vehicle maintenance areas shall be limited to the impact area.
    - Sanitary facilities shall be provided for construction workers.

- To minimize dust generation during construction, soil will be wetted down with water prior to ground disturbance as needed.
- Generated waste shall be properly disposed of.

1.3 LISTED SPECIES AND CRITICAL HABITAT

Critical Habitat

A small portion along the northern border of the Action Area is designated as critical habitat for California red-legged frog (**Figure 6**). This feature extends to the north and east of the Action Area. This feature is a spur of critical habitat that straddles the Hiddenbrooke development and development within the City of Vallejo. Only a sliver of this spur overlaps with the Action Area, outside of the project footprint and wholly within the biological preserve area. This spur appears to be centered along American Canyon Creek, indicating that this spur may have been intended to capture American Canyon Creek and an associated buffer. American Canyon Creek is located north and on the opposite side of an elevated ridge from the Action Area. Both the Action Area and American Canyon Creek fall within the American Canyon Creek-Frontal San Pablo Bay Estuaries (180500020401) watershed (USEPA, 2024). However, the majority of critical habitat near the Action Area is within the Sulphur Springs Creek (180500010105) watershed.

USFWS Species List

An official USFWS species list was generated online using the USFWS IPaC Trust Resource Report System (**Attachment A**). The following protected resources were identified:

Plants

- Showy Indian Clover (*Trifolium amoenum*) – Endangered
- Tiburon Paintbrush (*Castilleja affinis ssp. neglecta*) - Endangered

Mammals

- Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*) - Endangered

Birds

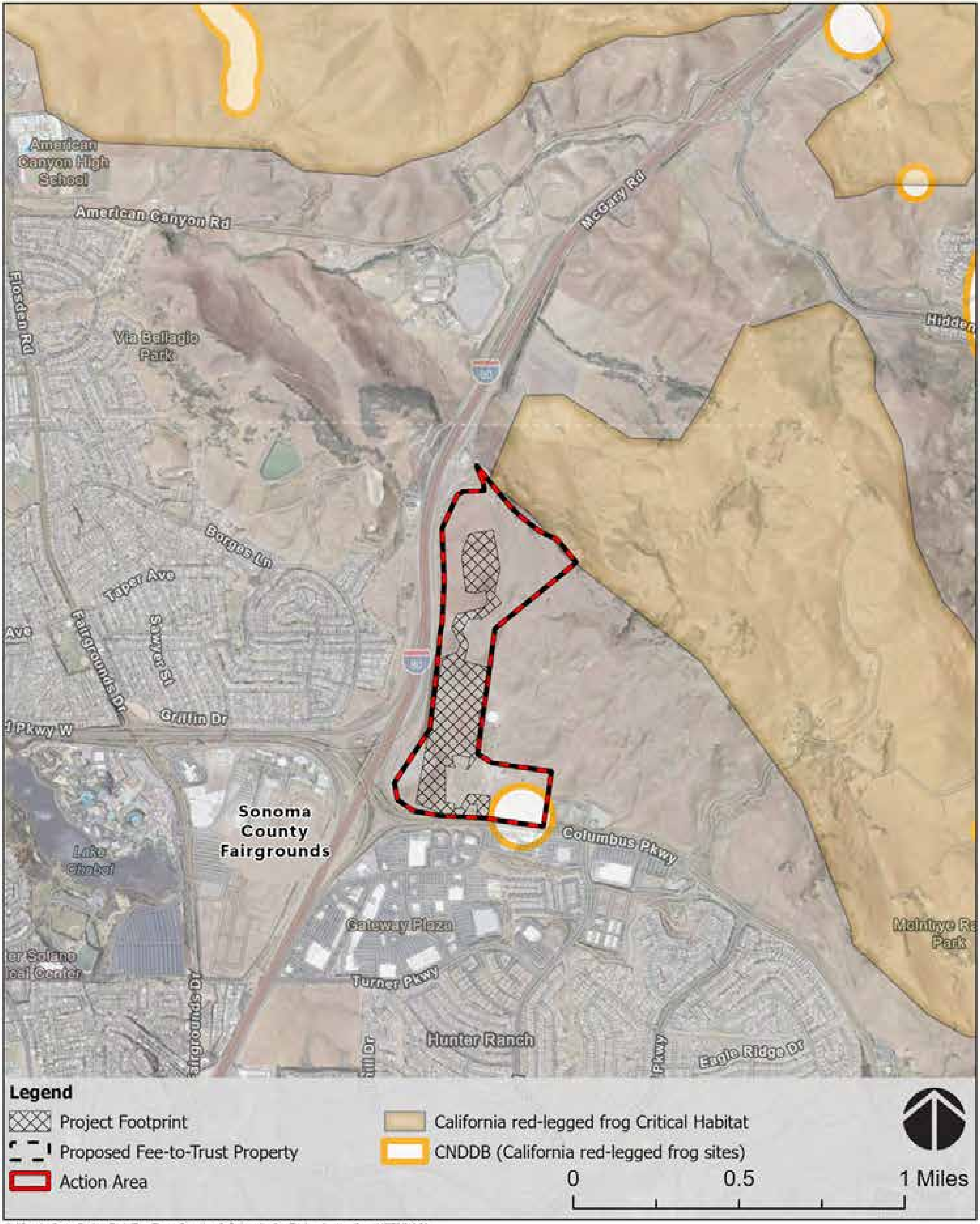
- California Least Tern (*Sternula antillarum browni*) – Endangered
- California Ridgway's Rail (*Rallus obsoletus obsoletus*) – Endangered
- Western Snowy Plover (*Charadrius nivosus nivosus*) – Threatened

Reptiles

- Northwestern Pond Turtle (*Actinemys marmorata*) - Proposed Threatened

Amphibians

- California Red-legged Frog (*Rana draytonii*) – Threatened
- Western Spadefoot (*Spea hammondii*) – Proposed Threatened



California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS, Source: Esri,

FIGURE 6
CALIFORNIA RED-LEGGED FROG HABITAT

Insects

- Callippe Silverspot Butterfly (*Speyeria callippe callippe*) - Endangered
- Monarch Butterfly (*Danaus plexippus*) - Candidate

Crustaceans

- Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) – Threatened

1.4 HISTORICAL OCCURRENCES OF LISTED SPECIES

The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) does not report any listed species or special-status species within the Action Area. The CNDDB does have a historical occurrence of California red-legged frog immediately southeast of the Action Area associated with Rindler Creek, discussed further in **Section 4.5**. The location of this occurrence is shown in **Figure 6**. The CNDDB accuracy buffer of the occurrence overlaps with the Action Area, however, Rindler Creek does not cross the Action Area. Additionally, a prior biological survey of the Action Area identified Callippe silverspot butterfly within the Action Area, discussed further in **Section 4.6**. There are no other known historical occurrences of listed species within a mile of the Action Area.

1.5 HABITAT CONSERVATION PLANS

The Action Area is located within the plan area of the draft Solano Multispecies Habitat Conservation Plan (SMHCP). The City of Vallejo is a plan participant, and the full geographical extent of the City falls within the plan area, which indicates that the Action Area is part of the plan area (SCWA, 2012). The SMHCP is currently in administrative draft form, and a final plan has not yet been adopted. Covered species include California red-legged frog, Callippe silverspot butterfly, northwestern pond turtle, monarch butterfly, and salt marsh harvest mouse.

1.6 CONSULTATION TO DATE

The BIA and USFWS provided technical assistance throughout the project planning and environmental analysis processes and were consulted throughout completion of this BA. A site visit was completed on April 3, 2024 by Acorn Environmental staff accompanied by BIA Regional Wildlife Biologist Peter DeJongh and USFWS Ecological Services Senior Biologist Joseph Terry. The visit was focused on understanding the existing ecological conditions of the site, examining the site's potential to sustain protected species, and discussing strategies to incorporate adequate mitigation measures into the project design to offset project impacts to protected species.

Section 2 | Methods

2.1 PRELIMINARY DATA GATHERING AND RESEARCH

Prior to conducting the field survey, the following information sources were reviewed:

- Previous biological resource studies pertaining to the Action Area: Huffman Broadway Group (2005 and 2006); Jennings (2008); AES (2016); Monk & Associates, Inc. (2022); Montrose Environmental Solutions (2022 and 2023)
- USGS 7.5 degree-minute topographic quadrangles of the Action Area and vicinity
- Aerial photography of the Action Area
- The California Natural Diversity Database (CNDDB)(CDFW, 2024a)
- A query of the California Native Plant Society's database *Inventory of Rare and Endangered Plants of California* (online edition) (CNPS, 2024a)
- USFWS National Wetlands Inventory (NWI) mapper (**Figure 7**)
- USFWS species list (**Attachment A**)

2.2 FIELD SURVEY

Field visits have previously been conducted within the Action Area in October 2005, and on November 8, 2005; May 17 and 23, 2006; July 5, 2006; January 31, 2007; February 10, 2007; March 28, 2007; April 4 and 11, 2007; July 10, 2007; December 17, 2015; November 15, 2019; April 22, May 22, and August 11, 2020; September 7, 2022; and June 27, 2023 (Huffman Broadway Group 2005 and 2006; Jennings 2008; AES 2016; Monk & Associates, Inc., 2022; Montrose Environmental Solutions, 2022 and 2023). Consulting biologist Dr. G.O. Graening performed an updated biological field assessment and aquatic resources delineation of the Action Area on April 3, and May 4, 2024, and collected data on wildlife and plant species present, as well as habitat types and jurisdictional waters. Consulting botanist Tim Nosal, M.S. performed an updated protocol botanical survey of the Action Area on April 7 and June 1, 2024. Variable-intensity pedestrian surveys were performed. Fauna and flora observed were recorded in a field notebook and identified to the lowest possible taxon. Survey efforts emphasized the search for federally-listed species with potential to occur in the vicinity of the Action Area. Habitat types occurring in the Action Area were mapped using hand-held GPS receivers, and information on habitat conditions and the suitability of habitats to support listed species was also recorded.

2.3 MAPPING AND OTHER ANALYSES

Locations of species' occurrences and habitat boundaries within the Action Area were mapped using hand-held GPS receivers, and color aerial photographs were interpreted and then all the data was digitized to produce the habitat maps. The boundaries of potentially jurisdictional water resources within the Action Area were identified and measured in the field and similarly digitized to calculate acreages and to produce aquatic resources delineation maps. Geographic analyses were performed using geographical information system software (ArcGIS Pro, ESRI, Inc.). Vegetation communities (assemblages of plant species growing in an area of similar biological and environmental factors) were classified by Vegetation Series (distinctive associations of plants, described by dominant species and particular environmental setting) using the CNPS Vegetation Classification system (CNPS, 2024b).

Esri Community Maps Contributors, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census

FIGURE 7
NATIONAL WETLAND INVENTORY

Wetlands and other aquatic habitats were classified using USFWS National Wetlands Inventory Classification System for Wetland and Deepwater Habitats, or "Cowardin class" (Cowardin et al., 1979). A formal wetland delineation was conducted and identified features based upon the three requisite wetland parameters (hydrophytic vegetation, hydric soils, hydrologic regime) defined in the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory, 1987). Corresponding data points were selected and data sheets generated. The delineation will be submitted to USACE for verification.

Wildlife habitats were classified according to the CDFW's California Wildlife Habitat Relationships System (CDFW, 2024b). Species' habitat requirements and life histories were identified using the following sources: Baldwin et al. (2012); Calflora (2024a); CDFW (2024b); and University of California at Berkeley (2024).

Section 3 | Results of Surveys

3.1 ENVIRONMENTAL SETTING

The Action Area is located within the Central Coast geographic subregion, which is contained within the Central Western California region of the larger California Floristic Province (Baldwin et al. 2012). The Action Area falls within Climate Zone 17 "Marine effects in Southern Oregon, Northern, and Central California." Climate Zone 17 experiences a mild climate with cool, wet winters and cool summers with frequent fog and wind. Temperatures in this zone do not fall below 20 degrees Fahrenheit with an average high of 97 degrees Fahrenheit (Sunset, 2024).

The topography is a series of undulating hill slopes and valleys on the flank of Sulphur Springs Mountain. Elevations range between 130 feet above mean sea level in the southern portion of the Action Area to approximately 800 feet above mean sea level in the northern portion. The Action Area is largely undeveloped open space used primarily for cattle and horse grazing, except for a corridor of electrical transmission lines. There is also an elevated and graded pad in the southern portion of the Action Area that may have been contemplated as a development site in the past, but no built features are located on it. The existing access driveway also leads to numerous wooden shacks that are currently used as horse shelters. A mixture of wire and t-post fencing and chain link fencing bounds the grazing areas within the Action Area. Surrounding development includes commercial development to the south, rangeland to the north and east, and highways, a large vista rest stop, and residential developments to the west.

3.2 SOIL TYPES

USDA soil survey data maps the following soil units within the Action Area:

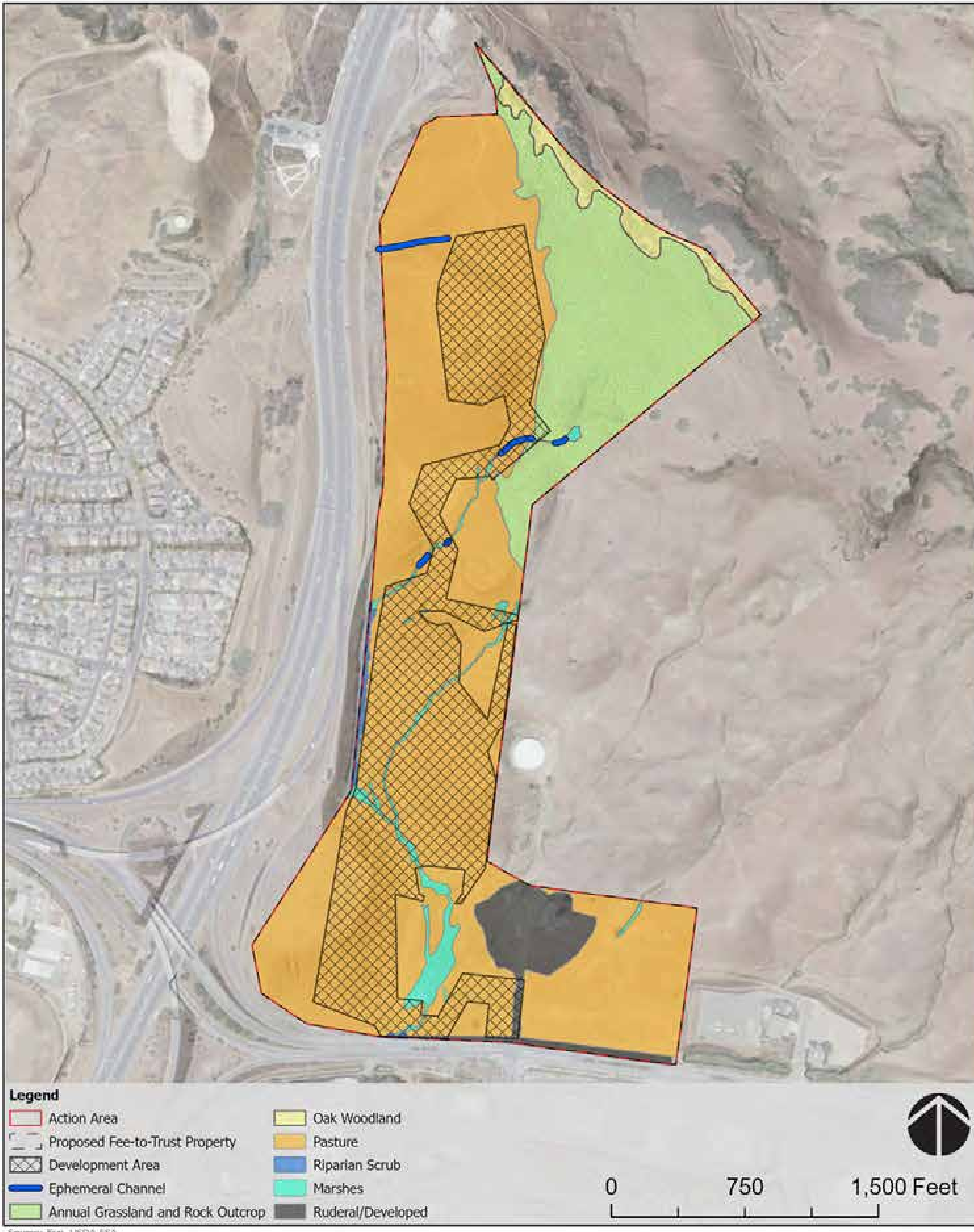
- Dibble-Los Osos clay loam series (30-50% slope, eroded, not hydric)
- Clear Lake clay series (2-5% slope, hydric)
- Toomes stony loam series (30-75% slope, eroded, not hydric)

Additionally, metamorphic rock outcrops are present in the northern portions of the Action Area.

3.3 HABITAT TYPES

Habitat types that occur within the Action Area consist of riparian scrub, freshwater marsh, oak woodland, pasture, ruderal/developed, and annual grassland/rock outcrop. These habitats are shown on **Figure 8** and discussed further below. Representative site photographs are provided in **Attachment B**, and a list of plant species observed during the 2024 site visits and prior site visits within the Action Area is included as **Attachment C**. **Table 1** below summarizes the acreages of these habitat types as they occur within the Action Area, the project footprint, and the biological preserve area.

In addition to the habitat types discussed below, ephemeral channels were observed in areas of steep topography and/or connecting marsh habitat. These are linear features that lack wetland habitat and are dry except during or immediately following a rain event, but are represented in **Table 1** below to illustrate the complete level of impact to existing drainage features.



Source: Esri, USDA FSA, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User

FIGURE 8
HABITAT TYPES

Table 1: Habitat Types within the Action Area

Habitat Type	Total Acreage within Project Site	Acreage within Biological Preserve*	Acreage within Project Footprint
Riparian scrub	0.4	0.0	0.0
Freshwater marsh	3.4	0.3	1.1
Pasture	114.3	10.7	51.8
Oak woodland	3.7	3.7	0.0
Ruderal/developed	7.4	0.0	0.4
Annual grassland/ rock outcrop	30.8	30.5	0.3
Channels	767 linear feet (lf)	65 lf	307 lf
Totals	**160.0**	**45.1**	**53.6**

* Note: There are a total of approximately 45.1 acres within the Biological Preserve. The individual habitat types appear to total slightly higher due to rounding.

Ruderal/Developed (7.4 acres)

Ruderal/developed habitats are those areas that are highly modified from their natural state and are subject to intensive land management, paving, or similar. Within the Action Area, ruderal developed areas included an unpaved access drive and informal parking areas, fencing, and horse shelters. Vegetation was sparse to absent in this area. Where vegetation did occur, it was dominated primarily by non-native grasses and weedy forbs. Of the 7.4 acres of ruderal/developed habitat within the Action Area, 0.4 acres fall within the project footprint.

Riparian Scrub (0.4 acres)

This community is found on the western edge of the Action Area; it is associated with an off-site, intermittent drainage that is fed by both the flank of Sulphur Springs Mountain as well as road runoff from I-80. The vegetation is dominated by arroyo willow (*Salix lasiolepis*) with an understory of Himalayan blackberry (*Rubus discolor*) and poison oak (*Toxicodendron diversilobum*), and limited areas of broad-leaved cattail (*Typha latifolia*). Vegetation along the edge of the riparian habitat included sweet fennel (*Foeniculum vulgare*) and coyote brush (*Baccharis pilularis*). The riparian habitat transitions to either marsh or pasture, depending upon the local topography. This habitat is wholly outside of the project footprint.

Freshwater Marsh (3.4 acres)

Freshwater marsh habitat was observed in the valleys of hills. The dominant plants in these areas are rushes (e.g. *Juncus bufonius*) and spikerushes (*Eleocharis*). Facultative grasses and forbs are also present, such as perennial ryegrass (*Lolium perenne*), Bermuda grass (*Cynodon dactylon*), curly dock (*Rumex crispus*), common monkeyflower (*Mimulus guttattus*), and pennyroyal (*Mentha* sp.). Ponded areas contain floating plants such as watercress (*Nasturtium officinale*). The water quality of these marshes has been impacted by cattle, which are allowed to wallow and graze in the wetlands.

Approximately 1.1 acres of freshwater marsh falls within the project footprint. These impacts would be related to re-alignment of existing drainages and grading associated with implementing road crossings. A total of 0.3 acres of freshwater marsh falls within the biological preserve area and 2.0 acres elsewhere within the Action Area. An existing drainage totaling approximately 1,520 linear feet of channels and marshes would be rerouted. Following construction, the re-routed length of this feature would be 920 linear feet of earthen swales. It is anticipated that a series of marshes would line the re-routed drainage similar to the existing drainage.

Pasture (114.3 acres)

The majority of the Action Area is a simplified non-native grassland containing perennial ryegrass (*Lolium perenne*), wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), and other pasture grasses. These areas are subject to significant grazing pressure and may have been plowed or conditioned previously. Non-native forbs are abundant, such as thistles (*Silybum*, *Carduus*), filarees (*Erodium*), star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echioides*), poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), and spiny cocklebur (*Xanthium spinosum*). Large patches of artichoke thistle (*Cynara cardunculus*) were also observed within this habitat. Approximately 51.8 acres of pasture falls within the project footprint, with an additional 10.7 acres within the biological preserve area. The remainder of pasture habitat elsewhere within the Action Area.

Annual Grassland/Rock Outcrop (30.8 acres)

This non-native annual grassland community is similar to the pasture community described above, but contains a greater diversity of species and greater number of native species. This is due in part to the rocky terrain, which is more difficult for cattle to graze, and because the metamorphic soils and rock outcrops provide additional habitat niches. Native wildflowers were abundant, such as California poppy (*Eschscholzia californica*), golden violet (*Viola pedunculata*), owl's clover (*Castilleja*), and blue dicks (*Dichelostemma capitatum*). Seeps were common at the base of rock outcrops, and these wet areas created microhabitats for specialized plants, such as ferns and succulents (*Dudleya* spp.). The project footprint intersects with 0.3 acres of this habitat. The remaining 30.5 acres falls within the biological preserve area.

Oak Woodland (3.7 acres)

A narrow strip of oak woodland occurs along the northern boundary of the Action Area along a hilltop crest. This habitat contains a significant canopy cover of coast live oak (*Quercus agrifolia*). Ground cover vegetation is similar to species observed within the annual grassland/rock outcrop habitat. The totality of this habitat type is outside of the project footprint and within the biological preserve area.

3.4 WILDLIFE USE

Wildlife species observed within the Action Area are included in **Attachment C** and are compiled from the current 2024 surveys and previous surveys (Huffman Broadway Group 2005 and 2006; Jennings 2008; AES 2016; Monk & Associates, Inc., 2022; Montrose Environmental Solutions, 2022 and 2023).

3.5 WATER RESOURCES

National Wetland Inventory

NWI reports several linear aquatic features within the Action Area, as shown on **Figure 7**. All NWI features within the Action Area are described as "Riverine" habitat. These features were confirmed to exist during the aquatic resources delineation; they consist of riverine wetlands that are associated with drainage channels and swales.

Wetlands

Freshwater marshes (emergent wetlands) are present throughout the middle of the Action Area in the drainages between hills and in other low-lying areas; these areas total approximately 3.4 acres and are dominated by rushes and sedges, as described in **Section 3.3** under the freshwater marsh header.

Channels

Where gradients are steeper, channels form and have exposed bedrock. There are 767 linear feet of channels, and these channels link with marshes to form extensive drainage systems through the grassland and pasture habitats.

Gullies have formed in a graded area in the southern portion of the Action Area. These are isolated erosional features that terminate in upland fields and are not connected directly to the channel-mash drainages. In lower gradient areas, there are various grass-lined swales that transmit water briefly after storms. These features do not form channels but help to drain the grasslands and pastures.

Section 4 | Species Accounts

4.1 PLANTS

Showy Indian Clover (*Trifolium amoenum*)

Endangered

Showy Indian clover is an annual flowering plant in the pea family that produces large, purple, white-tipped flowers from April to June (USFWS, 2024a; Calflora, 2024b). Showy Indian clover was first described by Edward L. Greene from specimens collected in 1890 near Vanden, Solano County, California. The range of the species was originally from Mendocino County south to Sonoma, Marin, Alameda, and Santa Clara counties, and east to Napa and Solano counties. The species previously occurred in a variety of habitats including low, wet swales, grasslands, and grassy hillsides up to 1,020 feet in elevation. It was considered extinct until 1993 when a single plant was discovered in Occidental, Sonoma County that is now extirpated. In 1996, the Dillon Beach population was discovered in Marin County, which was the only known population at the time of listing. The USFWS and its partners had since established a population at Point Reyes National Seashore as well as another at the Bodega Marine Reserve in Sonoma County that was extirpated by 2012. Only the Dillon Beach and Point Reyes National Seashore populations, both possessing the "prostrate" phenotype, are known to remain in the wild (USFWS, 2024a).

Suitable habitat for Showy Indian clover is present in the Action Area in the hilly northern half of the Action Area that contains marshes and annual grassland/rock outcrop habitats. Botanical surveys conducted on June 27, 2023, and April 7, and June 1, 2024 did not detect this species. This is within the bloom window for this species, and five other clovers were in bloom in the Action Area: hop clover (*Trifolium dubium*), rose clover (*T. hirtum*), thimble clover (*T. microdon*), subterranean clover (*T. subterraneum*), and white tipped clover (*T. variegatum*).

Tiburon Paintbrush (*Castilleja affinis ssp. neglecta*)

Endangered

Tiburon paintbrush is a semi-woody flowering plant in the snapdragon family that can grow up to two feet tall. It flowers along an upright stalk with the densest blooms at the top, which gives it the characteristic paintbrush appearance. Tiburon paintbrush flowers are usually yellow, but can be found in yellowish-pink and sometimes red (USFWS, 2024b). The Tiburon paintbrush is a hemiparasite that requires the presence of other nearby flowering plants to uptake nutrients from the roots of other plants (CDFW, 2024c). This species occurs on serpentine soils in bunchgrass habitat. Associated species include California gilia (*Gilia achilleifolia subsp. multicaulisin*), California poppy, dwarf plantain (*Plantago erecta*), purple needlegrass (*Stipa pulchra*), Tiburon buckwheat (*Eriogonum luteolum var. caninum*), and serpentine reedgrass (*Calamagrostis ophitidus*) (CDFW, 2024c). This species is native to California and is currently found in seven sites across Marin, Santa Clara, and Napa counties. Its historical range is thought to be comparable to its current range (USFWS, 2024b). The nearest reported occurrence in the CNDDB is 2.5 miles north of the Action Area on a site with serpentine soils.

Although within the general range of the species, the Action Area does not contain the requisite serpentine soil habitat for Tiburon paintbrush. Botanical surveys conducted on June 27, 2023, and April 7, and June 1, 2024 did not detect this species. The April 2024 botanical survey was timed correctly, as two other species in the genus were in bloom: purple owl's clover (*Castilleja exserta*) and Indian paintbrush (*Castilleja attenuata*).

4.2 MAMMALS

Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*)

Endangered

The salt marsh harvest mouse is a specialized rodent adapted to live within saline or subsaline marsh habitats in and around the San Fransisco Bay Estuary and the Suisun Bay area (USFWS, 2024b). Within tidal and diked marshes, this species requires a high cover of pickleweed. Additionally, this species requires sufficient escape habitat and vegetative cover during high tide periods (USFWS, 2024b). Threats to the ongoing survival of this species include loss and fragmentation of habitat from development, as well as potential climate change risks and associated sea level rise.

There is no suitable habitat for salt marsh harvest mouse within the Action Area, as there is no hydrologic connection with an ocean bay, slough, or other brackish waters. As suitable habitat is absent, there is no potential for this species to occur.

4.3 BIRDS

California Least Tern (*Sternula antillarum browni*)

Endangered

California least terns are colonial nesters that nest between mid-April to mid-September in groups of 15 to 300 pairs (USFWS, 2024c). There are 23 known nesting sites along beaches, river mouths, estuaries, and coastal embayments. Foraging activities take place within nearshore waters, such as river mouths and estuaries, and target slender-bodied fish such as anchovies and topsmelt (USFWS, 2024c). When inland, these birds stay close to the shore. Primary threats to this species include coastal development as well as high levels of human disturbance along recreational beaches.

There is no suitable habitat for California least tern within the Action Area. As suitable habitat is absent, there is no potential for this species to occur.

California Ridgway's Rail (*Rallus obsoletus obsoletus*)

Endangered

California Ridgway's rail inhabits saltwater marshes, freshwater marshes near saltwater marshes, and mangrove swamps in California, Arizona, Nevada, and coastal western Mexico. Populations are declining largely due to wetland loss and degradation (NatureServe, 2024a). In the Delta, Ridgway's rail forages in mudflats in tidal sloughs. Nesting occurs in marshlands near tidal ponds. Foraging occurs within mud or sand and their diet consists of mussels, clams, small crabs, and spiders (NatureServe, 2024a).

There is no suitable habitat or prey base for California Ridgeway's rail within the Action Area. As suitable habitat is absent, there is no potential for this species to occur.

Western Snowy Plover (*Charadrius nivosus nivosus*)

Threatened

The western snowy plover is an inhabitant of sandy beaches with sparse vegetation, as well as nearby dry salt flats of lagoons, dredge spoils, levees and flats on salt-evaporation ponds, river bars, and alkaline/saline lakes (USFWS, 2024d). This bird feeds on aquatic invertebrates. Nesting occurs on nearshore habitat utilizing pebbles, shell fragments, or similar. Main threats to this species include recreational use of suitable beach habitat creating unsuitable levels of disturbance, as well as habitat degradation (USFWS, 2024d).

There is no suitable habitat for western snowy plover within the Action Area. As suitable habitat is absent, there is no potential for this species to occur.

4.4 REPTILES

Northwestern Pond Turtle (*Actinemys marmorata*)

Proposed Threatened

The species is known to occur in a wide variety of aquatic habitats including rivers and streams, lakes, ponds, reservoirs, permanent and ephemeral shallow wetlands, stock ponds, and sewage treatment lagoons (Holland, 1994). Optimal habitat seems to be characterized by the presence of adequate emergent basking sites, emergent vegetation, and the presence of suitable refugia in the form of undercut banks, submerged vegetation, mud, rocks, and logs. The CNDDB reports the nearest records to be in the Sky Valley area in Sulphur Springs Creek approximately 2 miles east of the Action Area, and another record in the sloughs of American Canyon 3 miles northwest of the Action Area. In-stream dispersal distances have been recorded of over 0.12 miles. Long distance overland dispersal between waterbodies has been recorded at up to approximately 1.0 miles in California and 3.1 miles in Oregon (NatureServe, 2024b). It is assumed that suitable upland habitat within 500 meters of suitable aquatic habitat may be used for nesting or aestivation.

The Action Area contains suitable upland dispersal habitat for northwestern pond turtle in the marsh and channel system that runs through the center of the Action Area. Additionally, terrestrial habitat across the totality of the Action Area is considered by USFWS to be suitable overland dispersal habitat given the distance from CNDDB occurrences within aquatic habitat and the overland dispersal capabilities of this species. The potential for the Action Area to serve as dispersal habitat is limited by the presence of dispersal barriers in the form of major highways along the western and southern boundary of the Action Area.

Since there are no ponds or other permanent water sources within the Action Area, there is no breeding habitat in the Action Area. Suitable breeding aquatic habitat is not present within 500 meters of the Action Area; therefore, suitable nesting/aestivation habitat is not present in the Action Area. The nearest ponds or other permanent waters are: 800 meters to the east of the Action Area in a marsh in upper Rindler Creek; 1,400 meters to southwest in lower Rindler Creek; 900 meters to the north in American Canyon Creek; 2,500 meters to southeast in Blue Rock Springs Golf Course; 1,150 meters to the southwest in Lake Chabot; a drinking water reservoir 700 meters to the west.

4.5 AMPHIBIANS

California Red-legged Frog (*Rana draytonii*)

Threatened

The historical range of the CRLF extended from the vicinity of Point Reyes National Seashore in Marin County southward to northwestern Baja California, Mexico and inland to approximately Redding, CA in Shasta County (61 Federal Register 25813), with the current range including Sonoma and Mendocino Counties (USFWS, 2023a). CRLF has sustained a 70 percent reduction in its geographic range (USFWS, 2024e). CRLF has been observed in a number of aquatic and terrestrial habitats, including marshes, streams, lakes, reservoirs, ponds and other permanent, or near permanent, sources of water. Although they occur in ephemeral streams or ponds, CRLF are expected to thrive in permanent deep-water pools with dense stands of overhanging willows (*Salix* spp.) and emergent vegetation. However, they have been observed in a variety of aquatic environments, including stock ponds and artificial pools with little to no vegetation. CRLF are usually observed near water but can move long distances over land between water sources during the rainy season (USFWS, 2024e). Aestivation habitat for this species includes moist habitat that provides this species refuge during the dry season (61 Federal Register 25814; California Herps, 2024; CCC, 2017). Threats to this species include habitat loss/alteration and competition and predation by non-native species (USFWS, 2024e).

Critical habitat has been designated for CRLF, and the Action Area contains a very small portion of this critical habitat on the northern property boundary (**Figure 6**). According to the CNDDB, a CRLF population was documented in Rindler Creek in 1997 and 1998, approximately 500 feet to the east of the Action Area. The CNDDB occurrence note is "Rindler Creek vicinity, on the north side of Columbus Parkway, 0.4 mile east of I-80, Vallejo." The CNDDB accuracy buffer of the occurrence overlaps with the Action Area; however, Rindler Creek does not cross the Action Area but is instead routed underground into a municipal storm sewer system. Several adults and up to 38 juveniles were sighted. In 1998, one adult and one juvenile were relocated to a stock pond on PG&E's Swett Ranch. There does not appear to be any recent data on the status of the population in Rindler Creek. The other nearest occurrences reported in the CNDDB are a population in the Sky Valley area in Sulphur Springs Creek, 2 miles east of the Action Area, and another population in American Canyon/American Canyon Creek, 2.5 miles north of the Action Area. **Figure 6** displays the Action Area in relation to designated critical habitat and historical CRLF observations.

Herpetologist Mark Jennings performed protocol surveys for CRLF in the Action Area on January 31, February 10, March 28, April 4 and 11, and July 1 and 10, 2007. No CRLF were detected, but Pacific chorus frogs and rough-skinned newt were detected (Jennings, 2008). Jennings (2008) concluded that the Action Area did not contain suitable breeding habitat for CRLF because there was a lack of deep pools of water in the Action Area, because of the presence of predators such as raccoons and wading birds, and because of the significant distance between the Action Area and known CRLF populations.

The aquatic resources delineation performed by Acorn Environmental biologists confirmed that the Action Area contains no ponds, perennial channels, or other permanent water resources. Therefore, the Action Area does not contain breeding habitat for CRLF. However, the Action Area does contain marshes and terrestrial habitat that could be used by CRLF as dispersal habitat, and the marshes remain sufficiently moist to provide suitable aestivation habitat.

Western Spadefoot (*Spea hammondii*)

Proposed Threatened

Western spadefoot breeds within temporary pools between January to June and requires pooled water for breeding activity and for the tadpole life stage (CDFW, 2000; ADW, 2024). Vegetation within pooled areas is necessary for egg attachment. Adults spend the majority of the dry season underground and therefore require friable soils for burrowing. Generally, where one western spadefoot toad burrow occurs, more are present. Suitable burrowing habitat could occur within grasslands, chaparral, scrub, and oak woodlands where tree canopy coverage is not too high (CDFW, 2000; ADW, 2024). Burrows are often located away from breeding areas, with juveniles dispersing in the late spring into summer. Adults are active at night when they engage in foraging for insects and other invertebrates.

The Action Area contains no ponds, perennial channels, or other permanent water resources. There is one marsh in the center of the Action Area that was previously documented as containing chorus frog tadpoles. Western spadefoot can breed in seasonal wetlands that remain wet for 30 days. The observance of chorus frog tadpoles suggests that at least occasionally this feature holds water long enough to support breeding western spadefoot. The draft SMHCP discussed **in Section 1.5** has been developed in consultation with the USFWS and includes those species with the potential to occur within the plan area, including the Action Area. Western spadefoot was not included within the draft SMHCP, and therefore was determined to be outside of the plan area, including the Action Area. Additionally, the nearest known occurrence of this species is recorded in CNDDB over 30 miles from the Action Area. Based upon this, the Action Area is outside of the extant range of this species.

4.6 INSECTS

Callippe Silverspot Butterfly (*Speyeria callippe callippe*)

Endangered

Callippe silverspot butterfly occurs within California grasslands. California golden violet (*Viola pedunculata*) is the sole larval host plant for this species (USFWS, 2024f). Although the larval stage feeds exclusively on California golden violet, a variety of other plant species can provide nectar sources for adult foraging. The butterfly stage lasts up to 14 days and generally occurs from mid-May through July. Adults congregate on hilltops to select a suitable mate before laying up to 600 eggs on their host plant (USFWS, 2024f). Larvae hatch approximately one week later, retreat to the ground level, and enter diapause. Diapause lasts from early summer of their hatching until the following spring when adult flights occur. Threats to this species include habitat loss, degradation, and fragmentation as well as wildfire and use of pesticides (USFWS, 2024f).

According to botanical surveys performed in 2023 and 2024, the northern third of the Action Area contains the breeding host plant (California golden violet), and this area corresponds generally to the soils derived from metamorphic rock (USDA mapped soil type "*ToG2: Toomes stony loam, 30 to 75 percent slopes, eroded*"; NRCS, 2024). **Figure 9** shows the locations of this host plant observed during the April and June 2024 surveys as well as the differentiation of the Action Area into "host plant habitat" and "nectar resource habitat." Non-suitable habitat includes those areas that are ruderal/developed and contain sparse to no vegetation. The nectar resource habitat is the portion of the Action Area that does not contain host plants, but does contain other flowers that can be used by Callippe silverspot adults as nectar resources. A wildlife survey conducted on June 27, 2023 detected Callippe silverspot butterflies within the

Action Area (Montrose Environmental Solutions, 2023). The field notes state: "*A small population of yellow pansies was observed within the hilltop area/hillcrest present a few feet outside the boundary of the Subject Property and included a cohort of positively identified Callippe silverspot butterflies numbering approximately ten individuals*." **Figure 9** shows the location of the observed Callippe silverspot butterflies. **Table 2** below summarizes the suitable habitat for this species and the proportion that falls within the biological preserve and the project footprint.

Table 2: Callippe Silverspot Habitat Types in Action Area

Callippe Silverspot Habitat Type	Total Acreage within Project Site	Acreage within Biological Preserve	Acreage within Project Footprint
Host Plant and Nectar Habitat	42.2	39.1	2.9
Nectar Habitat	111.4	6.0	50.3
Non-Suitable Habitat	7.4	-	0.4
Total	**160.0**	**45.1**	**53.6**

Monarch Butterfly (*Danaus Plexippus*)

Candidate

The monarch butterfly is a candidate species and not yet formally proposed for listing. During the breeding season, monarchs lay their eggs on their obligatory milkweed host plant (primarily plants in the genus *Asclepias*, but also *Cynanchum*, *Funastrum*, *Gonolobus*, and *Matelea*), and larvae emerge after two to five days (USFWS 2024g). Larvae develop through five molts over a period of 9 to 18 days, feeding on milkweed and sequestering toxic chemicals as a defense against predators. The larva then pupates into a chrysalis before emerging 6 to 14 days later as an adult butterfly. There are multiple generations of monarchs produced during the breeding season, with most adult butterflies living approximately two to five weeks; overwintering adults enter into reproductive diapause (suspended reproduction) and live six to nine months (USFWS, 2024g).

Monarchs in temperate climates, such as western North America, undergo long-distance migration, and live for an extended period of time. In the fall, monarchs begin migrating to their overwintering sites. This migration can take monarchs distances of over 3,000 km and last for over two months. In early spring (February-March), surviving monarchs break diapause and mate at the overwintering sites before dispersing. The same individuals that undertook the initial southward migration begin flying back through the breeding grounds and their offspring start the cycle of generational migration over again (USFWS, 2024g).

The botanical surveys performed in 2023 and 2024 did not detect any milkweeds or other host plants for monarch butterfly; therefore, potential habitat is limited to nectar foraging habitat. Within the Action Area, suitable foraging habitat for Monarch butterfly occurs primarily in the northern third of the Action Area in the area mapped as containing the USDA soil type "*ToG2: Toomes stony loam.*" This area is shown on **Figure 9** as the host plant habitat for Callippe silverspot butterfly, but also represents the higher quality Monarch butterfly foraging habitat as it contains a greater abundance of flower species and densities than does the rest of the Action Area. The balance of the Action Area, with the exception of ruderal/developed habitat, still contains some level of flowering plants that can serve as nectar resources, but at a lower density due to grazing pressure, increased human activity, and soil regimes.

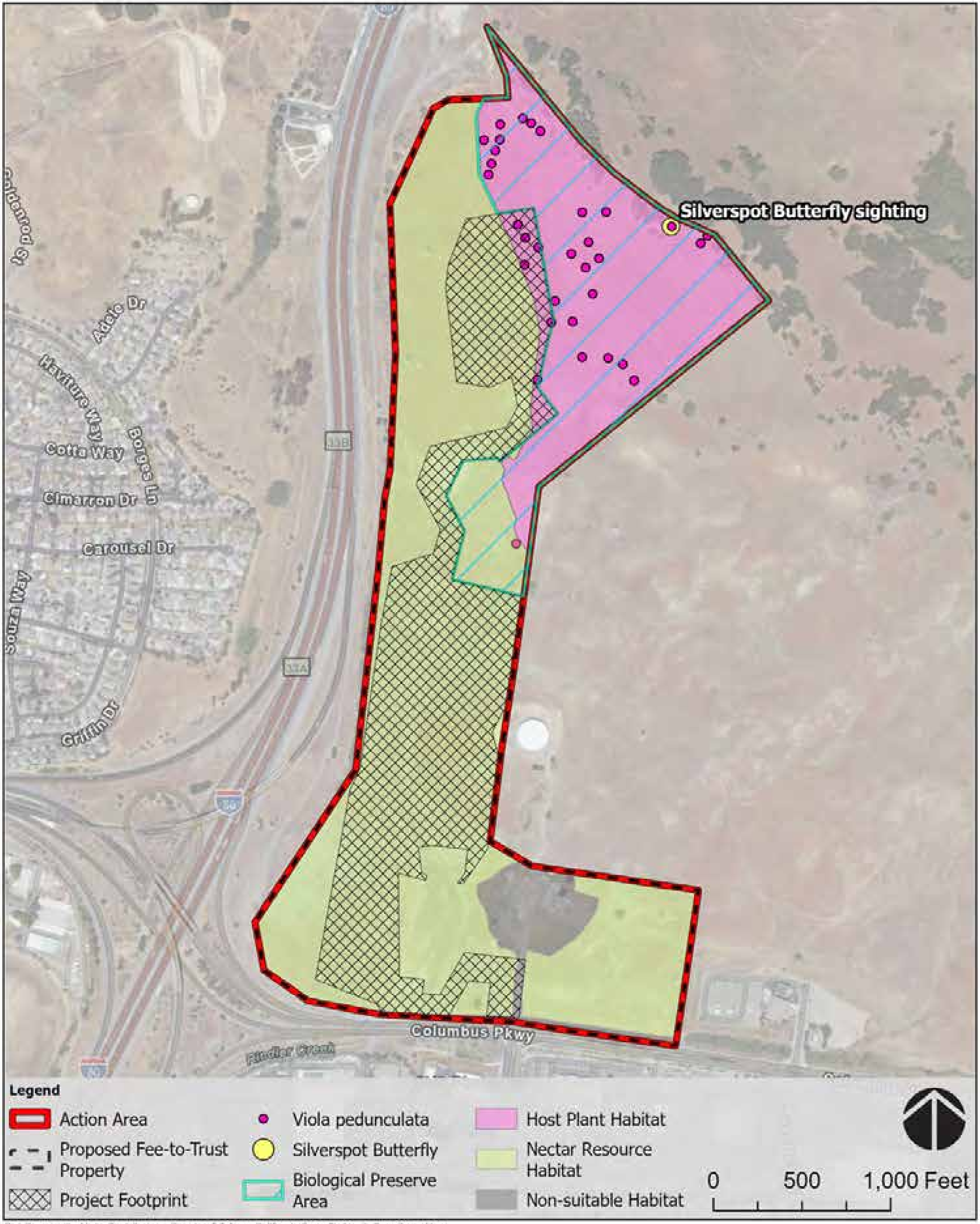


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FIGURE 9
CALLIPPE SILVERSPOT BUTTERFLY HABITAT

4.7 CRUSTACEANS

Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)

Threatened

The vernal pool fairy shrimp is a small, freshwater crustacean that is found in vernal pools in California. They have slender bodies, large, stalked compound eyes and 11 pairs of swimming legs that also function as gills. They glide gracefully through the water upside down, swimming by beating their legs in a complex, wavelike movement that passes from front to back. Unlike other types of shrimp, the vernal pool fairy shrimp does not have a hard outer shell. Vernal pool fairy shrimp are restricted to vernal pools found in California and southern Oregon. They are currently found in 32 counties across California's Central Valley, central coast, and southern California, and in Jackson County in southern Oregon (USFWS, 2024h).

The Action Area does not contain vernal pools; seasonal wetlands are emergent marshes that are choked with rushes and sedges, and do not contain persistent pools of water suitable for vernal pool crustaceans. There is no potential for vernal pool fairy shrimp to occur in the Action Area.

Section 5 | Effects Determination

Based on guidance provided by the ESA Section 7 Effects Determination Guidance, possible effects determinations for the Proposed Action are:

- **No effect:** The proposed action will not affect the listed species or critical habitat.
- **May affect but is not likely to adversely affect:** The proposed action will affect a listed species in a way that is discountable, insignificant, or completely beneficial. Discountable effects are extremely unlikely to occur; insignificant effects are impacts small enough that they never reach the scale where a take occurs, and completely beneficial effects are positive effects without any adverse effects to the species.
- **May affect and is likely to adversely affect:** The proposed action will either directly or indirectly, or through its interrelated and interdependent actions, adversely affect a listed species.

These guidelines were used in determining conclusions of this BA and are discussed for the critical habitat and listed species below.

5.1 POTENTIAL ADVERSE EFFECTS ON CRITICAL HABITAT

Designated critical habitat occurs within the northern edge of the Action Area for CRLF as shown in **Figure 6**. The Proposed Action does not involve any habitat conversion or ground disturbance in, or near, this critical habitat. The biological preserve area identified in **Figure 4** captures and preserves the totality of the CRLF critical habitat that overlaps with the Action Area. Implementation of the Proposed Action will have <u>no effect on designated critical habitat for any federally listed species</u>.

5.2 POTENTIAL ADVERSE EFFECTS ON LISTED SPECIES

The following is a discussion of potential adverse impacts by species that could occur as a result of the Proposed Action. Each species identified in the USFWS species list included as **Attachment A** is discussed herein.

Showy Indian Clover

Suitable habitat for showy Indian clover is present in the Action Area in the hilly northern half of the Action Area that contains marshes and annual grassland/rock outcrop habitats. Botanical surveys conducted on June 27, 2023 and April 7 and June 1, 2024 did not detect this species. The Action Area is not located within any of the known populations of showy Indian clover, which is restricted to those locations. The biological preserve would capture the majority of the suitable habitat for this species within the Action Area. As this species is absent from the Action Area and suitable habitat would be preserved, the Proposed Action would have <u>no effect on showy Indian clover</u>.

Tiburon Paintbrush

As discussed in **Section 4.1**, this species occurs on serpentine soils in bunchgrass habitat, and the Action Area does not contain the requisite habitat. Botanical surveys conducted on June 27, 2023 and April 7, and June 1, 2024 did not detect this species, although more common species of *Castilleja* were present and identifiable. Because of the lack of suitable habitat and the negative results of focused botanical surveys for the species, it is concluded that Tiburon paintbrush has no potential to occur in the Action Area. Therefore, the Proposed Action would have no effect on Tiburon paintbrush.

Salt Marsh Harvest Mouse

As discussed in **Section 4.2**, there is no suitable habitat for salt marsh harvest mouse in the Action Area, and this species does not have potential to occur. Therefore, the Proposed Action would have no effect on salt marsh harvest mouse.

California Least Tern

As discussed in **Section 4.3**, there is no suitable habitat for California least tern in the Action Area, and this species does not have potential to occur. Therefore, the Proposed Action would have no effect on California least tern.

California Ridgway's Rail

As discussed in **Section 4.3**, there is no suitable habitat for California Ridgway's rail in the Action Area, and this species does not have potential to occur. Therefore, the Proposed Action would have no effect on California Ridgway's rail.

Western Snowy Plover

As discussed in **Section 4.3**, there is no suitable habitat for western snowy plover in the Action Area, and this species does not have potential to occur. Therefore, the Proposed Action would have no effect on western snowy plover.

Northwestern Pond Turtle

Northwestern pond turtle is not known to occur in the Action Area, general wildlife surveys did not detect it, and implementation of the Proposed Action is therefore not expected to result in direct take (mortality) of a known population. As discussed in **Section 4.4**, northwestern pond turtle will travel up to 500 meters from suitable breeding habitat for nesting and aestivation. **Figure 10** presents suitable breeding habitat for northwestern pond turtle in relation to the Action Area. As shown on **Figure 10**, no suitable breeding habitat occurs within 500 meters of the Action Area. Since there are no perennial ponds or channels or other permanent water sources in the Action Area or within 500 meters of the Action Area, there is no aestivation or nesting habitat in the Action Area.

Northwestern pond turtles are known to disperse up to 4.3 miles within waterbodies and up to 3 miles across terrestrial upland habitat (Federal Register, 2023). The nearest records of northwestern pond turtle in relation to the Action Area are in Sulphur Springs Creek approximately 2 miles east, and in the sloughs of American Canyon 3 miles northwest. Therefore, according to USFWS, both aquatic and terrestrial habitat within the Action Area could be used as dispersal habitat. Although northwestern pond turtle is only likely to utilize the marsh and channel system that runs through the center of the Action Area, this report conservatively assesses for loss of terrestrial and aquatic dispersal habitat within the Action Area. It is further noted that dispersal habitat within the Action Area is of lower quality and is less likely to be utilized due to the adjacent major freeways bounding the Action Area to the west and south, and the ongoing human disturbance associated with cattle and horse grazing.

FIGURE 10

SUITABLE AQUATIC BREEDING HABITAT FOR NORTHWESTERN POND TURTLE

The grading area of the Proposed Action is 53.6 acres; therefore, the Proposed Action would result in the loss of 53.6 acres of low-quality dispersal habitat. Approximately 106.4 acres, or 66.5 percent of the Action Area would remain undeveloped and could still be utilized by dispersing northwestern pond turtle. Additionally, impacts to the marsh habitat suitable for dispersal would primarily be related to re-routing of an existing drainage. The drainage that would be re-routed is currently approximately 1,520 linear feet. The re-routed drainage would total approximately 920 linear feet and is expected to largely replace the marsh habitat. Finally, as part of project design, seven bioretention ponds would be installed throughout the Action Area in order to collect treated stormwater runoff. Therefore, the Proposed Action would result in a loss of a portion of the dispersal habitat within the Action Area, but would remain useable as dispersal habitat following construction and would provide dispersal habitat of greater value to northwestern pond turtle through the replacement of terrestrial habitat with pond habitat.

It is also possible that northwestern pond turtle could migrate into the Action Area between the time of the last wildlife surveys and the beginning of construction. To ensure that northwestern pond turtles are not directly impacted by project activities, the following avoidance measures are identified in **Section 6**: pre-construction surveys, the erection of wildlife exclusion fencing, worker environmental awareness training, and periodic biological monitoring. These measures would ensure that there will be no take of northwestern pond turtle during the construction phase. In order to prevent mortality during the operational phase from vehicular traffic, the borders of the paved area shall be designed with a raised curb to prevent northwestern pond turtle from accessing vehicle areas, and bridges or culverts shall be designed over wetlands to allow ongoing access of the undeveloped areas of the Action Area to dispersing northwestern pond turtle.

With the implementation of avoidance, minimization, and mitigation measures specified in **Section 6** and consideration of project design and BMPs, the Proposed Action <u>may affect but is not likely to adversely affect</u> northwestern pond turtle.

Although an adverse impact would not occur, it is noted that the compensatory mitigation proposed for CRLF discussed below involves the preservation of lands in the Action Area or off-site, which will similarly benefit northwestern pond turtle by the preservation of suitable habitat. The Tribe has already committed to preserving a portion of the Action Area (**Figure 4**) that contains 0.3 acres of non-breeding aquatic habitat and 44.8 acres of adjacent dispersal lands.

California Red-legged Frog

Designated critical habitat occurs within the northern edge of the Action Area for California red-legged frog, within the biological preserve area. The Proposed Action does not involve any habitat conversion or ground disturbance in, or near, this critical habitat as discussed in **Section 5.1**. California red-legged frog is not known to occur in the Action Area; therefore implementation of the Proposed Action is not expected to result in direct take (mortality) of a known population.

The Action Area does not contain aquatic breeding habitat for CRLF. However, the Action Area does contain marshes that could be used by CRLF as aquatic dispersal habitat or aestivation habitat. According to USFWS guidance, all lands within 3 miles of a known CRLF population should be considered suitable dispersal habitat for CRLF because such dispersal distances have been documented. As discussed in **Section 4.5**, there are three historic observations of three separate CRLF populations within three miles of the Action Area. Therefore, the entire Action Area could be utilized by CRLF for dispersal, and marsh habitat could be used for aestivation. Therefore, implementation of the Proposed Action would impact approximately 1.1 acres of aestivation habitat and 52.5 acres of upland dispersal habitat. Additionally, take of CRLF could occur should construction activities commence within marsh habitat during the dry season (generally following the last spring rains and concluding following the inception of fall rains). Therefore, preconstruction surveys and exclusion identified in **Section 6** would be timed during the active season for CRLF to ensure take would not occur.

The likelihood that CRLF would disperse across the Action Area is higher than northwestern pond turtle given the closer proximity of suitable breeding habitat and the historical occurrence of this species within a portion of Rindler Creek near the Action Area. As discussed above for northwestern pond turtle, dispersal habitat is of lower quality due to adjacent development, major roadways, and ongoing disturbance. The majority of the Action Area (66.5 percent) would remain undeveloped. As discussed above, culverts and/or bridges would be installed to ensure continue access through the Action Area for dispersal. Therefore, the Action Area would continue to remain suitable to serve as dispersal habitat for CRLF.

Loss of suitable aestivation habitat would be considered an adverse effect to CRLF. However, impacts to the marsh habitat would be related to re-routing of one of the on-site drainage features and culverting or bridging over aquatic habitat at roadway crossings. An earthen, vegetated swale would be placed to re-route the existing drainage into a naturally occurring low lying area that would drain into the same feature as the existing drainage. The drainage that would be re-routed is currently approximately 1,520 linear feet. The re-routed drainage would total approximately 920 linear feet and is expected to largely replace the lost aestivation habitat. The re-routed drainage would be designed to mimic the existing drainage and would be expected to hold the same volume of water across a similar area as the existing drainage. Therefore, permanent loss of aestivation habitat would largely be offset. However, in order to provide a conservative analysis, this report assumes a loss of 1.1 acres of aestivation habitat and that such a loss would constitute an adverse effect on CRLF. **Section 6** outlines recommended mitigation to offset loss of this habitat at a 3:1 ratio. The biological preserve area captures 0.3 acres of suitable aestivation habitat, leaving a mitigation deficit of 3.0 acres. **Section 6** recommends that the remaining 3.0 acres be offset by one or a combination of the following:

- Placement of some or all of the remaining 2.0 acres of unimpacted marsh habitat within the Action Area into the biological preserve area;
- Purchase of mitigation credits in a conservation bank that contains suitable habitat;
- Purchase of off-site preserve lands that contain suitable habitat; and/or
- Creation of new aquatic habitat in the Action Area and siting or placement of such lands within the biological preserve area.

Section 6 outlines the habitat preservation and compensatory mitigation actions to ensure that adequate habitat is preserved and properly managed for the benefit of CRLF to offset habitat loss resulting from implementation of the Proposed Action.

It is possible that CRLF could migrate into, or colonize, the Action Area between the time of the last wildlife surveys and the beginning of construction. To ensure that CRLFs are not directly impacted by project activities, the following avoidance measures are identified in **Section 6**: pre-construction surveys, the erection of wildlife exclusion fencing, worker environmental awareness training, and periodic biological monitoring. These measures would ensure that there will be no take of CRLF during the construction phase.

As stated above, the Proposed Project may affect and is likely to adversely affect CRLF via habitat loss. Avoidance, minimization, and mitigation measures are recommended in **Section 6** to address this effect.

Western Spadefoot

As discussed in **Section 4.5**, the Action Area is outside of the extant range of this species and general wildlife surveys did not detect it. Therefore, the Proposed Action would have no effect on western spadefoot.

Callippe Silverspot Butterfly

Callippe silverspot was detected in wildlife surveys in 2023, therefore implementation of the Proposed Action could result in direct take (mortality) of individuals of a known population. The Action Area contains both host breeding plants and nectar resource plants; **Figure 9** identifies the locations of "host plant habitat" and "nectar resource habitat" based upon the presence or absence of the breeding plant *Viola pedunculata*. The project footprint would result in impacts to approximately 2.9 acres of the host plant habitat and 50.3 acres of nectar resource habitat. Thus, project implementation may affect and is likely to adversely affect Callippe silverspot.

Compensatory mitigation is proposed in **Section 6** to reduce the adverse effect. Host plant habitat is of the greatest value, and **Section 6** therefore recommends a mitigation ratio of 3:1 in-kind for impacts to host plant habitat. The loss of nectar resources would still be considered an adverse impact to this species, though this habitat is not as valuable as host plant habitat. Therefore, **Section 6** recommends a mitigation ratio of 2:1 in-kind or 1:1 for higher quality host plant for the loss of nectar resource habitat. Therefore, the Proposed Action would require an offset of 8.7 acres of host plant habitat and 100.6 acres of nectar resource habitat.

The biological preserve area would preserve and manage 45.1 acres of Callippe silverspot habitat, 37.2 acres of which are host plant habitat. Therefore, 8.7 acres of host plant habitat would meet the recommended 3:1 ratio. The remaining 36.4 acres would be counted towards lost nectar resource habitat. Therefore, there would be a mitigation deficit of 64.2 acres of nectar resource habitat. **Section 6** recommends that the remaining 64.2 acres be offset by some combination of the following:

- Placement of some or all of the remaining 56.8 acres of unimpacted nectar resource habitat within the Action Area into the biological preserve area;
- Purchase of off-site preserve lands that contain suitable habitat; and/or
- Purchase of mitigation credits in a conservation bank that contains suitable habitat.

Section 6 outlines the habitat preservation and compensatory mitigation actions to ensure that adequate habitat is preserved and properly managed for the benefit of Callippe silverspot to offset habitat loss resulting from implementation of the Proposed Action.

Monarch Butterfly

Wildlife surveys performed in 2023 and 2024 did not detect monarch butterflies. The botanical surveys performed in 2023 and 2024 did not detect milkweeds or other host plants for monarch butterfly. No roost habitat is present within the Action Area and no trees need to be removed for project construction. Implementation of the Proposed Action is therefore not expected to result in direct take (mortality) of a known population. Potential impacts would be limited to loss of suitable foraging habitat.

Project implementation would impact 53.2 acres of land that contains some nectar resources for monarch butterflies. The Proposed Action would avoid 102.1 acres (52.1 percent) of suitable nectar resource habitat. Specifically, the area shown as suitable host plant habitat for Callippe silverspot represents the area of highest quality nectar resource habitat for Monarch butterfly as this area has a higher density and variety of flowering plants. The Proposed Action would therefore avoid 39.1 acres (92.7 percent) of the higher quality foraging habitat for Monarch butterfly. Therefore, although this species has not been observed within the Action Area, the Proposed Action would maintain the majority of foraging habitat and over 90 percent of the higher quality foraging habitat.

According to USFWS (2023), the Action Area does not contain overwintering habitat (i.e., specific tree groves on the California coastline), but it is in an overwintering zone of the coast (i.e., within five miles of the coast from Mendocino County south through Santa Barbara County). In this zone, USFWS (2023) has specific land management recommendations that the Tribe will adopt as avoidance and minimization measures (see **Section 6**). These land management recommendations will reduce adverse effects on butterflies through the elimination of pesticide use and incompatible landscaping. With the implementation of land management and BMP guidance from USFWS, the Proposed Project may affect but is not likely to adversely affect Monarch butterfly.

Although an adverse effect would not occur, according to the USFWS, compensatory mitigation provided for Callippe silverspot butterfly would also benefit monarch butterfly. The two species can co-exist, and they would both benefit from the preservation of lands containing nectar resources.

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp are restricted to vernal pools. The Action Area does not contain vernal pools; there is no potential for vernal pool fairy shrimp to occur in the Action Area. Therefore, the Proposed Action would have no effect on vernal pool fairy shrimp.

5.3 INDIRECT EFFECTS AND CUMULATIVE EFFECTS

For the purposes of this assessment, indirect effects consist of the potential off-site degradation of natural habitats, such as the increase in noise or lighting or by the discharge of pollutants to receiving waterbodies. The existing noise environment has significant sources of noise, primarily vehicular traffic from the adjacent high-volume roadways, I-80 and Auto Mall Parkway. There is also noise from the commercial center to the south and the strong winds generated by the maritime climate and mountainous topography. Noise from the Proposed Action will add an increment of noise to the environment (from the operation of air conditioners, fans, generators, etc.), but is not likely to significantly increase the existing noisy environment. Likewise, light pollution exists in the surrounding environment from commercial activities and from vehicles. The proposed commercial and residential buildings will employ light shielding, low-intensity efficient bulbs, and other light pollution mitigation measures. The Proposed Action will not generate significant new levels of light pollution. Additionally, the Tribe has committed to project BMPs outlined in **Section 1.2**, including use of downcast and shielded light.

The Proposed Action may also result in connections to municipal utilities. Should municipal connections be required, these actions would be limited to connections to existing infrastructure, or placement of infrastructure within the existing adjacent roadways/road shoulders. These areas are already paved/graveled, or otherwise disturbed and would not provide habitat for federally-listed species.

During construction of the proposed facilities and roads, surface water quality has the potential to be degraded from storm water transport of sediment from disturbed soils or by accidental release of hazardous materials or petroleum products from sources such as heavy equipment servicing or refueling. This is a potentially adverse effect for projects that disturb at least 1 acre of ground. On tribal trust land, the Tribe must enroll in the USEPA's 2022 Construction General Permit. On non-federal land, the landowner must enroll under the State Water Quality Control Board's Construction General Permit prior to the initiation of construction. In conjunction with enrollment under either of these permit programs, a Storm Water Pollution Prevention Plan, Erosion Control Plan, and a Hazardous Materials Management/Spill Response Plan must be created and implemented during construction to avoid or minimize the potential for erosion, sedimentation, or accidental release of hazardous materials. Implementation of these measures mandated by law would reduce potential construction-related impacts to water quality. BMPs that would be included within the SWPPP are outlined in **Section 1.2**.

During operation of the proposed facilities and parking lots, surface water quality has the potential to be degraded from stormwater transport of pollutants to receiving waterbodies. This could result in indirect impacts to habitat quality, particularly aquatic habitats. As discussed in **Section 1.2**, the Tribe has included BMPs as a component of project design to ensure that the hydrology of the site is not modified by changes to impervious surfaces and the landform, and that stormwater is treated before discharge.

Other development projects in the City of Vallejo consist of infill development and are separated from the Action Area by heavy development and major roadways (City of Vallejo, 2024). These actions are separated by biological barriers to those species potentially impacted by the Proposed Action and would not cumulatively contribute to potential impacts from the Proposed Action. As these projects are largely infill, they occur in areas of poor quality habitat that are either developed or ruderal in nature.

Section 6 | Avoidance, Minimization, and Mitigation Measures

Measure 1: Preconstruction Surveys and Exclusionary Fencing

To ensure that CRLF and northwestern pond turtle are not present in construction areas, pre-construction clearance surveys shall be conducted by a qualified biologist. A qualified biologist is defined as a person who has the educational background, training, and work experience (handling experience and/or permits) required to perform a specific biological task and have been approved by the USFWS. If any of these species are discovered during the survey, project construction activities shall not begin until the species have voluntarily vacated the construction area or USFWS has been consulted and avoidance and minimization measures established and then implemented.

As CRLF is not detectable during aestivation, the pre-construction survey shall occur during the wet season, after fall rains have commenced and before the conclusion of spring rains. Once the pre-construction surveys confirm that CRLF and northwestern pond turtle are not present, the construction crew shall immediately install animal exclusion fencing to separate construction areas from the marshes and channels outside of the impact area. The fencing shall be constructed out of plastic weed cloth or construction fabric, shall be keyed into the ground, and shall be supported by stakes and wire mesh, as needed. Fencing shall also be opaque, a minimum three feet in height, and installed with a smooth material such that it cannot be climbed. A qualified biologist shall oversee the installation of the exclusionary fencing to ensure its suitability. A qualified biologist shall also make regular inspections during the preconstruction period and during the construction periods when grading and other ground disturbance activities are occurring to ensure the integrity of the fence.

Measure 2: Worker Environmental Awareness Training

All construction personnel shall receive worker environmental awareness training before they enter the construction site. The training program shall include, at a minimum, descriptions of the focal species (Callippe silverspot and monarch butterflies, CRLF, and northwestern pond turtle), and how to identify and avoid these focal species. Personnel shall be trained to halt work in the event that one of these focal species is observed within the work area and allow the individual to leave the work site on its own. Personnel shall be instructed to limit work activities to the designated construction areas and to properly store equipment and materials in the designated laydown area. A qualified biologist shall make regular inspections during the construction periods when grading and other ground disturbance activities are occurring to ensure best management practices are being adequately followed.

Measure 3: Dispersal Access for Northwestern Pond Turtle and California Red-Legged Frog

The Proposed Action shall be designed such that culverts, free-span bridges, or similar shall be installed where roadways cross drainages. Road crossings shall be designed such that CRLF and northwestern pond turtle can freely pass underneath the road crossings. Additionally, a permanent barrier such as a curb shall be installed around the perimeter of paved areas, with the exception of points of access, to discourage

CRLF and northwestern pond turtle from entering the build environment. Designs of the barrier shall be submitted to USFWS for coordination and approval.

Measure 4: Compensatory Mitigation for California Red-legged Frog

Implementation of the Proposed Action would impact approximately 1.1 acres of CRLF aestivation habitat. The biological preserve shown in **Figure 4** contains 0.3 acres of suitable CRLF aestivation habitat, which would offset impacts to 0.1 acres of habitat at a 3:1 ratio. This area shall be protected via Tribal ordinance and a Memorandum of Understanding with USFWS and the BIA. Funds shall be set aside for management of the preserve, and a management plan shall be adopted by the Tribe in consultation with, and approved by, the USFWS and BIA.

Mitigation for the balance of the impacted aestivation habitat (1 acre) shall be achieved through the options listed below, including the preservation of existing habitat at a 3:1 ratio (requiring 3 acres of preservation), purchase of habitat credits at a 3:1 ratio (requiring purchase of 3 acres of credits), or creation of aquatic habitat of equal or greater quality at a 2:1 ratio (requiring the creation of 2 acres of habitat):

- <u>Placement of additional lands into the biological preserve</u>: A total of 2.0 acres of suitable CRLF aestivation habitat is available within unimpacted lands within the Action Area. A portion or the totality of these areas could be added to the biological preserve area. Mitigation achieved through the addition of lands into the biological preserve would be at a 3:1 ratio. Under this option, the Tribe would protect the additional preserve lands via Tribal ordinance and a Memorandum of Understanding with USFWS and the BIA. A management plan shall be adopted by the Tribe in consultation with, and approval by, the USFWS and BIA.
- <u>Purchase of off-site preserve lands that contain suitable habitat</u>: These lands would be deed-restricted by a conservation easement or other enforceable protection instrument. These lands would ideally be transferred to a third party such as a land conservancy. Funds shall be set aside for management of the preserve. A management plan shall be adopted by the Tribe in consultation with, and approval by, the USFWS and BIA. Mitigation achieved through this method would be at a 3:1 ratio.
- <u>Purchase of mitigation credits in a conservation bank</u>: This would occur through a bank that contains suitable habitat for the target species, such as: North Bay Highlands Conservation Bank, Ohlone West Conservation Bank; Oursan Ridge Conservation Bank; or Ridge Top Ranch Wildlife Conservation Bank. Mitigation achieved through this method would be at a 3:1 ratio.
- <u>Creation of new aquatic habitat</u>: As a component of the Proposed Action, seven bioretention ponds will be established to collect treated stormwater runoff. Additional areas of terrestrial habitat are also available and could be utilized to make additional pond habitat. The bioretention ponds or another artificial reservoir shall be created in uplands, noting aquatic permits are necessary for impounding water in a jurisdictional channel. The created habitat shall have a bottom drain or similar so that the created habitat can be de-watered for predator elimination in the event that bullfrogs colonize the new habitat. If the bioretention areas are utilized for CRLF, they shall be designed such that the water quality is not degraded and compromises amphibian population viability. A management plan shall be prepared for created habitat to ensure long-term funding and suitability of habitat. The management plan shall be approved by the USFWS. Mitigation achieved through this method would be at a 2:1 ratio.

Measure 5: Compensatory Mitigation for Callippe Silverspot Butterfly

Implementation of the Proposed Action would impact approximately 2.9 acres of the host plant habitat and 50.3 acres of nectar resource habitat. The proposed biological preserve shown in **Figure 4** contains 39.1 acres of host plant habitat, 8.7 acres of which would offset impacts to the 2.9 acres of impacted host plant habitat at a 3:1 ratio. The remaining 30.4 acres of high quality host plant habitat in the preserve would offset impacts to 30.4 acres of lower quality nectar habitat at a 1:1 ratio, and the 6 acres nectar habitat within the preserve would offset impacts to 3 acres of nectar habitat at a 2:1 ratio.

Habitat	Impacts (acres)	Recommended mitigation ratio	Acres covered by biological preserve	Remaining impact acres to offset
High-quality host plant and foraging	2.9	3:1 in-kind	8.7 in-kind	0.0
Lower quality foraging only	50.3	1:1 through high-quality host plant and foraging, or 2:1 in-kind	30.4 high-quality host plant and foraging 6.0 acres in-kind	16.9

Mitigation for the balance of the impacted habitat (16.9 acres) shall be achieved through the options listed below:

- <u>Placement of additional lands into the biological preserve</u>: A total of 56.8 acres of suitable Callippe silverspot nectar resource habitat is available within unimpacted lands within the Action Area. A portion or the totality of these areas could be added to the biological preserve area. Mitigation achieved through the addition of lands into the biological preserve would be at a 2:1 ratio. Under this option, the Tribe would protect the additional preserve lands via Tribal ordinance and a Memorandum of Understanding with USFWS and the BIA. A management plan shall be adopted by the Tribe in consultation with, and approval by, the USFWS and BIA.
- <u>Purchase of off-site preserve lands that contain suitable habitat</u>: These lands would be deed-restricted by a conservation easement or other enforceable protection instrument. These lands would ideally be transferred to a third party such as a land conservancy. Funds shall be set aside for management of the preserve. A management plan shall be adopted by the Tribe in consultation with, and approval by, the USFWS and BIA. Mitigation achieved through this method would be at a 2:1 ratio.
- <u>Purchase of mitigation credits in a conservation bank</u>: This would occur through a bank that contains suitable habitat for the target species, such as: Ohlone West Conservation Bank or Ridge Top Ranch Wildlife Conservation Bank. Mitigation achieved through this method would be at a 2:1 ratio.

Measure 6: Land Management Recommendations for Butterfly Protection

To protect Callippe silverspot butterfly and monarch butterfly, the following land management recommendations should be implemented:

- Use of insecticides shall be prohibited; use of herbicides will follow USFWS-approved BMPs
- Utilize only native species in landscaping, erosion control, and habitat restoration
- Time vegetation management activities (such as trimming, mowing, and brush-clearing) to periods when the Callippe silverspot host plants are not blooming and when the butterfly is not

active (generally August 15 – January 31 near callippe host plant habitat).

- In the appropriate identification window prior to impacts, a qualified biologist shall survey the Action Area for California golden violet. A qualified biologist is defined as a person who has the educational background, training, and work experience (handling experience and/or permits) required to perform a specific biological task and have been approved by the USFWS. The qualified biologist shall demarcate a 25 foot buffer around host plants. To the maximum extent feasible, the 25-foot buffer shall be maintained around all host plants outside of the project footprint.

The Action Area does not contain monarch overwintering habitat, but it is in the overwintering zone of the coast. In this zone, USFWS (2023) recommends implementation of the Coastal California Overwintering Habitat / Western Monarch Butterfly Conservation Recommendations (see **Attachment D**). A brief summary of the applicable recommendations is as follows:

- Use only native, locally sourced, insecticide-free plants for habitat restoration and enhancement actions. If plants are grown via contract, use grow specifications that limit pesticide residues.
- Protect monarchs, other pollinators, and their habitats from pesticides, including insecticides, fungicides and herbicides. Avoid applying herbicides to blooming flowers when monarch butterflies are likely around (October 1 – February 28) and when Callippe silverspot butterflies are in flight (May 1-August 15).
- To assist in maintaining normal migration behavior, do not plant any type of milkweed.
- Maximize use of non-chemical weed and pest prevention.
- Select a mosaic plant palate of native species that bloom throughout the year.

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Section 8 | Qualifications of Preparers

G.O. Graening, Ph.D., M.S.E.

G.O. Graening holds a Doctorate in Biological Sciences and a Master of Science in Biological Engineering and is a certified arborist (International Society of Arboriculture). Dr. Graening has 30 years of experience in biological assessment and research. Dr. Graening also served as an adjunct professor of biology at California State University Sacramento for 10 years and was an active researcher in the area of conservation biology and groundwater ecology.

Kelli Raymond, B.S.

Ms. Raymond holds a B.S. in Animal Biology with a focus on Wildlife Ecology. She has approximately 10 years of experience collecting field data and preparing environmental assessments. Ms. Raymond has worked in several states across the U.S. performing biological resources surveys, including plant surveys, bat acoustic and flyout monitoring, and wildlife utilization monitoring. She also has experience live handling numerous wildlife species, including fish, migratory birds, and big game. Ms. Raymond is experienced in the preparation of Biological Assessments and Section 7 consultation with both the USFWS and NMFS under the federal Endangered Species Act.

Attachment A

USFWS Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: 04/02/2024 15:21:21 UTC
Project Code: 2024-0071372
Project Name: Scotts Valley FTT

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

PROJECT SUMMARY

Project Code: 2024-0071372
Project Name: Scotts Valley FTT
Project Type: Acquisition of Lands
Project Description: FTT and economic development
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.1462182,-122.21407914662836,14z

Counties: Solano County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

BIRDS

NAME	STATUS
California Least Tern *Sternula antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
California Ridgway"s Rail *Rallus obsoletus obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

REPTILES

NAME	STATUS
Northwestern Pond Turtle *Actinemys marmorata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

AMPHIBIANS

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
Western Spadefoot *Spea hammondii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

INSECTS

NAME	STATUS
Callippe Silverspot Butterfly *Speyeria callippe callippe* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/3779	Endangered

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRUSTACEANS

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

FLOWERING PLANTS

NAME	STATUS
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
Tiburon Paintbrush *Castilleja affinis ssp. neglecta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2687	Endangered

CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
California Red-legged Frog *Rana draytonii* https://ecos.fws.gov/ecp/species/2891#crithab	Final

IPAC USER CONTACT INFORMATION

Agency: Scotts Valley Band of Pomo Indians of California
Name: Kelli Raymond
Address: 5170 Golden Foothill Parkway
City: El Dorado Hills
State: CA
Zip: 95762
Email kraymond@acorn-env.com
Phone: 9162358224

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Bureau of Indian Affairs

Attachment B

Site Photographs

View looking south of southeastern corner of Action Area and entrance gate.

View looking north along western boundary of Action Area with willow scrub and emergent marsh

View looking west of a graded commercial pad with an erosion gully in a pasture setting

View looking southeast in the middle edge of the Action Area at degraded marsh and horses grazing on neighboring property

View looking northwest in the middle of the Action Area of marsh and electrical transmission lines, with the roadbed of Interstate 80 in the background and a channel and riparian habitat at the base.

Closeup view of the riparian vegetation (primarily arroyo willow)

View looking north of the primary drainage system, which is a series of intermittent channels and wetland pools

View looking south from the northern portion of the Action Area showing the metamorphic rock outcrop and steep slopes

View looking southwest from the northern portion of the Action Area showing the metamorphic rock outcrop and steep slopes and annual grassland

View looking south of pasture and rolling hills and drainage systems in the valleys, with I-80 on the right.

View looking north at the area proposed for tribal housing.

Attachment C

Species Observed

Plants and Animals Observed During the Acorn Environmental Field Surveys on April 3 and 7, May 4, and June 1, 2024, and Prior Field Surveys by Others

Common Name	Scientific Name
PLANTS	
Yarrow	*Achillea millefolium*
Mountain dandelion	*Agoseris sp.*
Bentgrass	*Agrostis sp.*
Silver hairgrass	*Aira caryophyllea*
Crinkled onion	*Allium crispum*
Greater ammi	*Ammi majus*
Common fiddleneck	*Amsinckia intermedia*
Rigid fiddleneck	*Amsinckia retrorsa*
Dog fennel	*Anthemis cotula*
Narrowleaf milkweed	*Asclepias fascicularis*
Hastate orache	*Atriplex prostrata*
Slender wild oat	*Avena barbata*
Coyote brush	*Baccharis pilularis*
Mediterranean lineseed	*Bellardia trixago*
False brome	*Brachypodium distachyon*
Black mustard	*Brassica nigra*
Quaking grass	*Briza minor*
Elegant brodiaea	*Brodiaea elegans*
Weedy brome	*Bromus caroli-henrici*
Ripgut brome	*Bromus diandrus*
Soft chess	*Bromus hordeaceus*
Madrid brome	*Bromus madritensis*
Red brome	*Bromus rubens*
Red maids	*Calandrinia ciliata*
Yellow mariposa lily	*Calochortus luteus*
Superb mariposa lily	*Calochortus superbus*
Western morning glory	*Calystegia occidentalis*
Shepherd’s purse	*Capsella bursa-pastoris*
Italian thistle	*Carduus pycnocephalus*
Slender flowered thistle	*Carduus tenuiflorus*
Valley tassels	*Castilleja attenuata*
Purple owl’s clover	*Castilleja exserta*
Purple star thistle	*Centaurea calcitrapa*
Maltese star thistle	*Centaurea melitensis*
Yellow star thistle	*Centaurea solstitialis*
Meadow chickweed	*Cerastium arvense subsp. strictum*
Sticky mouse-eared chickweed	*Cerastium glomeratum*
Wavy leaf soap plant	*Chlorogalum pomeridianum*
Bull thistle	*Cirsium vulgare*
Clarkia	*Clarkia sp.*
Miner’s lettuce	*Claytonia perfoliata*

Poison hemlock	*Conium maculatum*
Field bindweed	*Convolvulus arvensis*
Brass-buttons	*Cotula coronopifolia*
Pygmy weed	*Crassula tillaea*
Artichoke thistle	*Cynara cardunculus*
Cardoon	*Cynaria cardunculus*
Bermuda grass	*Cynodon dactylon*
Rattlesnake weed	*Daucus pusillus*
Bush monkeyflower	*Diplacus aurantiacus*
Stinkwort	*Dittrichia graveolens*
Canyon dudleya	*Dudleya cymosa*
Mexican tea	*Dysphania ambrosioides*
Creeping spikerush	*Eleocharis macrostachya*
Tall willowherb	*Epilobium brachycarpum*
Naked buckwheat	*Eriogonum nudum*
Broad leaved filaree	*Erodium botrys*
Red-stemmed filaree	*Erodium cicutarium*
White stem filaree	*Erodium moschatum*
Coyote thistle	*Eryngium sp.*
Yellow monkeyflower	*Erythranthe guttata*
California fawn lily	*Erythronium californicum*
California poppy	*Eschscholzia californica*
Blue gum	*Eucalyptus globulus*
Petty spurge	*Euphorbia peplus*
Pacific fescue	*Festuca microstachys*
Rattail sixweeks grass	*Festuca myuros*
Italian ryegrass	*Festuca perennis*
Fennel	*Foeniculum vulgare*
California coffeeberry	*Frangula californica*
Bedstraw	*Galium aparine*
Wall bedstraw	*Galium parisiense*
Nit grass	*Gastridium phleoides*
Cutleaf geranium	*Geranium dissectum*
Bird’s eye gilia	*Gilia tricolor*
Waxy mannagrass	*Glyceria declinata*
Salt heliotrope	*Heliotropium curassavicum*
Bristly oxtongue	*Helminthotheca echioides*
Hayfield tarplant	*Hemizonia congesta*
Few flowered evax	*Hesperevax sparsifolia var sparsiflora*
California western flax	*Hesperolinon californicum*
Shortpod mustard	*Hirschfeldia incana*
Meadow barley	*Hordeum brachyantherum*
Mediterranean barley	*Hordeum marinum ssp. gussoneanum*
Hare barley	*Hordeum murinum subsp. leporinum*
Wall barley	*Hordeum murinum*
Smooth cat’s-ear	*Hypochaeris glabra*

Rough cat's-ear	*Hypochaeris radiata*
Hyssop loosestrife	*Lythrum hyssopifolia*
Black walnut	*Juglans nigra*
Baltic rush	*Juncus balticus*
Toad rush	*Juncus bufonius*
Iris-leaved rush	*Juncus xiphioides*
Willow lettuce	*Lactuca saligna*
Prickly lettuce	*Lactuca serriola*
Bitter lettuce	*Lactuca virosa*
California goldfields	*Lasthenia californica*
Hawkbit	*Leontodon saxatilis*
Field pepperweed	*Lepidium campestre*
Perennial pepperweed	*Lepidium latifolium*
Shining peppergrass	*Lepidium nitidum*
Jepson's leptosiphon	*Leptosiphon jepsonii*
California cottonrose	*Logfia filaginoides*
Lomatium	*Lomatium sp.*
Bird's-foot trefoil	*Lotus corniculatus*
Western lupine	*Lupinus formosus*
Scarlet pimpernel	*Lysimachia arvensis*
Hyssop loosestrife	*Lythrum hyssopifolia*
Alkali mallow	*Malvella leprosa*
California man-root	*Marah fabacea*
German chamomile	*Matricaria chamomilla*
California burclover	*Medicago polymorpha*
California melic grass	*Melica californica*
Silverpuffs	*Microseris sp.*
Seep monkeyflower	*Mimulus guttatus*
Watercress	*Nasturtium officinale*
Olive	*Olea europaea*
Bermuda buttercup	*Oxalis pes-caprae*
Goldback fern	*Pentagramma triangularis*
Kellogg's Yampah	*Perideridia kelloggii*
Common phacelia	*Phacelia distans*
Imbricate phacelia	*Phacelia imbricata*
Phacelia	*Phacelia sp.*
Dwarf plantain	*Plantago erecta*
English plantain	*Plantago lanceolata*
Annual bluegrass	*Poa annua*
One-sided bluegrass	*Poa secunda*
Bluegrass	*Poa sp.*
Licorice fern	*Polypodium arenastrum*
Rabbit's-foot grass	*Polypogon monspeliensis*
Cherry plum	*Prunus cerasifera*
Cudweed	*Pseudognaphalium sp.*
Fairy mist	*Pterostegia drymarioides*

Pear	*Pyrus sp.*
Coast live oak	*Quercus agrifolia*
California buttercup	*Ranunculus californicus*
White water buttercup	*Ranunculus lobbii*
Prickleseed buttercup	*Ranunculus muricatus*
Western buttercup	*Ranunculus occidentalis*
Black locust	*Robinia pseudoacacia*
Himalayan blackberry	*Rubus armeniacus*
Sheep sorrel	*Rumex acetosella*
Curly dock	*Rumex crispus*
Fiddleleaf dock	*Rumex pulcher*
Arroyo willow	*Salix lasiolepis*
Blue elderberry	*Sambucus nigra ssp. caerulea*
Poison sanicle	*Sanicula bipinnata*
Purple sanicle	*Sanicula bipinnatifida*
California bee plant	*Scrophularia californica*
Old man of spring	*Senecio vulgare*
Field madder	*Sherardia arvensis*
Windmill pinks	*Silene gallica*
Milk thistle	*Silybum marianum*
Blue-eyed grass	*Sisyrinchium bellum*
White nightshade	*Solanum americanum*
South American soliva	*Soliva sessilis*
Sow thistle	*Sonchus oleraceus*
White hedge nettle	*Stachys albens*
Hedge nettle	*Stachys pycnantha*
Purple needlegrass	*Stipa pulchra*
Tall sock-destroyer	*Torilis arvensis*
Dwarf sack clover	*Trifolium depauperatum*
Poison-oak	*Toxicodendron diversilobum*
Hop clover	*Trifolium dubium*
Strawberry clover	*Trifolium fragiferum*
Rose clover	*Trifolium hirtum*
Thimble clover	*Trifolium microdon*
Subterranean clover	*Trifolium subterraneum*
White tipped clover	*Trifolium variegatum*
Ithuriel's spear	*Triteleia laxa*
California bay	*Umbellularia californica*
Dwarf nettle	*Urtica urens*
Spring vetch	*Vicia sativa*
Winter vetch	*Vicia villosa*
California golden violet	*Viola pedunculata*
Narrow leaf mule ears	*Wyethia angustifolia*
Spiny cocklebur	*Xanthium spinosum*
Muehlenberg's centaury	*Zeltnera muehlenbergii*
ANIMALS	

red-winged blackbird	*Agelaius phoeniceus*
American pipit	*Anthus rubescens*
western scrub-jay	*Aphelocoma californica*
yellow faced bumblebee	*Bombus* sp.
cow	*Bos taurus*
California toad	*Bufo boreas halophilus*
red-tailed hawk	*Buteo jamaicensis*
red-shouldered hawk	*Buteo lineatus*
Anna’s hummingbird	*Calypte anna*
turkey vulture	*Cathartes aura*
killdeer	*Charadrius vociferus*
Northern harrier	*Circus hudsonius*
California striped racer	*Coluber lateralis lateralis*
rock dove	*Columbia livia*
American crow	*Corvus brachyrhynchos*
common raven	*Corvus corax*
horse	*Equus caballus*
Brewer’s blackbird	*Euphagus cyanocephalus*
American kestrel	*Falco sparverius*
Feral cat	*Felis catus*
house finch	*Haemorhous mexicanus*
barn swallow	*Hirundo rustica*
black-tailed jackrabbit	*Lepus californicus*
song sparrow	*Melospiza melodia*
California towhee	*Melozone crissalis*
California vole	*Microtus californicus*
northern mockingbird	*Mimus polyglottos*
brown-headed cowbird	*Molothrus ater*
Columbian black-tailed deer	*Odocoileus hemionus columbianus*
California ground squirrel	*Otospermophilus beecheyi*
savannah sparrow	*Passerculus sandwichensis*
deer mouse	*Peromyscus maniculatus*
Cliff swallow	*Petrochelidon pyrrhonota*
raccoon	*Procyon lotor*
bushtit	*Psaltriparus minimus*
Sierran treefrog	*Pseudacris sierra*
skipper butterfly	*Pyrginae*
black phoebe	*Sayornis nigricans*
Say’s phoebe	*Sayornis saya*
northwestern fence lizard	*Sceloporus occidentalis occidentalis*
Yellow-rumped warbler	*Setophaga coronata*
Callippe silverspot butterfly	*Speyeria callippe callippe*
lesser goldfinch	*Spinus psaltria*
American goldfinch	*Spinus tristis*
northern rough-winged sparrow	*Stelgidopteryx serripennis*
western meadowlark	*Sturnella neglecta*

European starling	*Sturnus vulgaris*
violet green swallow	*Tachycineta thalassina*
northern rough-skinned newt	*Taricha granulosa granulosa*
Botta’s pocket gopher	*Thomomys bottae*
Bewick’s wren	*Thryomanes bewickii*
Western kingbird	*Tyrannus verticalis*
mourning dove	*Zenaida macroura*
golden-crowned sparrow	*Zonotrichia atricapilla*
white-crowned sparrow	*Zonotrichia leucophrys*

Attachment D

USFWS Western Monarch Butterfly Conservation Reccommendations

U.S. FISH & WILDLIFE SERVICE

February 10, 2023

Western Monarch Butterfly Conservation Recommendations:

Purpose: Section 7(a)(1) of the Endangered Species Act of 1973 (ESA), directs federal agencies to use their authorities to further the purpose of the ESA, by conducting conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities that an action agency may undertake to avoid and minimize the adverse effects of a proposed action, implement recovery plans, or to develop information that is useful for the conservation of listed species. The purpose of the following conservation recommendations is to encourage federal agencies to incorporate monarch butterflies into their Environmental Assessments and Biological Assessments associated with Section 7 Biological Opinions, when in consultation with the U.S. Fish & Wildlife Service. These recommendations are organized by habitat zone, so that they may be cut/paste, as applicable and contingent upon project location. There is potential utility for these recommendations beyond Section 7, and they are intended to promote benefits for other pollinators as well.

Background: The western migratory monarch butterfly population has declined by more than 90 percent since the 1980s. An estimated 4.5 million monarchs overwintered on the California coast in the 1980s, whereas in 2022, the population estimate for overwintering monarchs was 335,000 butterflies. The population decline is likely due to multiple stressors across the monarch's range, including the loss and degradation of overwintering habitat; pesticide use, particularly insecticides; loss of breeding and migratory habitat; climate change; parasites and disease. Historically, the majority of western monarchs spent the winter in forested groves near the coast from Mendocino County, California, south into northern Baja California, Mexico. In recent years, monarchs have not clustered in the southern-most or northern-most parts of their overwintering range, and there are year-round residents in some areas of the coast. This resident phenomenon is likely due to a combination of climate change and an abundance of residential-planted non-native, tropical milkweed that is available for monarchs year-round. Migratory western monarchs depart the overwintering sites in mid-winter to early-spring. Throughout the spring and summer, monarchs breed, lay their eggs on milkweed, and migrate across multiple generations within California and other states west of the Rocky Mountains. In an attempt to reverse the severe population decline of western monarch butterflies, and to protect other pollinators as well, we encourage implementation of the conservation recommendations listed below. Please see Figure 1 for suggested areas to focus voluntary conservation actions in California. Western monarch conservation actions outside of California are also important, especially for the larger pollinator community. Recommendations for other western states are addressed in the "All Breeding and Migratory Zones" section of this document.

Please contact Samantha Marcum (samantha_marcum@fws.gov) or Cat Darst (cat_darst@fws.gov) with questions or suggestions on these recommendations.

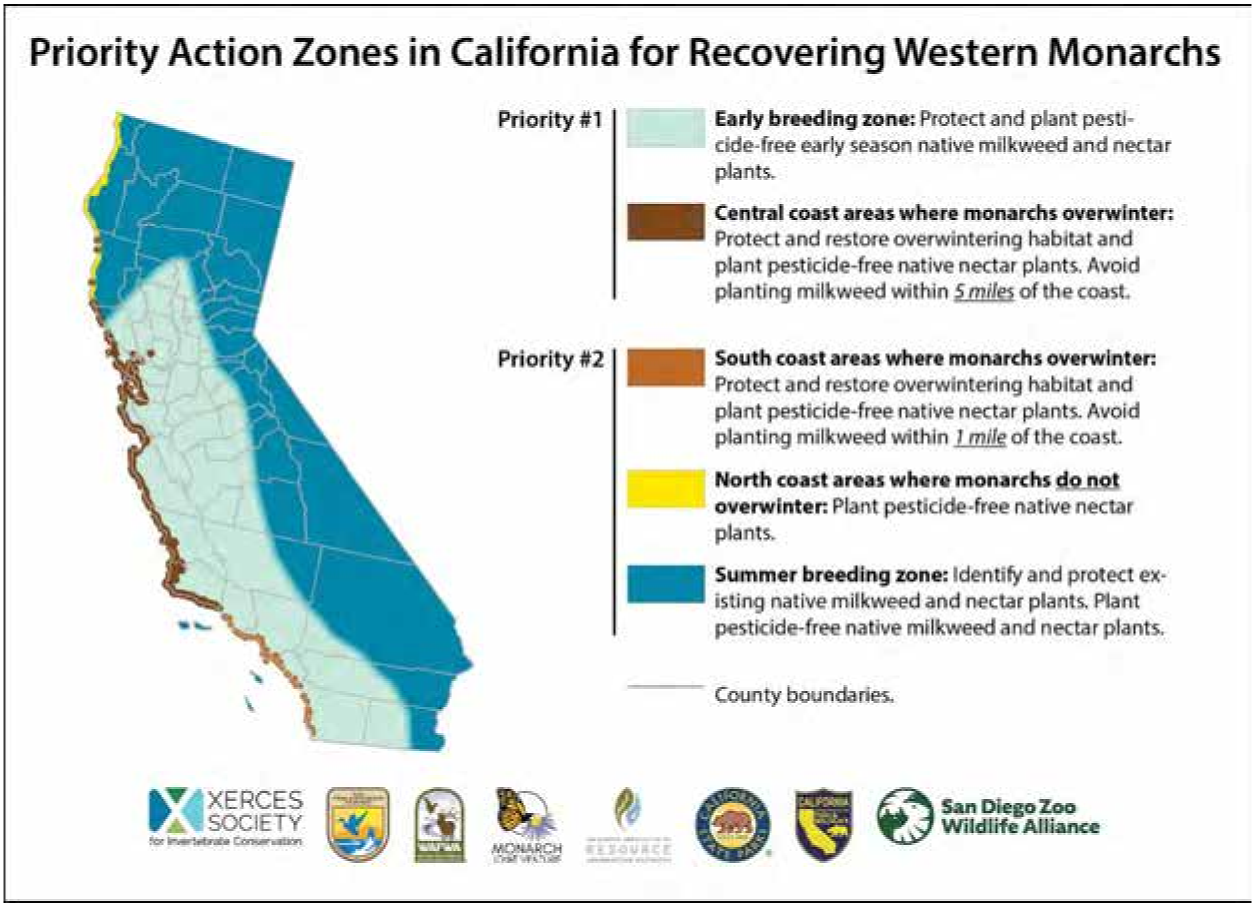


Figure 1. Priority Monarch Habitat Restoration Areas in California.

Coastal California Overwintering Habitat: Western monarchs migrate to the California coast, and cluster in a specific set of forested tree groves during the fall and winter each year. Overwintering sites provide protection from inclement weather and possess suitable vegetation and microclimate conditions for monarchs (e.g., roosting/clustering trees, wind protection, dappled sunlight, nectar sources, water and/or dew for hydration, high humidity, and an absence of freezing temperatures). Overwintering sites consist of a core zone (cluster area), shelter zone (wind protection and outer site boundaries surrounding core zone) and support zone (area within 500 feet of an overwintering site that provides nectar, hydration, and microclimate protection). In the overwintering zone of the coast (i.e., within five miles of the coast from Mendocino County south through Santa Barbara County, and within one mile of the coast from Ventura County south through San Diego County), we recommend the following:

1. Protect, manage, enhance and restore monarch butterfly overwintering sites (Find an Overwintering Site) and surrounding habitat.
2. Use only native, insecticide-free plants for habitat restoration and enhancement actions. If plants are grown via contract, use grow specifications that limit pesticide residues.

3. Conduct overwintering site habitat assessments and develop and implement long-term management plans. Management plan actions may include, but are not limited to:

   a. Enhance habitat within overwintering sites and within 500 feet (support zone) of sites by planting tree species where monarchs are known to cluster (e.g., Monterey pine *(Pinus radiata)*, Monterey cypress *(Cupressus macrocarpa)*, Coast redwood *(Sequoia sempervirens)*, coast live oak *(Quercus agrifolia)*, Douglas fir *(Pseudotsuga menzesii)*, Torrey pine (*Pinus torreyana*), western sycamore *(Platanus racemosa)*, bishop pine *(Pinus muricata)*, as appropriate for location.

   b. Avoid the removal of living trees or shrubs within 500 feet of overwintering sites, except for specific grove enhancement purposes (e.g., if select thinning is recommended to benefit monarchs), and/or for human safety concerns substantiated by a hazard tree assessment. Dead or fallen trees may be removed, chipped, or pile burned within the overwintering site outside of the overwintering season in order to reduce disease and fuels buildup.

   c. Reduce fuel loads and minimize the risk of catastrophic wildfire within overwintering habitat through selective thinning of small diameter (8” or less) trees in the support zone and, in some instances, the shelter zone of overwintering sites. The risks and benefits of fuels management should be assessed on a case-by-case basis for each site.

   d. Conduct management activities (e.g., tree trimming, mowing, burning and grazing) in monarch overwintering sites from March 1-September 30 (outside of estimated timeframe when monarchs are likely present), in coordination with a monarch biologist. Planting trees, shrubs, and forbs (without use of heavy machinery) for restoration is acceptable during the overwintering season.

   e. Enhance nectar sources by planting fall/winter/early spring blooming native forbs, shrubs, or trees within overwintering sites and within five miles of the coast (Nectar Planting Lists).

4. Protect monarchs, other pollinators, and their habitats from pesticides, including insecticides, fungicides and herbicides. Specific recommendations may vary by site.

   a. Avoid the use pesticides within 500 feet of overwintering sites, particularly when monarchs may be present.

   b. Use non-chemical weed and pest prevention and management methods, and monitor pest pressure to minimize reliance on pesticides for managing insects, mites, weeds, and diseases (Cal-IPC Non-chemical BMPs).

   c. If pesticides are used in or adjacent to overwintering habitat, then conduct applications from March 1-September 30, when possible, and adhere to the following guidance to lessen potentially harmful effects:

i. Avoid the use of neonicotinoids or other systemic insecticides, including coated seeds, any time of the year in monarch habitat due to their ecosystem persistence, systemic nature, and toxicity (Xerces Systemic Insecticides List).

ii. Avoid insecticides that target lepidopterans, including biological pesticides (IRAC Lepidoptera Insecticide Mode of Action Classification).

iii. If herbicides are used, apply when plants are more responsive to treatment and when monarchs and other pollinators are less likely to be nectaring on the plants.

iv. Avoid pesticide application to blooming plants when monarchs may be present.

v. Use targeted application methods, avoid large-scale broadcast applications and take precautions to limit off-site movement of pesticides (e.g., drift from wind and discharge from surface water flows).

vi. Protect habitat areas from pesticide drift with a pesticide-free spatial buffer and/or evergreen vegetative buffer of trees with flowers that are not attractive to pollinators. The appropriate width of monarch and pollinator habitat spatial buffers depends on several factors, including weather and wind conditions, but at a minimum, the habitat should be at least 40 feet from ground-based pesticide applications, 60 feet from air-blast sprayers, and 200 feet from aerial applications or any systemic insecticide applications or plants grown from treated seeds.

vii. If pesticides are used for vector control treatments (e.g., mosquitoes), avoid treatment unless monitoring indicates that the species and numbers exceed a public health threshold. For any mosquito treatments, first employ prevention steps such as reducing standing water. Where possible, draw mosquitoes away from sensitive sites (e.g., using dry ice traps) to limit treatment effects in sensitive habitat areas.

5. To assist in maintaining normal migration behavior, do not plant any type of milkweed at or adjacent to overwintering sites.

   a. To minimize the spread of the pathogen *Ophryocystis elektroscirrha* (OE), and to encourage natural monarch migration, do not plant non-native tropical milkweed (*Asclepias curassavica*) anywhere. OE is able to build up on tropical milkweed, because these plants are evergreen, and they do not die back in the winter. OE can be lethal to monarchs.

   b. Remove tropical milkweed and replace with native nectar plants (Nectar Planting Lists).

6. To contribute to regional and population-level assessments, monitor monarchs and assess conditions of overwintering sites during Thanksgiving and New Year's counts. When possible, report when monarchs arrive and depart the overwintering sites each year (Western Monarch Count).

Please contact Samantha Marcum (samantha_marcum@fws.gov) or Cat Darst (cat_darst@fws.gov) with questions or suggestions on these recommendations.

7. To provide benefits for monarchs and other pollinators anywhere along the coast, install a mosaic of native nectar plants that bloom throughout the year (Nectar Planting Lists).

Breeding and Migratory Habitat: Monarch butterflies breed and migrate across multiple generations each year throughout the western U.S. The early breeding zone (i.e., Priority 1 in Figure 1) is an area in California where monarchs likely breed and/or lay their eggs on milkweed after departing the overwintering sites in mid-winter to early spring each year. Early-emerging milkweed species are an important resource for monarchs in the early breeding zone and may be associated with the population trends of western monarchs: these plants are essential to create the next generation of migratory butterflies. For monarch breeding and migratory habitat, we recommend the following:

Priority 1 Zone:

1. Enhance and maintain habitat in the early breeding zone of California, by identifying and protecting existing habitat, planting native, insecticide-free milkweed, including early-emerging species (e.g., *Asclepias vestita*, *A. californica, A. cordifolia, A. erosa*), and planting native nectar plants that are available to monarchs in late winter, spring and fall (January-April, August-October) (Nectar Planting Lists; Milkweed Seed Finder).

For All Breeding and Migratory Zones:

2. Use only native, insecticide-free plants for habitat restoration and enhancement actions. If plants are grown via contract, use grow specifications that limit harmful pesticide residues.

3. Enhance and maintain habitat in the Priority 2 zone of California (Figure 1, above) and in other western States, by identifying and protecting existing habitat, and planting milkweed species and flowering plants that are appropriate for the location (Nectar Planting Lists; Milkweed Seed Finder).

4. Conduct management activities such as mowing, burning and grazing in monarch breeding and migratory habitat outside of the estimated timeframe when monarchs are likely present, as is feasible (Figure 2, Recommended Management Timing Map, below).

5. Protect monarchs, other pollinators, and their habitats from pesticides, including insecticides, fungicides and herbicides.

   a. Use non-chemical pest prevention and management methods and monitor pest pressure to minimize reliance on pesticides for managing insects, mites, weeds, and diseases. For example, employ non-chemical weed control techniques, when feasible (Cal-IPC Non-chemical BMPs).

   b. If pesticides are used in monarch habitat, lessen their potential for harm by adhering to the following guidance:

i. Avoid the use of neonicotinoids or other systemic insecticides, including coated seeds, any time of the year in monarch habitat due to their ecosystem persistence, systemic nature, and toxicity (Xerces Systemic Insecticides List).

ii. Avoid the application of pesticides on milkweed plants and define buffer zones to protect habitat from nearby areas where pesticides are applied (See ix, below).

iii. Avoid the application of pesticides on blooming plants when adult monarchs may be present, when feasible (Figure 2, Recommended Management Timing Map, below).

iv. Conduct applications outside of the time period when monarchs are expected to be present (Figure 2, Recommended Management Timing Map, below).

v. Avoid insecticides that target lepidopterans, including biological pesticides (IRAC Lepidoptera Insecticide Mode of Action Classification).

vi. Avoid the use of strobilurin fungicides on milkweeds.

vii. If herbicides are used, apply when plants are more responsive to treatment, and when monarchs and other pollinators are less likely to be nectaring on the plants.

viii. Use targeted application methods, avoid large-scale broadcast applications, and take precautions to limit off-site movement (e.g., wind drift, discharge from surface water flows).

ix. Protect habitat areas from pesticide drift with a pesticide-free spatial buffer and/or evergreen vegetative buffer of trees with flowers that are not attractive to pollinators. The appropriate width of monarch and pollinator habitat spatial buffers depends on several factors, including weather and wind conditions, but at a minimum, the habitat should be at least 40 feet from ground-based pesticide applications, 60 feet from air-blast sprayers, and 200 feet from aerial applications or any systemic insecticide applications or plants grown from treated seeds.

x. If pesticides are used for vector control treatments (e.g., mosquitoes), avoid treatment unless monitoring indicates that the species and numbers exceed a public health threshold. For any mosquito treatments, first employ prevention steps such as reducing standing water. Where possible, draw mosquitoes away from sensitive sites (e.g., using dry ice traps) to limit treatment effects in sensitive habitat areas.

6. To minimize the spread of the pathogen *Ophryocystis elektroscirrha* (OE), do not plant non-native tropical milkweed (*Asclepias curassavica*) anywhere. OE can build up on tropical milkweed and infect monarchs, because these plants are evergreen and do not die back in the winter. OE can be lethal to monarchs.

Please contact Samantha Marcum (samantha_marcum@fws.gov) or Cat Darst (cat_darst@fws.gov) with questions or suggestions on these recommendations.

7. Remove tropical milkweed and replace with native milkweed and nectar plants appropriate for the location (Nectar Planting Lists; Milkweed Seed Finder).

8. Report milkweed and monarch observations from all life stages, including breeding butterflies, to the Western Monarch Milkweed Mapper or via the project portal in the iNaturalist smartphone app.

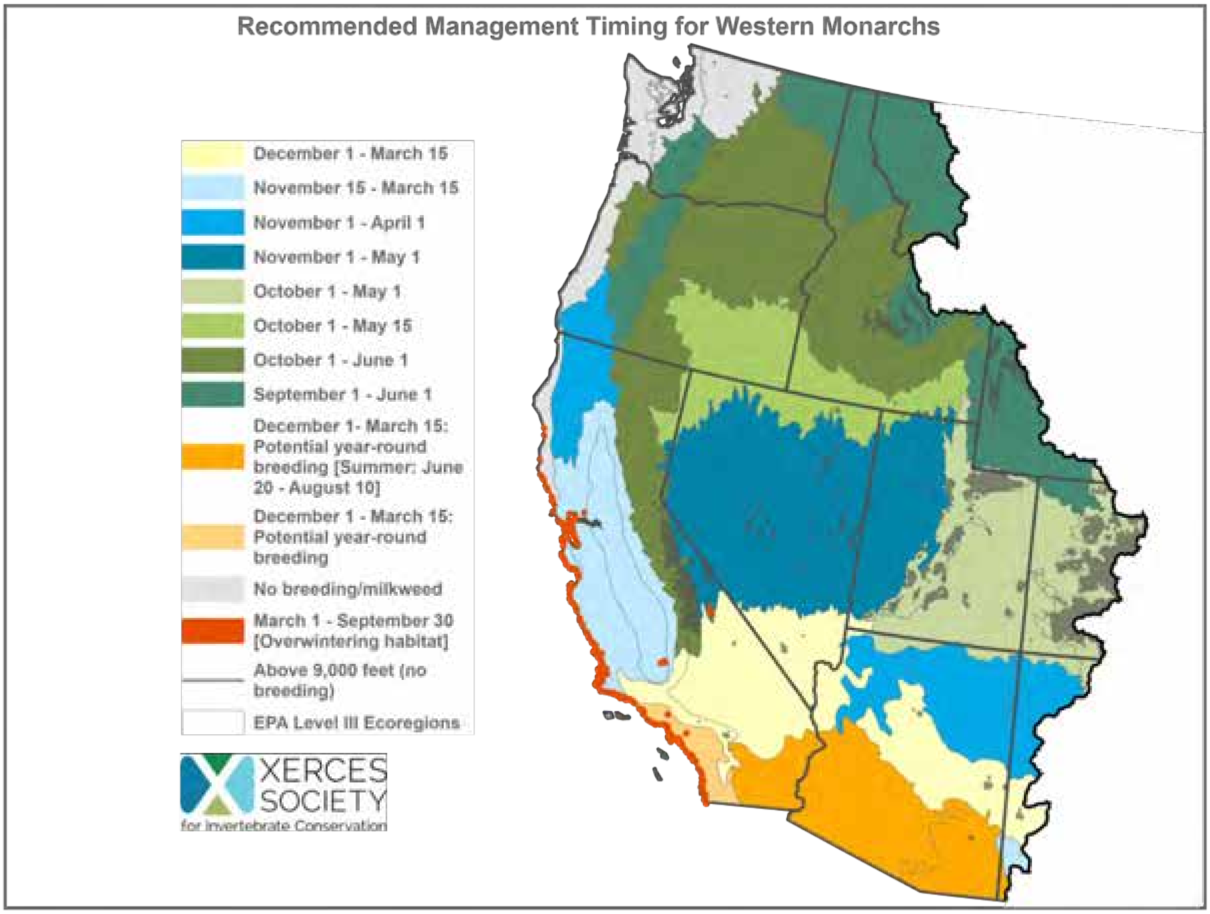


Figure 2. Recommended management windows in the western U.S. by zone.

Notes: The management timing windows illustrated in Figure 2 represent approximate recommendations of timeframes to conduct management actions. These timeframes are based upon the best available current information and may be updated in the future. Each year and site is different, so when possible, please consider surveying milkweed plants for the early life stages of monarchs prior to burning, mowing, grazing or applying pesticides.

Please contact Samantha Marcum (samantha_marcum@fws.gov) or Cat Darst (cat_darst@fws.gov) with questions or suggestions on these recommendations.

Appendix H-2

Aquatic Resources Delineation

AQUATIC RESOURCES DELINEATION

Scotts Valley 160-acre Fee-to-Trust Project

Prepared for: U.S. Army Corps of Engineers
June 2024

acorn environmental

Table of Contents

Tables

Figures

List of Attachments

Section 1 | Introduction

1.1 PURPOSE AND SCOPE OF REPORT

Acorn Environmental conducted a formal delineation of jurisdictional water bodies within the approximately 160-acre Study Area located in the City of Vallejo, Solano County, California. This report presents the results of the field survey conducted in accordance with the USACE Wetlands Delineation Manual to determine which portions of the Study Area may qualify as potentially jurisdictional waters of the United States. USACE is ultimately responsible for determining the limits of their jurisdiction, and this report has been prepared to assist the USACE with their determination. This report also identifies which portions of this property may qualify as potentially jurisdictional waters of the State of California. The State of California is ultimately responsible for determining the limits of their jurisdiction, and this report has also been prepared to assist State agencies with their determination.

1.2 DESCRIPTION OF STUDY AREA

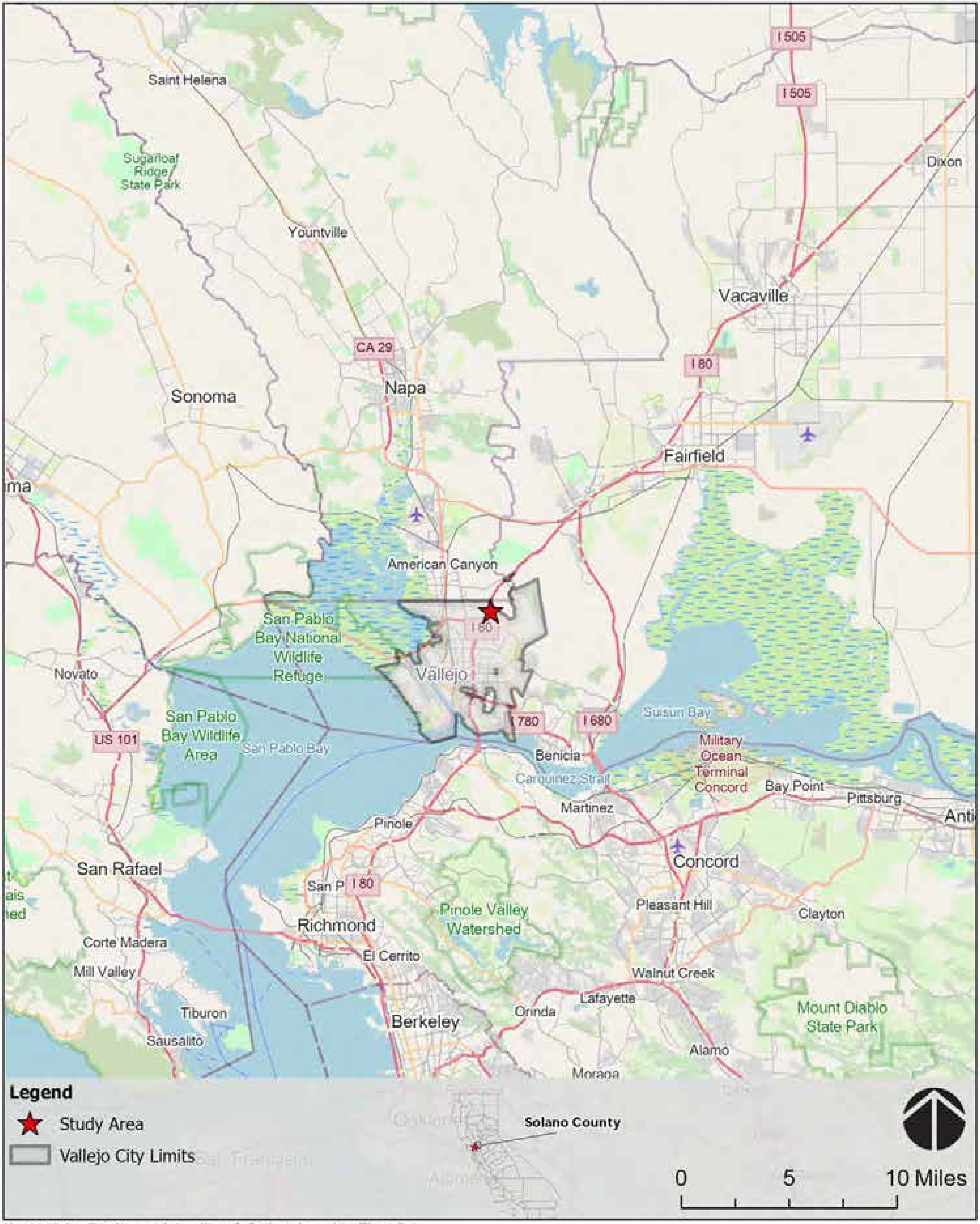
Figure 1 and **Figure 2** show the location of the Study Area, and **Figure 3** presents an aerial photograph of the Study Area and the immediate vicinity. The Study Area is located at the northeast corner of the intersection of Interstate 80 (1-80) and Columbus Parkway in Vallejo, California, Section 5, Township 3 North, Range 3 West, and Section 32, Township 4 North, Range 3 West, Mount Diablo Base and Meridian within the Cordelia 7.5-minute U.S. Geological Survey (USGS) quadrangle. The Study Area consists of four parcels totaling 160 acres: Assessor's Parcel Numbers (APNs) 182-010-010, 0182-020-010, 0182-020-020, and 0182-020-080).

1.3 REGULATORY SETTING

Real property in California that contains water resources is subject to various federal and state regulations, and activities occurring in these water resources may require permits, licenses, variances, or similar authorization from federal, state and local agencies. Following is a brief, but not exhaustive, summary of such regulations, as they apply particularly to field delineations of jurisdictional waterbodies.

Federal Regulations

At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. In Section 404 of the CWA, waters of the US are defined as: all waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters (33 CFR Part 328).



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

FIGURE 1
REGIONAL LOCATION

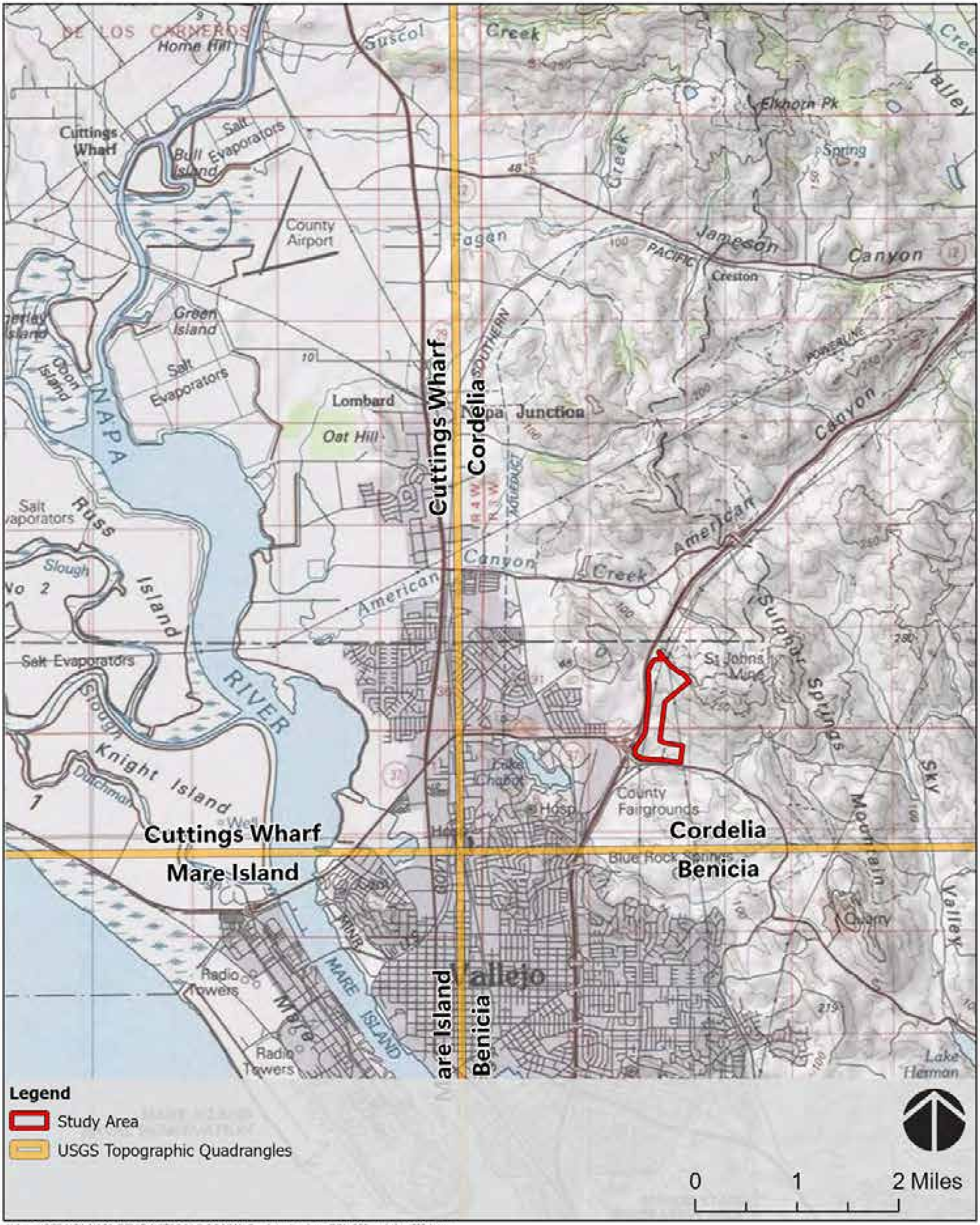


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FIGURE 2

USGS TOPOGRAPHIC

Esri Community Maps Contributors, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census

FIGURE 3
AERIAL OVERVIEW

With non-tidal waters, in the absence of adjacent wetlands, the extent of federal jurisdiction is defined by the ordinary high water mark - the line on the shore established by the fluctuations of water, and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, or the presence of litter and debris. Wetlands are defined as: "…those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." (Federal Register 1980, 1982).

Any person, firm, or agency planning to alter of work in navigable waterbodies, including the discharge of dredged or fill material, must first obtain authorization from the United States Army Corps of Engineers (USACE). Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) prohibits the obstruction or alteration of navigable waters of the US without a permit from USACE. Section 301 of the Federal Water Pollution Control Act, as amended ("Clean Water Act") prohibits the discharge of pollutants, including dredged or fill material, into waters of the US without a Section 404 permit from USACE (33 USC 1344). If the proposed project involves species (or their habitat) listed under the federal Endangered Species Act of 1973, USACE must initiate consultation with United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service pursuant to Section 7 (16 USC 1536; 40 CFR Part 402). Wetland features that exhibit vernal pool characteristics may be protected under the federal Endangered Species Act or California Endangered Species Act, because several crustaceans listed as threatened or endangered are dependent upon vernal pool habitat.

Under CWA Section 401, every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain certification that the proposed activity will comply with State water quality standards. The applicable Regional Water Quality Control Board must certify that a USACE Section 404 Permit action meets state water quality objectives by issuing a Water Quality Certification. California Department of Fish and Game provides comment on USACE permit actions under the Fish and Wildlife Coordination Act. Under CWA Section 402, any construction project that disturbs at least one acre of land requires enrollment in the State's construction general permitting program under the National Pollutant Discharge Elimination System and implementation of a storm water pollution prevention plan.

State Regulations

Waters of the State are regulated primarily under the California Water Code and the California Code of Regulations Title 23: Water and Title 27: Environmental Protection. All water features in California, on public and private lands, in both natural and artificial channels, including isolated wetland features and impermanent drainages that are not claimed as waters of the US, are considered waters of the State. Waters of the State are protected under the Porter-Cologne Water Quality Control Act (California Water Code, Division 7: Water Quality) and are regulated by the State Water Resources Control Board (SWRCB) and its 9 Regional Water Quality Control Boards.

All parties proposing to discharge materials that could affect waters of the State must file a report of waste discharge with the appropriate regional board. The regional board will then respond to the report by issuing waste discharge requirements (WDRs) in a public hearing, or by waiving WDRs (with or without conditions) for that proposed discharge. Both of the terms "discharge of waste" and "waters of the State" are broadly defined in the Porter-Cologne Act, such that discharges of waste include fill, any material resulting from human activity (including construction), or any other "discharge" that may directly or indirectly impact waters of the State.

Additional statewide regulations that protect wetlands and riparian areas include the Wetlands Conservation Policy (Executive Order W-59-93), also known as the State's "No Net Loss" Policy for Wetlands; and the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (State Water Board Resolution No. 2004-0030).

California Fish and Game Code (§1600-1607, 5650F) protects fishery resources by regulating "...any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." California Department of Fish and Wildlife (CDFW) requires notification prior to project commencement, and issuance of a Lake or Streambed Alteration Agreement, if a proposed project will result in the alteration or degradation of waters of the State. The limit of CDFW jurisdiction is currently interpreted to be the "stream zone", defined as "that portion of the stream channel that restricts lateral movement of water" and delineated at "the top of the bank or the outer edge of any riparian vegetation, whichever is more landward". CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the CDFW and the applicant is the Streambed Alteration Agreement.

Section 2 | Environmental Setting

The Study Area is located within the Central Coast geographic subregion, which is contained within the Central Western California region of the larger California Floristic Province (Baldwin et al. 2012).

The Study Area falls within Climate Zone 17 “Marine effects in Southern Oregon, Northern, and Central California.” Climate Zone 17 experiences a mild climate with cool, wet winters and cool summers with frequent fog and wind. Temperatures in this zone do not fall below 20 degrees Fahrenheit with an average high of 97 degrees Fahrenheit (Sunset, 2024).

The topography of the Study Area ranges from flat in the southern portion of the Study Area, to steep in the northern portion. Elevations on the site range from 130 feet in the southern portion of the site to approximately 800 feet on the northern portion. The Study Area is currently undeveloped open space, transmission power corridor, and pasture and equine facilities. Surrounding development includes commercial development to the south, rangeland to the north and east, and highways, a large vista rest stop, and residential developments to the west.

Section 3 | Methods

The delineation was conducted in accordance with the manuals relevant to the region, including the following:

- 1987 Corps of Engineers Wetland Delineation Manual
- 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)
- 2008 A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States.
- 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). U.S. Army Engineer Research and Development Center Environmental Laboratory, Vicksburg, MS. 153 pp.

3.1 PRELIMINARY DATA GATHERING AND RESEARCH

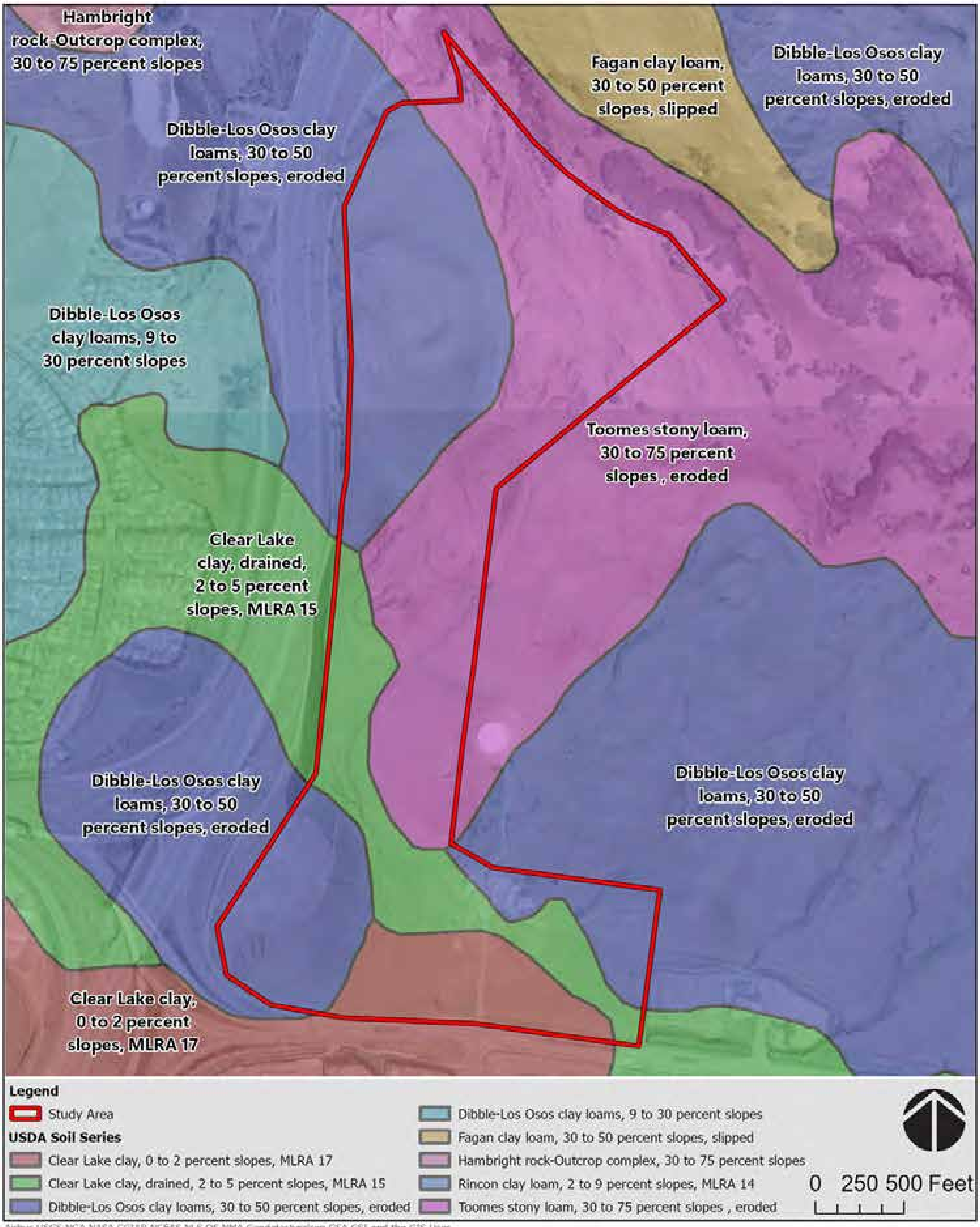
Prior to conducting the field survey, the following information sources were reviewed:

- USGS 7.5-degree minute topographic quadrangle maps and aerial photography;
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey maps (**Figure 4**);
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate (Flood Hazard Boundary) Maps;
- USFWS National Wetland Inventory Maps (**Figure 5**); and
- Previously prepared environmental reports for the Study Area.

3.2 DETERMINATION PROCEDURES

The purpose of the field determination was to: 1) identify water features that are subject to federal jurisdiction within the Study Area; and 2) if present, determine the boundary of each water feature. The entire Study Area was assessed in such a manner as to view all areas to the degree necessary to determine the vegetation community types and the presence or absence of jurisdictional water features. Wetland field determination procedures followed the USACE Wetlands Delineation Manual technical guidelines for a Level 2 Routine Field Determination (Environmental Laboratory 1987). Additionally, the appropriate USACE regional supplement was also consulted.

The diagnostic environmental characteristics of hydrophytic vegetation, hydric soils, and wetland hydrology (i.e., 3-parameter approach) were used as the standard for determining if specific areas qualified as wetlands (Environmental Laboratory 1987). A subject area was determined to be a wetland if all 3 requisite characteristics were present; as a general rule, evidence of a minimum of one positive indicator for each parameter must be found in order to make a positive wetland determination. These parameters are discussed below.



Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community, Yolo County, Maxar

FIGURE 4
USDA SOIL SERIES

FIGURE 5

NATIONAL WETLAND INVENTORY

Hydrophytic Vegetation

Hydrophytic vegetation is defined as "...*the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils sufficient in duration to exert a controlling influence on the plant species present*." (Environmental Laboratory 1987). Hydrophytic vegetation indicators included: prevalence of vegetation; majority of dominant plant species are obligate or facultative wetland plants (hydrophytes); morphological or physiological adaptations to saturated soil conditions; and species listed on the National List of Plant Species that Occur in Wetlands (USACE 2024). This National List divides plant species into categories based upon their frequency of occurrence in wetlands. These categories are: OBL = obligate wetland plants that occur almost always in wetlands under natural conditions (estimated probability greater than 99%); FACW = facultative wetland plants that usually occur in wetlands, but occasionally occur in non-wetlands (estimated probability 67 – 99%); FAC = facultative wetland plants that are equally likely to occur in wetlands or non-wetlands (estimated probability 34 – 66 %); FACU – facultative upland plants that usually occur in non-wetlands, but occasionally are found in wetlands (estimated probability 1 – 33 %); UPL = obligate upland plants that almost always occur in non-wetlands (estimated probability greater than 99%); NI and UNK = insufficient information to determine status; NL = not listed; NA = no agreement by Regional Panel on status; NO = species does not occur in specified region; * (asterisk) indicates tentative assignment; + (positive) or – (negative) sign indicates higher or lower frequency in its category, respectively. During field investigations, the percentage of hydrophytic plant coverage was determined based on the ratio of wetland indicator species coverage present to the total plant coverage present. More than 50 percent of the dominant plant species cover must be FAC, FACW, or OBL to meet the hydrophytic vegetation criterion.

Hydric Soils

Hydric soils are defined as soils that are "...formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." (Environmental Laboratory 1987). A minimum one week of inundation or 14 consecutive days of saturation during the growing season is a typical requirement. The criteria for establishing the presence of hydric soils vary among different soil types and drainage classes. Hydric soil indicators include evidence of reducing or redoximorphic conditions (including sulfidic odor, organic streaking), gleyed, mottled, or low-chroma soils, iron and manganese concretions, and low dissolved oxygen concentration (aquic moisture regime); organic soils (histosols); or mineral soils saturated and rich in organics (histic epipedon) (NRCS 2006). Richardson and Vepraskas (2001) present a thorough discussion of wetland soil science. In the absence of visible field indicators, hydric soil conditions may be determined according to two criteria: 1) all dominant plant species have an indicator status of OBL and/or FACW (at least one dominant plant species must be OBL); and 2) areas below the level of ordinary high water are frequently flooded for long duration or very long duration during the growing season and possess and aquic (reducing) moisture regime. Soils are also classified as hydric on non-hydric by NRCS (2024).

Wetland Hydrology

Wetland hydrology "...*encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season*" (Environmental Laboratory 1987). Many factors influence site-specific hydrology, including the precipitation, stratigraphy, topography, soil permeability, and plant cover of the site. In general, inundation or saturation must occur for at least 5 percent of the growing season to qualify as wetland hydrology. The degree of inundation or saturation at the subject site can vary widely from year to year depending on rainfall patterns within the watershed. Primary wetland hydrology indicators include visual observations of inundation or soil saturation, water marks and water-stained leaves, sediment deposits, drift lines, and drainage patterns in wetlands.

Data Collection Procedures

Sampling locations were established within potential wetland areas and within adjacent uplands, where present, to determine the boundary of wetlands. At each sampling point, the location was georeferenced using a GPS receiver and marked on an aerial photograph; a numbered pin flag or lathe was placed, where necessary, to assist other surveyors. Information on vegetation, soils, and hydrology was recorded on a USACE Routine Wetland Determination Data Form.

Dominant and subdominant plant species in each vegetative stratum (e.g., tree, shrub, forb) that occurred within approximately 5 to 10 feet of the sampling point were identified and recorded, and their wetland indicator status determined. All visible flora observed were recorded in a field notebook and identified to the lowest possible taxon; a hand lens was used where necessary. When a specimen could not be identified in situ, a photograph or voucher specimen (depending upon scientific permit requirements) was taken and identified later in the laboratory using a dissecting scope where necessary. Taxonomic determinations and nomenclature followed these references: plants—Pavlik (1991), Brenzel (2007), Stuart and Sawyer (2001), Lanner (2002), Baldwin et al. (2012), Calflora (2024), University of California at Berkeley (2024 a, b).

Where necessary, a soil pit was dug with a spade to expose at least 16 inches of soil profile, and the sample evaluated for hydric soil indicators. Munsell Soil Color Charts (2000 edition, Gretagmacbeth, Inc.) were used to determine soil matrix and mottle color (hue, value, and chroma), and soil type and particle size was also noted. NRCS (1999) Soil Taxonomy handbook was referenced for soil classification where necessary. Based on the results of the 3-parameter test, the extent of each potential wetland was mapped in the field using a GPS receiver capable of submeter accuracy and/or demarcated on aerial photographs for later “heads-up” digitization. Wetlands and other aquatic habitats were classified using the USFWS “Classification System for Wetland and Deepwater Habitats”, or “Cowardin class” (Cowardin et al., 1979; USFWS 2014). A determination was made whether normal environmental conditions exist; atypical conditions followed a modified procedure described in the USACE Manual (Environmental Laboratory 1987). Geographic analyses, including acreage calculations, were performed using geographical information system software (ArcGIS 10, ESRI, Inc.).

For identification of water features other than wetlands that are subject to federal or State jurisdiction, 2 principal field characteristics were evaluated: 1) the presence of a channel; and 2) the presence of an ordinary high water mark. The ordinary high water mark is defined in 33 CFR Part 329.11 as the line on the shore established by the fluctuations of water, and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, or the presence of litter and debris. Other characteristics were noted, where possible: description of hydrologic feature type, length, approximate discharge volume, gradient, range between low and high water mark, width of riparian vegetation, etc. For determination of whether these water bodies constituted waters of the US, USACE regulations (33 CRF 328) were consulted. Data sheets for these non-wetland water bodies were completed at representative locations and were included in **Attachment A**.

Regulatory Considerations

A joint USEPA/USACE memorandum dated 2008 provided guidance to implementing the Supreme Court's decision in the consolidated cases Rapanos v. United States and Carabell v. United States (hereafter referred to simply as "Rapanos") which addressed the jurisdiction over waters of the United States under the Clean Water Act. In Rapanos, the Supreme Court restricted where the federal government can apply the Clean Water Act, specifically by determining whether a wetland or tributary is a "water of the United States." According to USEPA & USACE (2008), jurisdiction will continue to be asserted over "all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide." These waters are referred to as traditional navigable waters. The agencies will also continue to assert jurisdiction over wetlands adjacent to traditional navigable waters, where "adjacent" means "bordering, contiguous, or neighboring." Finding a continuous surface connection is not required to establish adjacency under this definition (USEPA & USACE 2008).

A non-navigable tributary of a traditional navigable water is a non-navigable water body whose waters flow into a traditional navigable water either directly or indirectly by means of other tributaries. Clean Water Act jurisdiction will continue to be held over non-navigable tributaries that are "relatively permanent" – waters that typically (e.g., except due to drought) flow year-round or waters that have a continuous flow at least seasonally (e.g., typically three months). Justice Scalia emphasizes that relatively permanent waters do not include tributaries "whose flow is 'coming and going at intervals...broken, fitful.'" Therefore, "relatively permanent" waters do not include ephemeral tributaries which flow only in response to precipitation and intermittent streams which do not typically flow year-round or have continuous flow at least seasonally (USEPA & USACE 2008). However, CWA jurisdiction over these waters will be evaluated under the significant nexus standard described next.

The agencies will assert jurisdiction over the following types of waters when they have a significant nexus with a traditional navigable water: (1) non-navigable tributaries that are not relatively permanent, (2) wetlands adjacent to non-navigable tributaries that are not relatively permanent, and (3) wetlands adjacent to, but not directly abutting, a relatively permanent tributary (e.g., separated from it by uplands, a berm, dike or similar feature). The agencies will assess the flow characteristics and functions of the tributary itself, together with the functions performed by any wetlands adjacent to that tributary, to determine whether collectively they have a significant nexus with traditional navigable waters. A waterbody possesses the requisite nexus, and thus becomes jurisdictional, if the waterbody, either alone or in combination with similarly situated lands in the region, significantly affects the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable' (USEPA & USACE 2008).

To assist in the interpretation of the Rapanos criteria, the USACE Jurisdictional Determination Form Instructional Guidebook was consulted (USACE & USEPA 2007).

Section 4 | Results

4.1 FIELD SURVEY

Dr. G.O. Graening conducted the field assessment on April 3 and May 4, 2024. Complete coverage, variable-intensity pedestrian surveys were performed of the Study Area, modified to account for differences in terrain, vegetation density, and visibility. Sampling points were established at key locations and analyzed for the presence or absence of wetland (or for channels, ordinary high water mark) indicators; these points are documented in the Data Sheets in **Attachment A**. The results of the analyses of Study Area vegetation, soils, and hydrology are presented in the following sections, followed by the recommended jurisdictional determination.

4.2 VEGETATION

The Study Area is located within the Central Coast geographic subregion, which is contained within the Central Western California region of the larger California Floristic Province (Baldwin et al. 2012). The Study Area falls within Climate Zone 17 "Marine effects in Southern Oregon, Northern, and Central California." Climate Zone 17 experiences a mild climate with cool, wet winters and cool summers with frequent fog and wind. Temperatures in this zone do not fall below 20 degrees Fahrenheit with an average high of 97 degrees Fahrenheit (Sunset, 2024).

The Study Area currently contains the following terrestrial natural communities/habitat types:

- Ruderal/developed
- Riparian scrub
- Freshwater marsh
- Pasture
- Annual grassland/rock outcrop
- Oak woodland

Classification and description of terrestrial plant communities follows the methodology accepted by CDFW (2014b), which is based upon Sawyer and Keeler-Wolf's (1995) Manual of California Vegetation. Plant specimens difficult to identify were sent fresh to the Jepson Herbarium (University of California at Berkeley). Obligate wetland plants are present within the Study Area. Habitats are shown on **Figure 6** and are discussed below. **Attachment B** contains a table of plant species observed within the Study Area, and site photos are provided in **Attachment C**.

Ruderal/Developed

Ruderal/developed habitats are those areas that are highly modified from their natural state and are subject to intensive land management, paving, or similar. Within the Action Area, ruderal developed areas included an unpaved access drive and informal parking areas, fencing, and horse shelters. Vegetation was sparse to absent in this area. Where vegetation did occur, it was dominated primarily by non-native grasses and weedy forbs.

Source: Esri, USDA FSA, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User

FIGURE 6
HABITAT TYPES

Riparian Scrub

The vegetation in the valley foothill riparian scrub habitat found at the site was dominated by arroyo willow (*Salix lasiolepis*) with an understory of primarily Himalayan blackberry (*Rubus discolor*) and poison oak (*Toxicodendron diversilobum*) and limited areas of broad-leaved cattail (*Typha latifolia*). Vegetation along the edge of the riparian habitat included sweet fennel (*Foeniculum vulgare*) and coyote brush (*Baccharis pilularis*).

Freshwater Marsh

Freshwater marsh habitat was observed within the on-site drainages. Vegetation within the freshwater marsh includes perennial ryegrass (*Lolium perenne*), common monkeyflower (*Mimulus guttattus*), Bermuda grass (*Cynodon dactylon*), curly dock (*Rumex crispus*), rushes (*Juncus* sp.), pennyroyal (*Mentha* sp.), as well as limited areas of broad-leaved cattail (*Typha latifolia*).

Pasture

The majority of the Study Area is a simplified non-native grassland containing perennial ryegrass (*Lolium perenne*), wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), and other pasture grasses. These areas are subject to significant grazing pressure, and may have been plowed or conditioned previously. Non-native forbs are abundant, such as thistles (*Silybum*, *Carduus*), filarees (*Erodium*), star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echioides*), poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), and spiny cocklebur (*Xanthium spinosum*). Large patches of artichoke thistle (*Cynara cardunculus*) were also observed within this habitat.

Annual Grassland/Rock Outcrop

Species occurring in the annual grassland area are primarily non-native grasses common to disturbed environments. Plant species common in the grassland area include perennial ryegrass (*Lolium perenne*), wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), tarweed (*Hemizonia* sp.) and star thistle (*Centaurea solstitialis*), with other less common species identifiable at this time of year including bristly ox-tongue (*Picris echioides*), poison hemlock (*Conium maculatum*), sweet fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*) and spiny cocklebur (*Xanthium spinosum*). Metamorphic rock outcrops were located sporadically throughout the northern portion of this habitat. Large patches of artichoke thistle (*Cynara cardunculus*) were also observed within this area.

Oak Woodland

A narrow strip of oak woodland occurs along the northern boundary of the Action Area along a hilltop crest. This habitat contains a significant canopy cover of coast live oak (*Quercus agrifolia*). Ground cover vegetation is similar to species observed within the annual grassland/rock outcrop habitat.

4.3 SOIL TYPES

USDA NRCS mapped soil units occurring within the Study Area are listed and described in **Table 1** below and are shown in **Figure 4**. One soil unit within the Study Area was found to be designated "hydric" by NRCS. NRCS provides this disclaimer: "Lists of hydric soils along with soil survey maps are good off-site ancillary tools to assist in wetland determinations, but they are not a substitute for observations made during on-site investigations."

Table 1: Soils within the Study Area

Soil Type	Soil Characteristics	Hydric Soil?
Dibble-Los Osos clay loam series (30-50% slope, eroded)	Not Prime Farmland Well drained Very high runoff class 80+ inches to groundwater	No
Clear Lake clay series (2-5% slope)	Prime Farmland if irrigated Poorly drained High runoff class 0-48 inches to groundwater	Yes
Toomes stony loam series (30-75% slope, eroded)	Not Prime Farmland Well drained High runoff class 80+ inches to groundwater	No

Source: NRCS, 2024

4.4 HYDROLOGY

Drainage collects in swales and ephemeral channels that run in a southerly direction, and eventually combine into a single channel that flows into a double-pipe culvert. This culvert directs stormwater under Auto Mall Parkway and into Rindler Creek, which is tributary to Lake Chabot. Annual precipitation averages approximately 21 inches (Climate Data, 2024). According to the FEMA Flood Hazard Boundary Map of the region, the Study Area is outside of both the 100-year and 500-year floodplains (FEMA, 2024).

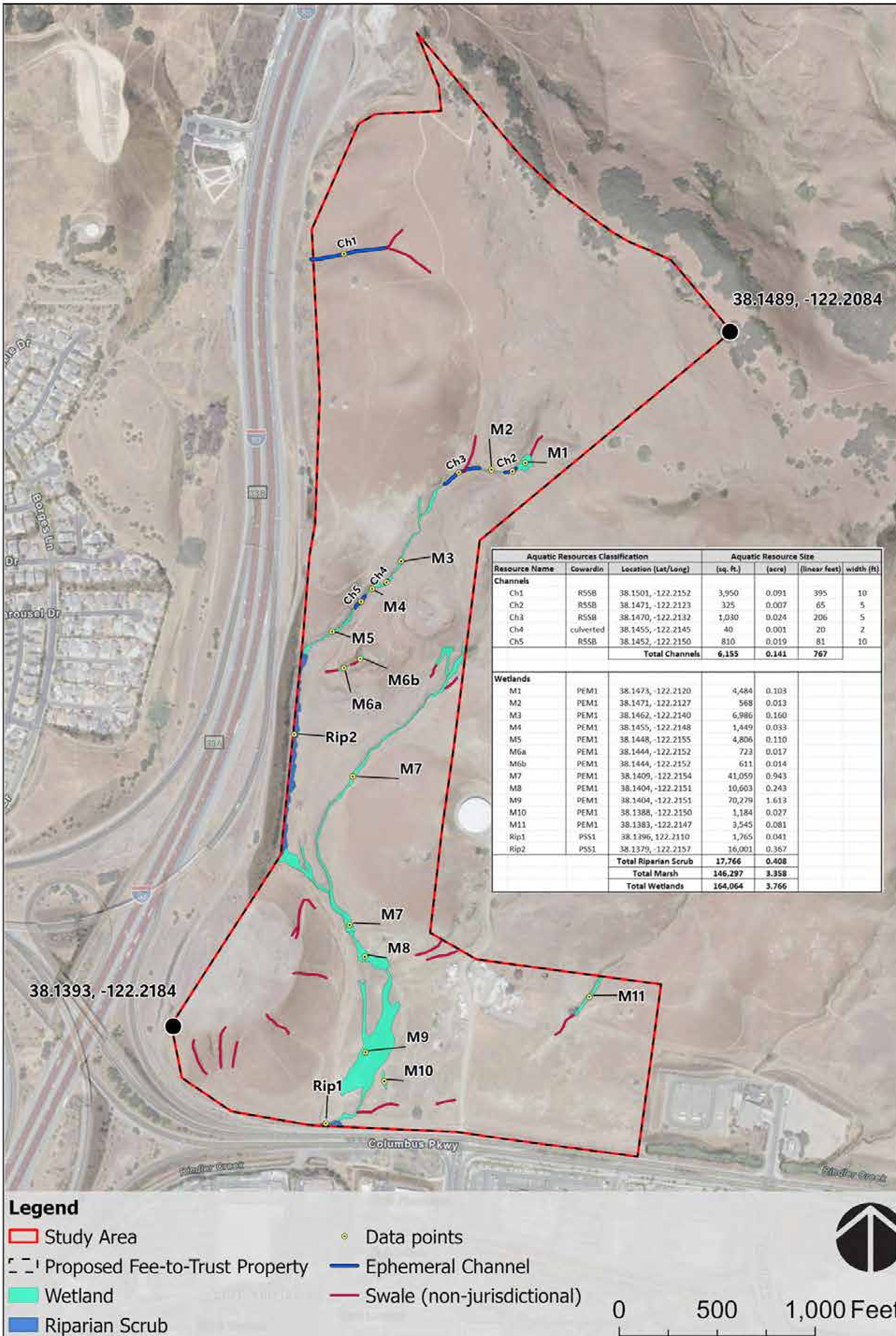
4.5 NATIONAL WETLANDS INVENTORY AND PRIOR DELINEATION EFFORTS

The USFWS National Wetland Inventory (NWI) digital map of the Study Area is included as **Figure 5** and was reviewed prior to the delineation field efforts and visited in the field to verify presence and accuracy of mapping. All NWI features within the Study Area are described as “Riverine” habitat. NWI reports the location of these features as being determined via a review of aerial imagery collected in 2009. Note, however, that this database was not used to conclude that a wetland was present or absent in the Study Area.

A Preliminary Jurisdictional Determination (PJD) was completed for three of the four project parcels: 0182-020-010, 0182-020-020, and 0182-020-080. A previous delineation for these parcels was field verified by the USACE on May 3, 2013 and the revised map was finalized on September 19, 2013 (Corps File No. 26379N, 26381N and 26382N).

4.6 DELINEATION RESULTS AND JURISDICTIONAL RECOMMENDATIONS

All hydrologic features were identified and mapped within the Study Area and subjected to the delineation criteria set forth by each regulatory agency. These features are summarized in the following tables and mapped in **Figure 7**. This map has not been verified by USACE or SWRCB, and thus represents an unofficial



Aquatic Resources Classification			Aquatic Resource Size			
Resource Name	Cowardin	Location (Lat/Long)	(sq. ft.)	(acre)	(linear feet)	width (ft)
Channels						
Ch1	R5SB	38.1501, -122.2152	3,950	0.091	395	10
Ch2	R5SB	38.1471, -122.2123	325	0.007	65	5
Ch3	R5SB	38.1470, -122.2132	1,030	0.024	206	5
Ch4	culverted	38.1455, -122.2145	40	0.001	20	2
Ch5	R5SB	38.1452, -122.2150	810	0.019	81	10
		Total Channels	**6,155**	**0.141**	**767**	
Wetlands						
M1	PEM1	38.1473, -122.2120	4,484	0.103		
M2	PEM1	38.1471, -122.2127	568	0.013		
M3	PEM1	38.1462, -122.2140	6,986	0.160		
M4	PEM1	38.1455, -122.2148	1,449	0.033		
M5	PEM1	38.1448, -122.2155	4,806	0.110		
M6a	PEM1	38.1444, -122.2152	723	0.017		
M6b	PEM1	38.1444, -122.2152	611	0.014		
M7	PEM1	38.1409, -122.2154	41,059	0.943		
M8	PEM1	38.1404, -122.2151	10,603	0.243		
M9	PEM1	38.1404, -122.2151	70,279	1.613		
M10	PEM1	38.1388, -122.2150	1,184	0.027		
M11	PEM1	38.1383, -122.2147	3,545	0.081		
Rip1	PSS1	38.1396, 122.2110	1,765	0.041		
Rip2	PSS1	38.1379, -122.2157	16,001	0.367		
		Total Riparian Scrub	**17,766**	**0.408**		
		Total Marsh	**146,297**	**3.358**		
		Total Wetlands	**164,064**	**3.766**		

Esri Community Maps Contributors, County of Solano, California State Parks, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies,

FIGURE 7
AQUATIC RESOURCE DELINATION MAP

demarcation of the potential limits of jurisdiction. Various survey points were established for the delineation of this Study Area, and corresponding data sheets can be found in **Attachment A**.

Water Resources Potentially Subject to Federal Jurisdiction

Identified hydrologic features were subjected to the three-parameter test, the Hydrology Criterion (Scalia Test), and the Significant Nexus (Kennedy) Test. Based upon these criteria, the following features within the Study Area were determined to be potentially subject to USACE jurisdiction: channel segments Ch1, Ch2, Ch3, Ch4, and Ch5; riverine marshes M1, M2, M3, M4, M5, M6a, M6b, M7, M8, M9, M10, and M11; and riparian scrub Rip1 and Rip2 (see **Table 2** and **Figure 7**).

Table 2: Potentially-Jurisdictional Aquatic Resources

Aquatic Resources Classification			Aquatic Resources Size			
Resource Name	**Cowardin**	**Location (Lat/Long)**	**Square Feet**	**Acres**	**Linear Feet**	**Width (ft)**
CHANNELS						
Ch1	R5SB	38.1501, -122.2152	3,950	0.091	395	10
Ch2	R5SB	38.1471, -122.2123	325	0.007	65	5
Ch3	R5SB	38.1470, -122.2132	1,030	0.024	206	5
Ch4	culverted	38.1455, -122.2145	40	0.001	20	2
Ch5	R5SB	38.1452, -122.2150	810	0.019	81	10
		Total Channels	**6,155**	**0.141**	**767**	**N/A**
WETLANDS						
M1	PEM1	38.1473, -122.2120	4,484	0.103	N/A	N/A
M2	PEM1	38.1471, -122.2127	568	0.013	N/A	N/A
M3	PEM1	38.1462, -122.2140	6,986	0.160	N/A	N/A
M4	PEM1	38.1455, -122.2148	1,449	0.033	N/A	N/A
M5	PEM1	38.1448, -122.2155	4,806	0.110	N/A	N/A
M6a	PEM1	38.1444, -122.2152	723	0.017	N/A	N/A
M6b	PEM1	38.1444, -122.2152	611	0.014	N/A	N/A
M7	PEM1	38.1409, 122.2154	41,059	0.943	N/A	N/A
M8	PEM1	38.1404, -122.2151	10,603	0.243	N/A	N/A
M9	PEM1	38.1404, -122.2151	70,279	1.613	N/A	N/A
M10	PEM1	38.1388, -122.2150	1,184	0.027	N/A	N/A
M11	PEM1	38.1383, -122.2147	3,545	0.081	N/A	N/A
		Riverine Marsh Subtotal	*146,297*	*3.358*	*N/A*	*N/A*
Rip1	PSS1	38.1396, -122.2110	1,765	0.041	N/A	N/A
Rip2	PSS1	38.1379, -122.2157	16,001	0.367	N/A	N/A
		Riparian Scrub Subtotal	*17,766*	*0.408*	*N/A*	*N/A*
		Total Wetlands	**164,064**	**3.766**	**N/A**	**N/A**

Channels

Ephemeral channels collect water from upland swales and sheet runoff. These channels are segmented by marshes where gradients transition from steep to shallow. There are 5 channel segments (Ch1, Ch2, Ch3, Ch4, Ch5) with widths ranging from 2 to 10 feet. The five channels total 767 linear feet in length and 0.141 acres in area. Channels were differentiated by upland swales by the following channel indicators: destruction of vegetation, shelving, bank erosion, litter/debris packing, and exposed bedrock.

Wetlands

Twelve riverine marshes are present (M1, M2, M3, M4, M5, M6a, M6b, M7, M8, M9, M10, M11) that total 3.358 acres. Boundaries were determined by the transition from hydrophytes (primarily rushes) to upland grasses and from high clay soils to lower clay soils. Ponded water and emergent vegetation, such as cattails, were present in larger wetlands.

Two areas of riparian scrub (Rip1 and Rip2) occurred adjacent to channels and totaled 0.408 acres. The vegetation communities consisted of willow thickets and blackberry brambles. Soils were saturated and high in clay (and thus hydric).

No vernal pools or other isolated wetlands were detected within the Study Area.

Upland Features not Expected to be Subject to Federal Regulation

The upland swales that were delineated are understood not to be jurisdictional (see **Figure 7**). Hydrophytes were not the dominant vegetation. They all fail the Scalia Test for relatively permanent flow. They all fall under the category described by USEPA & USACE (2008) as:

> "*Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) are generally not waters of the United States because they are not tributaries or they do not have a significant nexus to downstream traditional navigable waters. In addition, ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water are generally not waters of the United States because they are not tributaries or they do not have a significant nexus to downstream traditional navigable waters*."

Water Resources Potentially Subject to State Jurisdiction

All identified hydrologic features were subjected to the 3-parameter test, the broad definition of waters of the State as currently enforced by SWRCB, and the "stream zone" as currently enforced by CDFW. Based upon these criteria, the same features that were potentially subject to federal jurisdiction were determined to be potentially subject to State jurisdiction: channel segments Ch1, Ch2, Ch3, Ch4, and Ch5; riverine marshes M1, M2, M3, M4, M5, M6a, M6b, M7, M8, M9, M10, and M11; and riparian scrub Rip1 and Rip2 (see **Table 2** and **Figure 7**).

Note also that the two riparian scrub features meet the criteria of the "stream zone" as regulated by CDFW.

Upland Features Not Expected To Be Subject to State Regulation

The upland swales that were delineated are understood not to be jurisdictional (see **Figure 7**). Hydrophytes were not the dominant vegetation and channel indicators were not present.

The Study area is not located within a Coastal Zone.

Section 5 | References

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Section 6 | Qualifications of Preparers

G.O. Graening, Ph.D., M.S.E.

G.O. Graening holds a Doctorate in Biological Sciences and a Master of Science in Biological Engineering. Dr. Graening has 30 years of experience in biological assessment and research, including the performance of numerous wetland delineations and aquatic restoration projects. Dr. Graening also served as an adjunct professor of biology at California State University Sacramento for 10 years and was an active researcher in the area of conservation biology and groundwater ecology.

Attachment A

Data Sheets

DATA FORM - ROUTINE WETLAND DETERMINATION

Project ID: Scotts Valley Tribe Gaming
Client:
Investigator: Dr. Geo Graening
Do normal circumstances exist on the site? Yes
Is it an atypical situation? no
Is the area a potential problem area? no

Date: May 4, 2024
State: CA
County: Solano
Township, Range, Section:
Plant Community:
Sample Plot: wetland

VEGETATION

Tree stratum	% Cover	Dominant?	Indicator status
n/a			

Shrub stratum	% Cover	Dominant?	Indicator status
Rumex	<5	N	FACW

Hebaceous stratum	% Cover	Dominant?	Indicator status
Juncus bufonius	80	Y.	OBL
Eleocharis	10		OBL

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): 1 of 1 = 100 %

Comments: hydrophytes dominant

HYDROLOGY

Depth of surface water: 0-1"
Depth to free water in pit: 0-1"
Depth to saturated soil: 0

Primary Indicators:	
✓	Inundated
✓	Saturated in upper 12 in.
	Water marks
	Drift lines
	Sediment deposits
✓	Drainage patterns in wetlands

Secondary Indicators:	
	Oxidized rhizosphere in upper 12 in.
✓	Water-stained leaves
	Local soil survey data
	FAC neutral test
	Other

Comments:

SOILS

Mapped Soil Unit: Clear Lake Clay Series
Taxonomy:
Matches Profile? Yes
Drainage Class:

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-2	n/a	n/a	n/a	organics, plants
2-18	GLEY1 5G/1	n/a	n/a	loamy clay

	Histol	✓	Reducing conditions (test)	✓	Gleyed
	Histic epipedon	✓	High organic content surface layer		Organic streaking
	Sulfidic odor		Redox concentrations (w/in 10")		Organic pan
✓	Probable aquic moisture regime		Concretions (w/in 3", >2mm)	✓	On hydric soils list

Comments: hydric soils

WETLAND DETERMINATION

Hydrophytic Vegetation? ✓
Hydric Soils? ✓
Wetland Hydrology? ✓

Is this sample plot within a wetland? Yes

Comments:

Photo of test pit showing upland soils (sandy loam, oxidized, not saturated)

Photo of test pit showing wetland soils (clay, reduced, saturated, ponded)

DATA FORM - ROUTINE WETLAND DETERMINATION

Project ID: Scotts Valley Tribe Gaming
Client:
Investigator: Dr. Geo Graening
Do normal circumstances exist on the site? Yes
Is it an atypical situation? no
Is the area a potential problem area? no

Date: May 4, 2024
State: CA
County: Solano
Township, Range, Section:
Plant Community:
Sample Plot: Upland

VEGETATION

Tree stratum	% Cover	Dominant?	Indicator status
n/a			

Shrub stratum	% Cover	Dominant?	Indicator status
Vicia			
Trifolium			
Carduus			

Hebaceous stratum	% Cover	Dominant?	Indicator status
Bromus	40	Y	UPL
Hordeum	40	Y	FAC-

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): 0 of 2 = 0 %

Comments:

HYDROLOGY

Depth of surface water: n/a
Depth to free water in pit: >18"
Depth to saturated soil: ≈18"

Primary Indicators:	
	Inundated
	Saturated in upper 12 in.
	Water marks
	Drift lines
	Sediment deposits
	Drainage patterns in wetlands

Secondary Indicators:	
	Oxidized rhizosphere in upper 12 in.
	Water-stained leaves
	Local soil survey data
	FAC neutral test
	Other

Comments: no hydro indicators

SOILS

Mapped Soil Unit: Dibble-Los Osos Clay loam
Taxonomy:
Matches Profile?
Drainage Class:

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-3	2.5Y 4/3	n/a	n/a	Sandy loam
3-18	2.5Y 4/3	n/a	n/a	clayey loam

___ Histol
___ Histic epipedon
___ Sulfidic odor
___ Probable aquic moisture regime

___ Reducing conditions (test)
___ High organic content surface layer
___ Redox concentrations (w/in 10")
___ Concretions (w/in 3", >2mm)

___ Gleyed
___ Organic streaking
___ Organic pan
___ On hydric soils list

Comments: no hydric indicators

WETLAND DETERMINATION

Hydrophytic Vegetation? no
Hydric Soils? no
Wetland Hydrology? no

Is this sample plot within a wetland? No

Comments:

Attachment B

List of Plants Detected

Plants Observed During the April 3 and 7, 2024 Field Surveys and Animals Observed during the April 3 and 7, 2024 and Prior Field Surveys

Common Name	Scientific Name
Silver hairgrass	*Aira caryophyllea*
Crinkled onion	*Allium crispum*
Common fiddleneck	*Amsinckia intermedia*
Slender wild oat	*Avena barbata*
Coyote brush	*Baccharis pilularis*
Mustard	*Brassica sp.*
Quaking grass	*Briza minor*
Brodiaea	*Brodiaea sp.*
Ripgut brome	*Bromus diandrus*
Soft chess	*Bromus hordeaceus*
Red brome	*Bromus rubens*
Red maids	*Calandrinia ciliata*
Shepherd’s purse	*Capsella bursa-pastoris*
Italian thistle	*Carduus pycnocephalus*
Slender flowered thistle	*Carduus tenuiflorus*
Valley tassels	*Castilleja attenuata*
Purple owl’s clover	*Castilleja exserta*
Purple star thistle	*Centaurea calcitrapa*
Yellow star thistle	*Centaurea solstitialis*
Sticky mouse-eared chickweed	*Cerastium glomeratum*
Wavy leaf soap plant	*Chlorogalum pomeridianum*
Bull thistle	*Cirsium vulgare*
Clarkia	*Clarkia sp.*
Miner’s lettuce	*Claytonia perfoliata*
Field bindweed	*Convolvulus arvensis*
Pygmy weed	*Crassula tillaea*
Cardoon	*Cynaria cardunculus*
Bush monkeyflower	*Diplacus aurantiacus*
Stinkwort	*Dittrichia graveolens*
Canyon dudleya	*Dudleya cymosa*
Spikerush	*Eleocharis sp.*
Tall willowherb	*Epilobium brachycarpum*
Naked buckwheat	*Eriogonum nudum*
Broad leaved filaree	*Erodium botrys*
Red-stemmed filaree	*Erodium cicutarium*
White stem filaree	*Erodium moschatum*
Coyote thistle	*Eryngium sp.*
Yellow monkeyflower	*Erythranthe guttata*
California fawn lily	*Erythronium californicum*
Petty spurge	*Euphorbia peplus*
Pacific fescue	*Festuca microstachys*
Rattail sixweeks grass	*Festuca myuros*

Common Name	Scientific Name
Italian ryegrass	*Festuca perennis*
Fennel	*Foeniculum vulgare*
California coffeeberry	*Frangula californica*
Bedstraw	*Galium aparine*
Wall bedstraw	*Galium parisiense*
Cutleaf geranium	*Geranium dissectum*
Bird's eye gilia	*Gilia tricolor*
Waxy mannagrass	*Glyceria declinata*
Few flowered evax	*Hesperevax sparsifolia var sparsiflora*
Shortpod mustard	*Hirschfeldia incana*
Meadow barley	*Hordeum brachyantherum*
Mediterranean barley	*Hordeum marinum ssp. gussoneanum*
Wall barley	*Hordeum murinum*
Smooth cat's-ear	*Hypochaeris glabra*
Rough cat's-ear	*Hypochaeris radiata*
Baltic rush	*Juncus balticus*
Toad rush	*Juncus bufonius*
Iris-leaved rush	*Juncus xiphioides*
California goldfields	*Lasthenia californica*
Hawkbit	*Leontodon saxatilis*
Field pepperweed	*Lepidium campestre*
Shining peppergrass	*Lepidium nitidum*
Jepson's leptosiphon	*Leptosiphon jepsonii*
California cottonrose	*Logfia filaginoides*
Lomatium	*Lomatium sp.*
Scarlet pimpernel	*Lysimachia arvensis*
Hyssop loosestrife	*Lythrum hyssopifolia*
California man-root	*Marah fabacea*
California burclover	*Medicago polymorpha*
California melic grass	*Melica californica*
Silverpuffs	*Microseris sp.*
Watercress	*Nasturtium officinale*
Bermuda buttercup	*Oxalis pes-caprae*
Goldback fern	*Pentagramma triangularis*
Yampah	*Perideridia sp.*
Common phacelia	*Phacelia distans*
Imbricate phacelia	*Phacelia imbricata*
Phacelia	*Phacelia sp.*
Dwarf plantain	*Plantago erecta*
English plantain	*Plantago lanceolata*
One-sided bluegrass	*Poa secunda*
Bluegrass	*Poa sp.*
Licorice fern	*Polypodium sp.*
Fairy mist	*Pterostegia drymarioides*
Coast live oak	*Quercus agrifolia*

Common Name	Scientific Name
California buttercup	*Ranunculus californicus*
White water buttercup	*Ranunculus lobbii*
Prickleseed buttercup	*Ranunculus muricatus*
Western buttercup	*Ranunculus occidentalis*
Black locust	*Robinia pseudoacacia*
Himalayan blackberry	*Rubus armeniacus*
Curly dock	*Rumex crispus*
Fiddleleaf dock	*Rumex pulcher*
Arroyo willow	*Salix lasiolepis*
Blue elderberry	*Sambucus nigra ssp. caerulea*
Poison sanicle	*Sanicula bipinnata*
Purple sanicle	*Sanicula bipinnatifida*
California bee plant	*Scrophularia californica*
Old man of spring	*Senecio vulgare*
Windmill pinks	*Silene gallica*
Milk thistle	*Silybum marianum*
Blue-eyed grass	*Sisyrinchium bellum*
White nightshade	*Solanum americanum*
South American soliva	*Soliva sessilis*
Sow thistle	*Sonchus oleraceus*
White hedge nettle	*Stachys albens*
Hedge nettle	*Stachys pycnantha*
Purple needlegrass	*Stipa pulchra*
Tall sock-destroyer	*Torilis arvensis*
Poison-oak	*Toxicodendron diversilobum*
Hop clover	*Trifolium dubium*
Rose clover	*Trifolium hirtum*
Thimble clover	*Trifolium microdon*
Subterranean clover	*Trifolium subterraneum*
White tipped clover	*Trifolium variegatum*
Triplet lily	*Triteleia sp.*
California bay	*Umbellularia californica*
Spring vetch	*Vicia sativa*
Winter vetch	*Vicia villosa*
California golden violet	*Viola pedunculata*
Narrow leaf mule ears	*Wyethia angustifolia*

Attachment C

Site Photographs

View looking south of southeastern corner of Study Area and entrance gate.

View looking north along western boundary of Study Area with willow scrub and emergent marsh

View looking west of a graded commercial pad with an erosion gully in a pasture setting

View looking southeast in the middle edge of the Study Area at degraded marsh and horses grazing on neighboring property

View looking northwest in the middle of the Study Area of marsh and electrical transmission lines, with the roadbed of Interstate 80 in the background and a channel and riparian habitat at the base.

Closeup view of the riparian vegetation (primarily arroyo willow)

View looking north of the primary drainage system, which is a series of intermittent channels and wetland pools

View looking south from the northern portion of the Study Area showing the metamorphic rock outcrop and steep slopes

View looking southwest from the northern portion of the Action Area showing the metamorphic rock outcrop and steep slopes and annual grassland

View looking south of pasture and rolling hills and drainage systems in the valleys, with I-80 on the right.

View looking north at the area proposed for tribal housing.

Appendix H-3

Botanical Report

BOTANICAL REPORT

Scotts Valley 160-acre Fee-to-Trust Project

June 2024

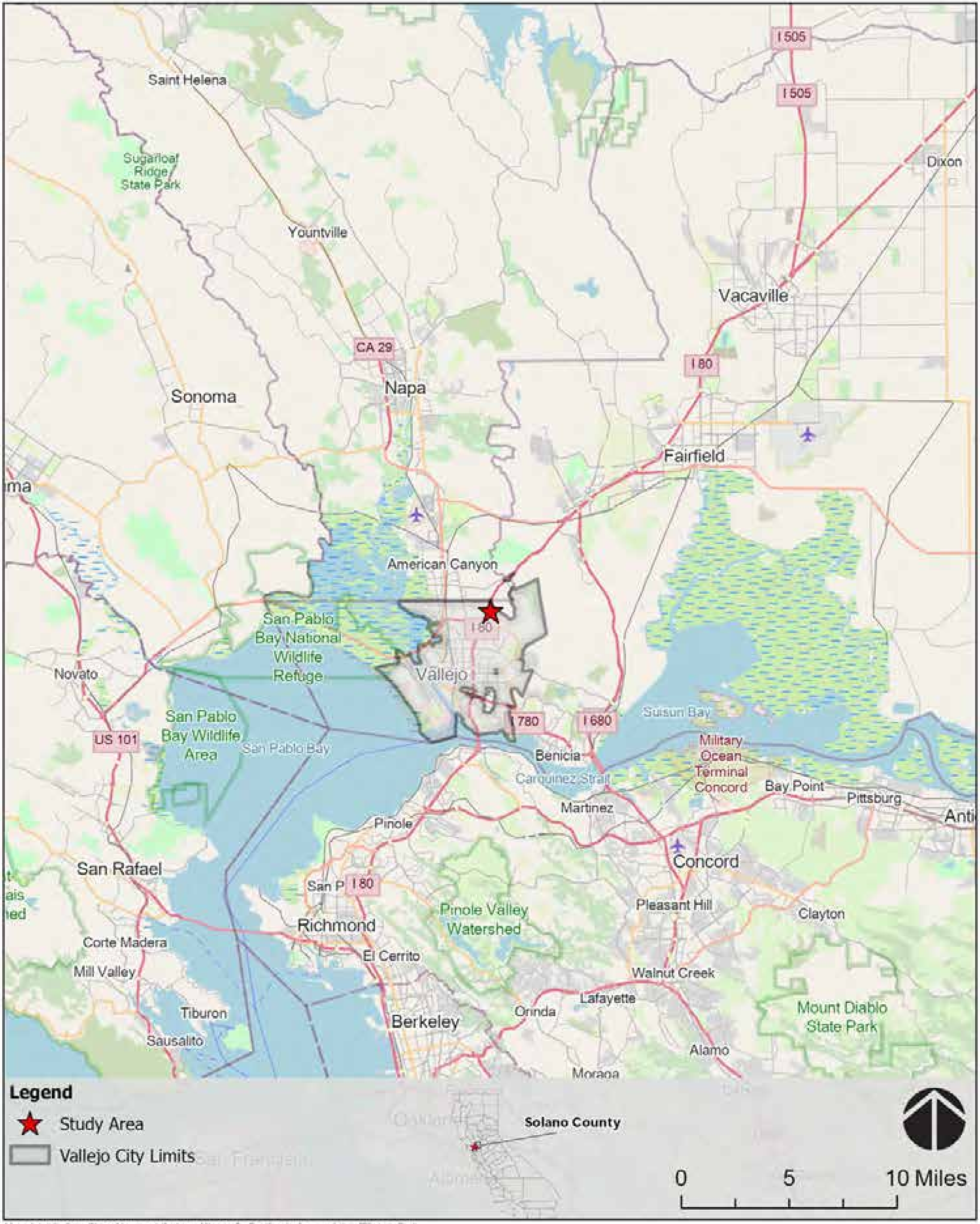
Table of Contents

List of Figures

List of Attachments

Section 1 | Description and Location of the Study Area

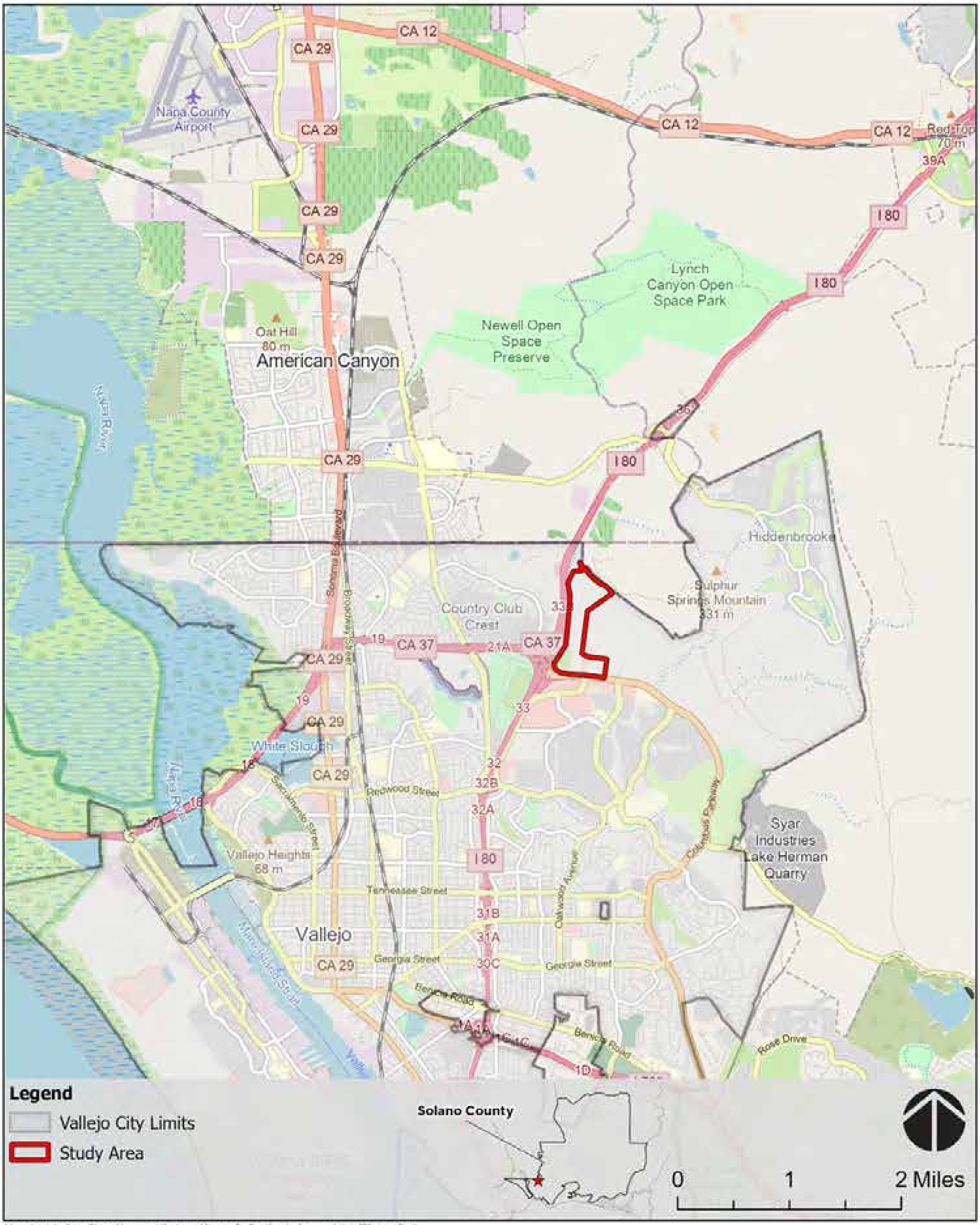
Figure 1 and **Figure 2** show the location of the Study Area, and **Figure 3** presents an aerial photograph of the Study Area and the immediate vicinity. The Study Area is located at the northeast corner of the intersection of Interstate 80 (I-80) and Columbus Parkway in Vallejo, California, Section 5, Township 3 North, Range 3 West, and Section 32, Township 4 North, Range 3 West, Mount Diablo Base and Meridian within the Cordelia 7.5-minute U.S. Geological Survey (USGS) quadrangle. The Study Area consists of four parcels totaling 160 acres: Assessor's Parcel Numbers (APNs) 182-010-010, 0182-020-010, 0182-020-020, and 0182-020-080).



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

FIGURE 1

REGIONAL LOCATION



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

FIGURE 2
SITE AND VICINITY

Esri Community Maps Contributors, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census

FIGURE 3
AERIAL OVERVIEW

Section 2 | Biological Setting

The Study Area is located within the Central Coast geographic subregion, which is contained within the Central Western California region of the larger California Floristic Province (Baldwin et al. 2012).

The Study Area falls within Climate Zone 17 "Marine effects in Southern Oregon, Northern, and Central California." Climate Zone 17 experiences a mild climate with cool, wet winters and cool summers with frequent fog and wind. Temperatures in this zone do not fall below 20 degrees Fahrenheit with an average high of 97 degrees Fahrenheit (Sunset, 2024).

The topography of the Study Area ranges from flat in the southern portion of the Study Area, to steep in the northern portion. Elevations on the site range from 140 feet in the southern portion of the site to approximately 830 feet on the northern portion. The Study Area is currently undeveloped open space, transmission power corridor, and pasture and equine facilities. Habitats are shown in **Figure 4**. Surrounding development includes commercial development to the south, rangeland to the north and east, and highways, a large vista rest stop, and residential developments to the west.

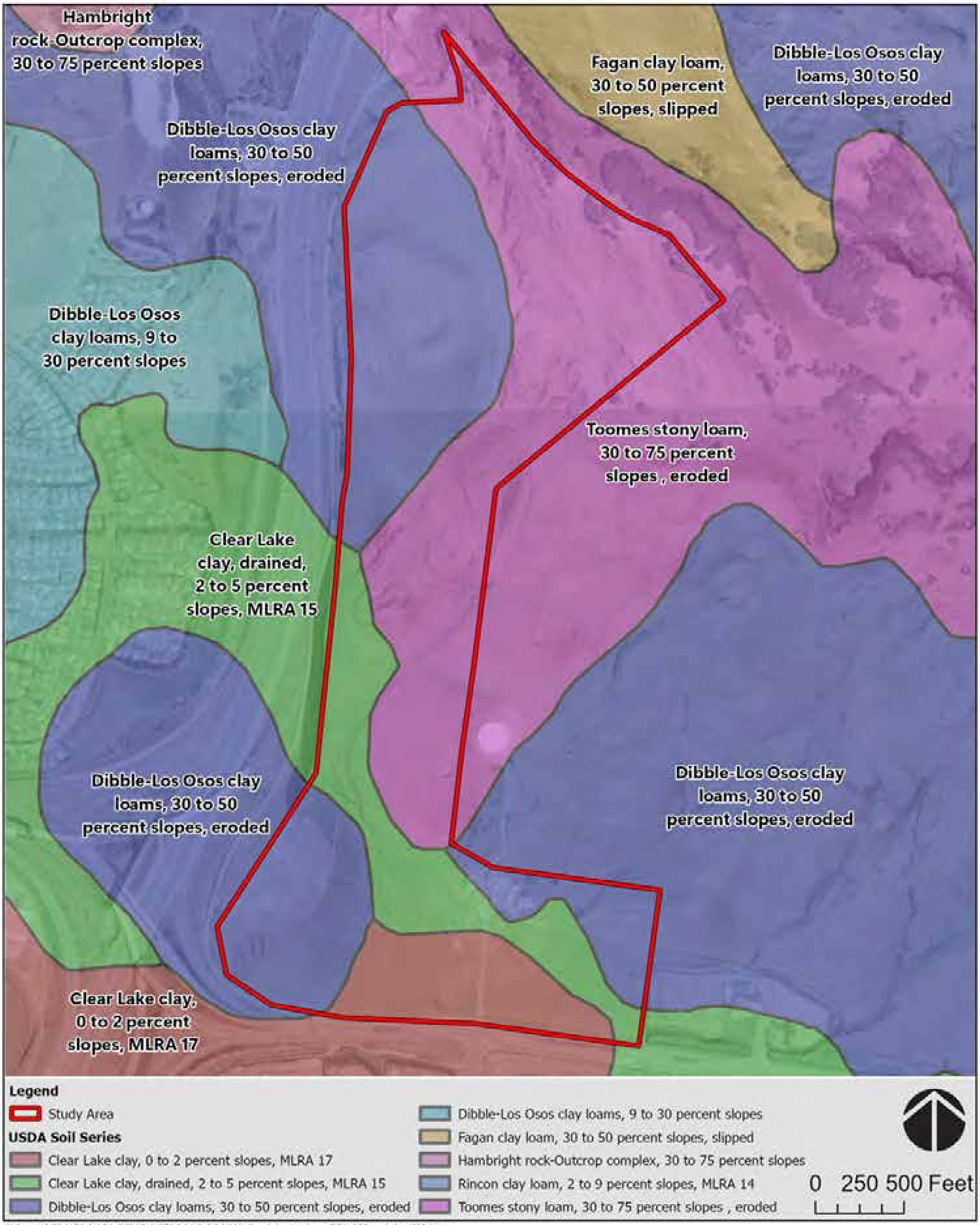
Drainage collects in swales and ephemeral channels that run in a southerly direction, and eventually combine into a single channel that flows into a double-pipe culvert. This culvert directs stormwater under Auto Mall Parkway and into Rindler Creek, which is tributary to Lake Chabot. Annual precipitation averages approximately 21 inches (Climate Data, 2024).

USDA NRCS mapped soil units occurring within the Study Area are as follows (and mapped in **Figure 5**):

- Dibble-Los Osos clay loam series (30-50% slope, eroded), not hydric
- Clear Lake clay series (2-5% slope), hydric
- Toomes stony loam series (30-75% slope, eroded)

Source: Esri, USDA FSA, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User

FIGURE 4
HABITAT TYPES



Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community, Yolo County, Maxar

FIGURE 5

USDA SOIL SERIES

Section 3 | Survey Methodology

Survey methodology followed the following protocols:

- California Department of Fish and Wildlife (CDFW). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.
- U.S. Fish and Wildlife Service (USFWS). 1996. Guidelines for conducting and reporting botanical inventories for federally listed, proposed and candidate plants. Sacramento Fish and Wildlife Office, Sacramento, California. 2 pp.
- California Native Plant Society. 2001. CNPS botanical survey guidelines.

3.1 PRELIMINARY DATA GATHERING AND RESEARCH

Prior to conducting the field survey, the following information sources were reviewed:

- Aerial photography of the Study Area (current and historical)
- USGS 7.5 degree-minute topographic quadrangles
- USFWS National Wetland Inventory
- USDA Natural Resources Conservation Service soil survey maps
- California Natural Diversity Database (CNDDB), electronically updated monthly by subscription
- California Native Plant Society's database *Inventory of Rare and Endangered Plants of California* (online edition).

No reference sites were deemed necessary to visit.

3.2 FIELD SURVEYS

Dates of botanical field surveys (indicating the botanical field surveyor(s) that surveyed each area on each survey date), and total person-hours spent:

- Dr. G.O. Graening, April 3 and May 4, 2024, full days
- Tim Nosal, MS., April 7 and June 1, 2024, full days

The qualifications of the botanical field surveyors and report authors are summarized at the end of this report.

A variable-intensity pedestrian survey of the Study Area was performed, and modified to account for differences in terrain, vegetation density, and visibility. All visible taxa observed were recorded in a field notebook. Survey efforts emphasized the search for any special-status species that had documented occurrences in the CNDDB within the vicinity of the Study Area and those species on the CNPS or USFWS species lists.

Taxa were identified to the taxonomic level necessary to determine whether or not they are a special-status plant. When a specimen could not be identified in the field, a photograph was taken and/or a specimen was pressed and identified in the laboratory using a dissecting scope where necessary. Dr. Graening holds the following scientific collection permits: CDFW Scientific Collecting Permit No. SC-

006802; and CDFW Plant Voucher Specimen Permit 09004. Tim Nosal holds CDFW Plant Voucher Specimen Permit 2081(a)-16-102-V. Taxonomic determinations were facilitated by referencing museum specimens or by various texts, including the following: Powell and Hogue (1979); Pavlik (1991); (1993); Brenzel (2012); Stuart and Sawyer (2001); Lanner (2002); Sibley (2003); Baldwin et al. (2012); Calflora (2022); CDFW (2022b, c); NatureServe 2022; and University of California at Berkeley (2022a,b).

3.3 MAPPING AND OTHER ANALYSIS

The locations of any special-status species or vegetation communities sighted were marked on aerial photographs and/or georeferenced with a geographic positioning system (GPS) receiver. Vegetation community types occurring in the Study Area were mapped on aerial photographs, and information on habitat conditions and the suitability of the habitats to support special-status species was also recorded.

Locations of any species' occurrences and sensitive natural community boundaries detected within the Study Area were digitized to produce the final maps. Geographic analyses were performed using geographical information system software (ArcGIS 11, ESRI, Inc.). Vegetation communities (assemblages of plant species growing in an area of similar biological and environmental factors) were classified by Vegetation Series (distinctive associations of plants, described by dominant species and particular environmental setting) using the CNPS Vegetation Classification system (Sawyer and Keeler-Wolf, 1995). Species' habitat requirements and life histories were identified using the following sources: Baldwin et al. (2012); CNPS (2022), Calflora (2022); CDFW (2022a, b, c); and University of California at Berkeley (2022a, b).

3.4 PREVIOUS STUDIES

Field surveys were previously conducted on the 128.2 acre-property identified by APN 182-010-010 on the following dates: October 2005, and on November 8, 2005; May 17 and 23, 2006; July 5, 2006; January 31, 2007; February 10, 2007; March 28, 2007; April 4 and 11, 2007; July 10, 2007; December 17, 2015; September 7, 2022; and June 27, 2023 (Huffman Broadway Group 2005 and 2006; Jennings 2008; AES 2016; Montrose Environmental Solutions, 2022 and 2023). Some of these were protocol botanical surveys. No special-status plants were detected.

Protocol botanical field surveys were previously conducted within the 32.5-acre property identified by APNs 0182-020-010, -020, and -080 on the following dates: November 15, 2019; April 22, May 22, and August 11, 2020 (Monk & Associates, Inc. 2022). No special-status plants were detected.

3.5 LIST OF SENSITIVE NATURAL COMMUNITIES WITH POTENTIAL TO OCCUR IN THE REGION

No critical habitat for any federally-listed plant species occurs within the Study Area.

The CNDDB reported no special-status habitats within the Study Area, but the CNDDB did report the following special-status habitats within the vicinity (10-mile buffer): Coastal Brackish Marsh; Northern Claypan Vernal Pool; Northern Coastal Salt Marsh; Northern Vernal Pool; Serpentine Bunchgrass

3.6 LIST OF SPECIAL-STATUS PLANTS WITH POTENTIAL TO OCCUR IN THE REGION

A list of special-status plant species with potential to occur in the region was compiled based upon the following:

- A spatial query of the CNDDB using a 10-mile buffer around the Study Area.
- A 9-quadrangle query of the California Native Plant Society's database *Inventory of Rare and Endangered Plants of California* (online edition).
- Official USFWS species list generated online using the USFWS IPaC Trust Resource Report System (USFWS, 2024).

The databases were queried and any reported occurrences of any special-status plant species were plotted in relation to the Study Area boundary using GIS software. The CNDDB reported no special-status plant species occurrences within the Study Area. Within a 10-mile buffer of the Study Area, the CNDDB reported numerous special-status species occurrences, summarized in **Attachment A**.

Section 4 | Results

4.1 List of Plant Taxa Detected During Field Survey(S)

All plant taxa detected during the botanical field survey are listed in the **Attachment B**. Photos of the Study Area are provided in **Attachment C**. During the field survey, one rare plant species was detected within the Study Area: Jepson's leptosiphon (*Leptosiphon jepsonii*), which is ranked by CNPS as CRPR 1B.2 (**Figure 6**).

Deposition locations of voucher specimens: none collected.

4.2 List of Vegetation Communities Detected During Field Surveys

Terrestrial habitats that occur within the Study Area consist of riparian scrub, freshwater marsh, pasture, and annual grassland/rock outcrop. Ruderal/developed areas are also present. Ephemeral channels are mapped within several of these habitats. These habitats are shown on **Figure 6** and discussed further below. Representative site photographs are provided in **Attachment C**.

Riparian Scrub

This community is found on the western edge of the Study Area; it is associated with an intermittent drainage that is fed by both the flank of Sulphur Springs Mountain as well as road runoff from I-80. The vegetation is dominated by arroyo willow (*Salix lasiolepis*) with an understory of Himalayan blackberry (*Rubus discolor*) and poison oak (*Toxicodendron diversilobum*), and limited areas of broad-leaved cattail (*Typha latifolia*). Vegetation along the edge of the riparian habitat included sweet fennel (*Foeniculum vulgare*) and coyote brush (*Baccharis pilularis*). The riparian habitat transitions to either marsh or pasture, depending upon the local topography.

Freshwater Marsh

Freshwater marsh habitat was observed in the valleys of hills. The dominant plants in these areas are rushes (e.g. *Juncus bufonius*) and spikerushes (*Eleocharis*). Facultative grasses and forbs are also present, such as perennial ryegrass (*Lolium perenne*), Bermuda grass (*Cynodon dactylon*), curly dock (*Rumex crispus*), common monkeyflower (*Mimulus guttattus*), and pennyroyal (*Mentha* sp.). Ponded areas contain floating plants such as watercress (*Nasturtium officinale*). The water quality of these marshes has been impacted by cattle and horses, which are allowed to wallow and graze in the wetlands.

Esri Community Maps Contributors, County of Solano, California State Parks, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of

FIGURE 6
RARE PLANT LOCATIONS

Pasture

The majority of the Study Area is a simplified non-native grassland containing perennial ryegrass (*Lolium perenne*), wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), and other pasture grasses. These areas are subject to significant grazing pressure and may have been plowed or conditioned previously. Non-native forbs are abundant, such as thistles (*Silybum*, *Carduus*), filarees (*Erodium*), star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echioides*), poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), and spiny cocklebur (*Xanthium spinosum*). Large patches of artichoke thistle (*Cynara cardunculus*) were also observed within this habitat.

Annual Grassland/Rock Outcrop

This non-native annual grassland community is similar to the pasture community described above, but contains a greater diversity of species and greater number of native species. This is due in part to the rocky terrain, which is more difficult for cattle to graze, and because the metamorphic soils and rock outcrops provide additional habitat niches. Native wildflowers were abundant, such as California poppy (*Eschscholzia californica*), golden violet (*Viola pedunculata*), owl's clover (*Castilleja*), and blue dicks (*Dichelostemma capitatum*). Seeps were common at the base of rock outcrops, and these wet areas created microhabitats for specialized plants, such as ferns and succulents (*Dudleya* spp.).

Oak Woodland

A narrow strip of oak woodland occurs along the northern boundary of the Study Area along a hilltop crest. This habitat contains a significant canopy cover of coast live oak (*Quercus agrifolia*). Ground cover vegetation is similar to species observed within the annual grassland/rock outcrop habitat.

Ruderal/Developed

Ruderal/developed habitats are those areas that are highly modified from their natural state and are subject to intensive land management, paving, or similar. Within the Study Area, ruderal developed areas included an unpaved access drive and informal parking areas, fencing, and horse shelters. Vegetation was sparse to absent in this area. Where vegetation did occur, it was dominated primarily by non-native grasses and invasive forbs.

4.3 ADEQUACY OF BOTANICAL FIELD SURVEYS

Potential for a false negative botanical field survey:

> A false negative is very unlikely since multiple surveys were performed over the span of the floristic window (early and late season) over several years, and by more than one botanist.

Did climatic conditions affect the botanical field survey results?

> There were no unusual climatic conditions. Some survey years were wetter, and some were dryer, and the surveys covered different seasons.

Did the timing of botanical field surveys affect the comprehensiveness of botanical field surveys?

> Since the timing of surveys covered the entire floristic season, the surveys were completely comprehensive.

No further botanical field surveys are deemed necessary.

Section 5 | Qualifications of Surveyors and Authors

G.O. GRAENING, Ph.D., M.S.E.

Dr. Graening holds a PhD in Biological Sciences and a Master of Science in Biological and Agricultural Engineering. Dr. Graening is an adjunct Professor at California State University at Sacramento, and is an active researcher in the area of conservation biology; his publication list is available online at http://www.csus.edu/indiv/g/graeningg/pubs.htm. Dr. Graening is also a Certified Arborist (ISA # WE-6725A). Dr. Graening has 26 years of experience in environmental assessment, including previous employment (prior to joining Acorn Environmental) with The Nature Conservancy, Tetra Tech Inc., CH2M Hill, Inc., and Natural Investigations Company.

TIMOTHY R. D. NOSAL, M.S.

Mr. Nosal holds a B.S. and M.S. in Biological Sciences. Mr. Nosal has statewide experience performing sensitive plant and animal surveys in addition to terrestrial vegetation investigations. Mr. Nosal has over 25 years of experience in botanical surveys, environmental assessment, and teaching with employers that include California Department of Fish and Wildlife, State Water Resources Control Board, American River College, MTI College and Pacific Municipal Consultants. Mr. Nosal has intensive experience with the flora of the Pine Hill region, including leading numerous field trips exploring the botany of the region, co-authoring a fuel management plan for Pine Hill, and a Master's thesis on Stebbins's morning glory (*Calystegia stebbinsii*), an endangered plant of the region.

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Attachment A

Special-Status Plant Table

Special-Status Plant Species with Potential to Occur in the Vicinity of the Study Area

Common Name ***Scientific Name***	Status	Habitat*	Potential to Occur
Franciscan onion *Allium peninsulare var. Franciscanum*	1B.2	Cismontane woodland, valley and foothill grassland. Clay soils; often on serpentine. Dry hillsides. 100-300 m.	Yes. Potential habitat present in Study Area where grassland and oak woodland habitats occur.
Alkali milk-vetch *Astragalus tener var. Tener*	1B.2	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 1-170m.	No. No suitable habitat present.
Vernal pool smallscale *Atriplex persistens*	1B.2	Alkaline vernal pools. 10-115 m.	No. No suitable habitat present.
Big-scale balsamroot *Balsamorhiza macrolepis*	1B.2	Valley and foothill grassland, cismontane woodland. Sometimes on serpentine. 35-1,000 m.	Yes. Potential habitat present in Study Area where grassland and oak woodland habitats occur.
Big tarplant *Blepharizonia plumosa*	1B.1	Valley and foothill grassland. Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas. 15-455 m.	Yes. Potential habitat present in Study Area where grassland habitats occur.
Narrow-anthered brodiaea *Brodiaea leptandra*	1B.2	Broadleafed upland forest, chaparral, lower montane coniferous forest. 110-915 m.	Yes. Potential habitat present in Study Area where oak woodland habitats occur.
Mt. Diablo fairy-lantern *Calochortus pulchellus*	1B.2	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland. On wooded and brushy slopes. 200-800 m.	Yes. Potential habitat present in Study Area where grassland and oak woodland habitats occur.
Lyngbye's sedge *Carex lyngbyei*	2B.2	Marshes and swamps (brackish or freshwater). 0 m.	Yes. Potential habitat present in Study Area where marshes occur.
Tiburon paintbrush *Castilleja affinis*	1B.2, CT, FE	Valley grassland, serpentine soils.	No. Suitable soils absent.
Holly-leaved ceanothus *Ceanothus purpureus*	1B.2	Chaparral. Rocky, volcanic slopes. 120-640m.	No. No suitable habitat present.
Congdon's tarplant *Centromadia parryi ssp. congdonii*	1B.1	Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay. 1-230 m.	Yes. Potential habitat present where grassland and clay soils occur.
Pappose tarplant *Centromadia parryi ssp. parryi*	1B.2	Coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland. Vernally mesic, often alkaline sites. 2-420 m.	No. No suitable habitat present.

Bolander's water-hemlock *Cicuta maculata var. bolanderi*	2B.1	Marshes, fresh or brackish water. 0-200 m.	Yes. Potential habitat present in Study Area where marshes occur.
Western leatherwood *Dirca occidentalis*	1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, coast coniferous forest, riparian forest, riparian woodland. On brushy slopes, mesic sites; mostly in mixed evergreen and foothill woodland communities. 30-550 m.	Yes. Potential habitat present in Study Area where oak woodland habitats occur.
Dwarf downingia *Downingia pusilla*	2B.2	Valley and foothill grassland (mesic sites), vernal pools. Vernal lake and pool margins with a variety of associates. In several types of vernal pools. 1-485 m.	No. No suitable habitat present.
Greene's narrow-leaved daisy *Erigeron greenei*	1B.2	Chaparral. Serpentine and volcanic substrates, generally in shrubby vegetation. 75-1,060 m.	No. No suitable habitat present.
Mt. Diablo buckwheat *Eriogonum truncatum*	1B.1	Chaparral, coastal scrub, valley and foothill grassland. Dry, exposed clay or sandy substrates. 3-350 m.	Yes. Potential habitat present in Study Area where grassland habitats occur.
Jepson's coyote-thistle *Eryngium jepsonii*	1B.2	Vernal pools.	No. No suitable habitat present.
San Joaquin spearscale *Extriplex joaquinana*	1B.2	Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with *distichlis spicata*, *frankenia*, etc. 1-250 m.	No. No suitable habitat present.
Fragrant fritillary *Fritillaria liliacea*	1B.2	Coastal scrub, valley and foothill grassland, coastal prairie. Often on serpentine; various soils reported though usually clay, in grassland. 3-410 m.	Yes. Potential habitat present in Study Area where grassland habitats occur.
Diablo helianthella *Helianthella castanea*	1B.2	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade. 25-1,150 m.	Yes. Potential habitat present in Study Area where grassland and oak woodland habitats occur.
Bridges' coast range shoulderband *Helminthoglypta nickliniana bridgesi*	CSSC	Inhabits open hillsides of alameda and contra costa counties. Tends to colonize under tall grasses and weeds.	Yes. Potential habitat present in Study Area where grassland habitats occur.
Brewer's western flax *Hesperolinon breweri*	1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Often in rocky serpentine soil in serpentine chaparral and serpentine grassland. 30-885 m.	Yes. Potential habitat present in Study Area where grassland and oak woodland habitats occur.

Carquinez goldenbush *Isocoma arguta*	1B.1	Valley and foothill grassland. Alkaline soils, flats, lower hills. On low benches near drainages and on tops and sides of mounds in swale habitat. 1-20 m.	Yes. Potential habitat present in Study Area where grassland habitats occur.
Delta tule pea *Lathyrus jepsonii var. jepsonii*	1B.2	Freshwater and brackish marshes. Often found with typha, aster lentus, rosa calif., juncus spp., scirpus, etc. Usually on marsh and slough edges.	No. No suitable habitat present.
Legenere *Legenere limosa*	1B.1	Vernal pools. Many historical occurrences are extirpated. In beds of vernal pools. 1-880 m.	No. No suitable habitat present.
Jepson's leptosiphon *Leptosiphon jepsonii*	1B.2	Chaparral, cismontane woodland. Open to partially shaded grassy slopes. On volcanics or the periphery of serpentine substrates. 100-500 m.	Yes. Potential habitat present in Study Area where grassland and oak woodland habitats occur.
Mason's lilaeopsis *Lilaeopsis masonii*	1B.1	Freshwater and brackish marshes, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or riverbank erosion. 0-10 m.	No. No suitable habitat present.
Delta mudwort *Limosella australis*	2B.1	Delta bays and backwaters.	No. No suitable habitat present.
Baker's navarretia *Navarretia leucocephala ssp. bakeri*	1B.1	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales; adobe or alkaline soils. 5-950 m.	No. No suitable habitat present.
California alkali grass *Puccinellia simplex*	1B.2	Alkaline soils.	No. No suitable habitat present.
California beaked-rush *Rhinophoral californica*	1B.1	Bogs and fens, marshes and swamps, lower montane coniferous forest, meadows and seeps. Freshwater seeps and open marshy areas. 45-1,010 m.	Yes. Potential habitat present in Study Area where mash habitats occur.
Chaparral ragwort *Senecio aphanitic*	2B.2	Chaparral, cismontane woodland, coastal scrub. Drying alkaline flats. 15-800 m.	Yes. Potential habitat present in Study Area where oak woodland habitats occur.
Napa checkerbloom *Sidalcea hickmanii ssp. napensis*	1B.1	Chaparral. Rhyolitic substrates. 415-610 m.	No. No suitable habitat present.
Long-styled sand-spurrey *Spergularia macrotheca var. longistyla*	1B.2	Moist coastal and inland habitat, often in alkaline and saline substrates.	No. No suitable habitat present.
Northern slender pondweed *Stuckenia filiformis ssp. alpina*	2B.2	Ponds.	No. No suitable habitat present.

Suisun Marsh aster *Symphyotrichum lentum*	1B.2	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with phragmites, scirpus, blackberry, typha, etc. 0-3 m.	No. No suitable habitat present.
Napa bluecurls *Trichostema ruygtii*	1B.2	Cismontane woodland, chaparral, valley and foothill grassland, vernal pools, lower montane coniferous forest. Often in open, sunny areas. Also has been found in vernal pools. 30-590 m.	Yes. Potential habitat present in Study Area where grassland and oak woodland habitats occur.
Showy Indian Clover *Trifolium amoenum*	1B.1, FE	Generally a wetland species. Valley grassland, wetland-riparian.	Yes. Potential habitat present in marshes and annual grassland/rock outcrop habitats.
Saline clover *Trifolium hydrophilum*	1B.2	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0-300 m.	No. No suitable habitat present.
Oval-leaved viburnum *Viburnum ellipticum*	2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. 215-1,400 m.	Yes. Potential habitat present in Study Area where oak woodland habitats occur.
* Habitat requirements are derived from the CNDDB general and microhabitats unless otherwise noted.			

Attachment B

Plants Observed within the Study Area

Plants Observed During the April 3 and 7, 2024 Field Surveys and Animals Observed during the April 3 and 7, 2024 and Prior Field Surveys

Common Name	Scientific Name
Silver hairgrass	*Aira caryophyllea*
Crinkled onion	*Allium crispum*
Common fiddleneck	*Amsinckia intermedia*
Slender wild oat	*Avena barbata*
Coyote brush	*Baccharis pilularis*
Mustard	*Brassica sp.*
Quaking grass	*Briza minor*
Brodiaea	*Brodiaea sp.*
Ripgut brome	*Bromus diandrus*
Soft chess	*Bromus hordeaceus*
Red brome	*Bromus rubens*
Red maids	*Calandrinia ciliata*
Shepherd’s purse	*Capsella bursa-pastoris*
Italian thistle	*Carduus pycnocephalus*
Slender flowered thistle	*Carduus tenuiflorus*
Valley tassels	*Castilleja attenuata*
Purple owl’s clover	*Castilleja exserta*
Purple star thistle	*Centaurea calcitrapa*
Yellow star thistle	*Centaurea solstitialis*
Sticky mouse-eared chickweed	*Cerastium glomeratum*
Wavy leaf soap plant	*Chlorogalum pomeridianum*
Bull thistle	*Cirsium vulgare*
Clarkia	*Clarkia sp.*
Miner’s lettuce	*Claytonia perfoliata*
Field bindweed	*Convolvulus arvensis*
Pygmy weed	*Crassula tillaea*
Cardoon	*Cynaria cardunculus*
Bush monkeyflower	*Diplacus aurantiacus*
Stinkwort	*Dittrichia graveolens*
Canyon dudleya	*Dudleya cymosa*
Spikerush	*Eleocharis sp.*
Tall willowherb	*Epilobium brachycarpum*
Naked buckwheat	*Eriogonum nudum*
Broad leaved filaree	*Erodium botrys*
Red-stemmed filaree	*Erodium cicutarium*
White stem filaree	*Erodium moschatum*
Coyote thistle	*Eryngium sp.*
Yellow monkeyflower	*Erythranthe guttata*
California fawn lily	*Erythronium californicum*
Petty spurge	*Euphorbia peplus*
Pacific fescue	*Festuca microstachys*
Rattail sixweeks grass	*Festuca myuros*

Common Name	Scientific Name
Italian ryegrass	*Festuca perennis*
Fennel	*Foeniculum vulgare*
California coffeeberry	*Frangula californica*
Bedstraw	*Galium aparine*
Wall bedstraw	*Galium parisiense*
Cutleaf geranium	*Geranium dissectum*
Bird’s eye gilia	*Gilia tricolor*
Waxy mannagrass	*Glyceria declinata*
Few flowered evax	*Hesperevax sparsifolia var sparsiflora*
Shortpod mustard	*Hirschfeldia incana*
Meadow barley	*Hordeum brachyantherum*
Mediterranean barley	*Hordeum marinum ssp. gussoneanum*
Wall barley	*Hordeum murinum*
Smooth cat’s-ear	*Hypochaeris glabra*
Rough cat’s-ear	*Hypochaeris radiata*
Baltic rush	*Juncus balticus*
Toad rush	*Juncus bufonius*
Iris-leaved rush	*Juncus xiphioides*
California goldfields	*Lasthenia californica*
Hawkbit	*Leontodon saxatilis*
Field pepperweed	*Lepidium campestre*
Shining peppergrass	*Lepidium nitidum*
Jepson’s leptosiphon	*Leptosiphon jepsonii*
California cottonrose	*Logfia filaginoides*
Lomatium	*Lomatium sp.*
Scarlet pimpernel	*Lysimachia arvensis*
Hyssop loosestrife	*Lythrum hyssopifolia*
California man-root	*Marah fabacea*
California burclover	*Medicago polymorpha*
California melic grass	*Melica californica*
Silverpuffs	*Microseris sp.*
Watercress	*Nasturtium officinale*
Bermuda buttercup	*Oxalis pes-caprae*
Goldback fern	*Pentagramma triangularis*
Yampah	*Perideridia sp.*
Common phacelia	*Phacelia distans*
Imbricate phacelia	*Phacelia imbricata*
Phacelia	*Phacelia sp.*
Dwarf plantain	*Plantago erecta*
English plantain	*Plantago lanceolata*
One-sided bluegrass	*Poa secunda*
Bluegrass	*Poa sp.*
Licorice fern	*Polypodium sp.*
Fairy mist	*Pterostegia drymarioides*
Coast live oak	*Quercus agrifolia*

Common Name	Scientific Name
California buttercup	*Ranunculus californicus*
White water buttercup	*Ranunculus lobbii*
Prickleseed buttercup	*Ranunculus muricatus*
Western buttercup	*Ranunculus occidentalis*
Black locust	*Robinia pseudoacacia*
Himalayan blackberry	*Rubus armeniacus*
Curly dock	*Rumex crispus*
Fiddleleaf dock	*Rumex pulcher*
Arroyo willow	*Salix lasiolepis*
Blue elderberry	*Sambucus nigra ssp. caerulea*
Poison sanicle	*Sanicula bipinnata*
Purple sanicle	*Sanicula bipinnatifida*
California bee plant	*Scrophularia californica*
Old man of spring	*Senecio vulgare*
Windmill pinks	*Silene gallica*
Milk thistle	*Silybum marianum*
Blue-eyed grass	*Sisyrinchium bellum*
White nightshade	*Solanum americanum*
South American soliva	*Soliva sessilis*
Sow thistle	*Sonchus oleraceus*
White hedge nettle	*Stachys albens*
Hedge nettle	*Stachys pycnantha*
Purple needlegrass	*Stipa pulchra*
Tall sock-destroyer	*Torilis arvensis*
Poison-oak	*Toxicodendron diversilobum*
Hop clover	*Trifolium dubium*
Rose clover	*Trifolium hirtum*
Thimble clover	*Trifolium microdon*
Subterranean clover	*Trifolium subterraneum*
White tipped clover	*Trifolium variegatum*
Triplet lily	*Triteleia sp.*
California bay	*Umbellularia californica*
Spring vetch	*Vicia sativa*
Winter vetch	*Vicia villosa*
California golden violet	*Viola pedunculata*
Narrow leaf mule ears	*Wyethia angustifolia*

Attachment C

Site Photographs

View looking south of southeastern corner of Study Area and entrance gate.

View looking north along western boundary of Study Area with willow scrub and emergent marsh

View looking west of a graded commercial pad with an erosion gully in a pasture setting

View looking southeast in the middle edge of the Study Area at degraded marsh and horses grazing on neighboring property

View looking northwest in the middle of the Study Area of marsh and electrical transmission lines, with the roadbed of Interstate 80 in the background and a channel and riparian habitat at the base.

Closeup view of the riparian vegetation (primarily arroyo willow)

View looking north of the primary drainage system, which is a series of intermittent channels and wetland pools

View looking south from the northern portion of the Study Area showing the metamorphic rock outcrop and steep slopes

View looking southwest from the northern portion of the Study Area showing the metamorphic rock outcrop and steep slopes and annual grassland

View looking south of pasture and rolling hills and drainage systems in the valleys, with I-80 on the right.

View looking north at the central and northern portion of the Study Area.

Appendix H-4

Biological Technical Memorandum

5170 Golden Foothill Parkway
El Dorado Hills, CA 95762
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Biological Technical Memorandum: Scotts Valley 160-Acre Fee-to-Trust Project

July 3, 2024

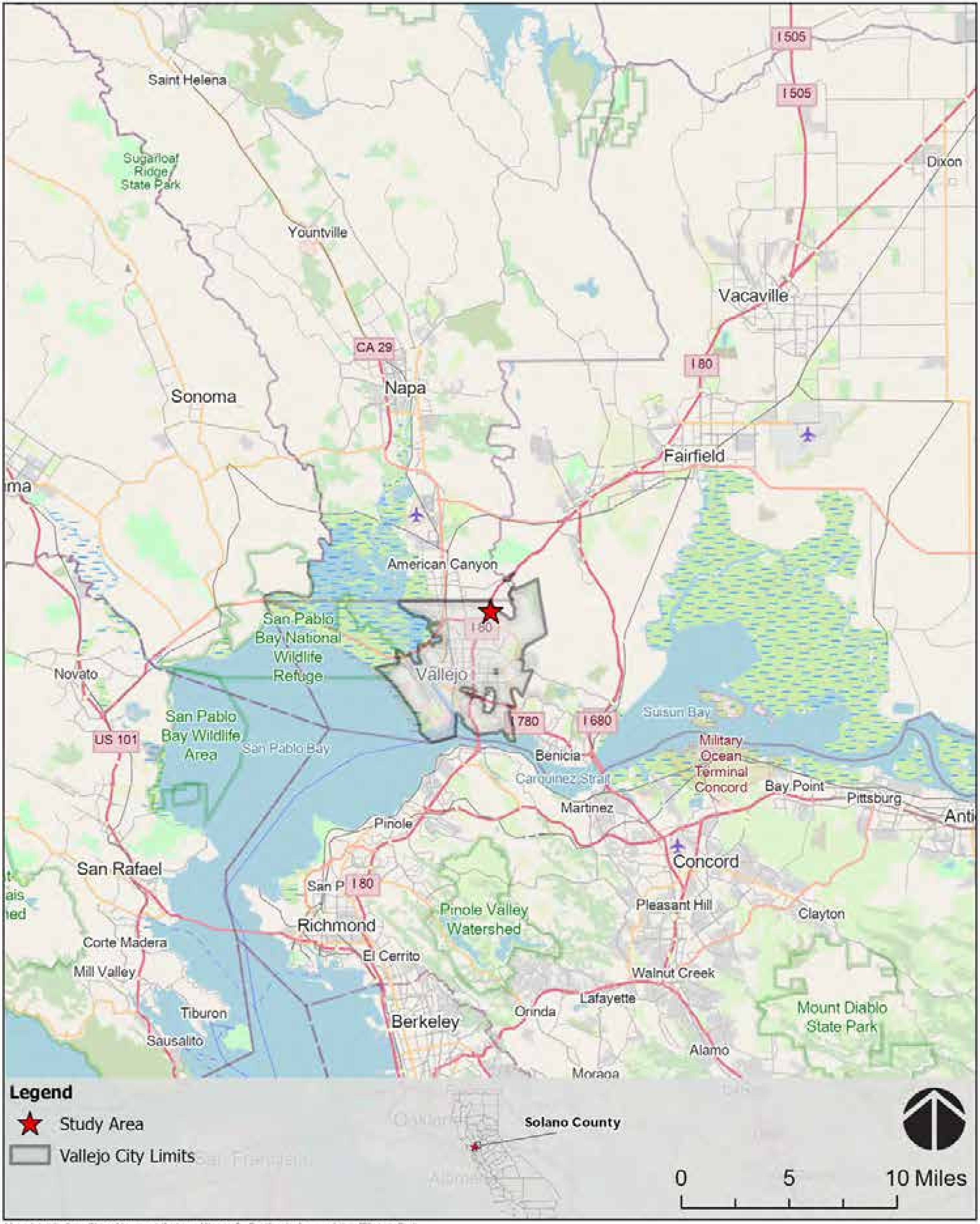
Introduction

The Scotts Valley Band of Pomo Indians (Tribe) has submitted an application to the U.S. Bureau of Indian Affairs (BIA) to acquire into trust four parcels, Assessor's Parcel Number (APN) 0182-010-010, 0182-020-020, 0182-020-080, and 0182-020-010, which total approximately 160 acres (proposed fee-to-trust property) and are located within the City of Vallejo, Solano County, California. Following acquisition into trust, the Tribe intends to develop the proposed fee-to-trust property for the purposes of gaming and economic development (Proposed Project). For the purposes of this report, the Study Area includes the totality of the proposed fee-to-trust property. **Figure 1** and **2** show the location of the Study Area, and **Figure 3** presents an aerial photograph of the Study Area and the immediate vicinity. The Study Area is located at the northeast corner of the intersection of Interstate 80 (I-80) and Columbus Parkway in Section 5, Township 3 North, Range 3 West, and Section 32, Township 4 North, Range 3 West, Mount Diablo Base and Meridian within the Cordelia 7.5-minute U.S. Geological Survey (USGS) quadrangle.

The Proposed Project consists of the acquisition by the BIA of the proposed fee-to-trust property into federal trust status for the Tribe. Following the acquisition of the land into trust, the Tribe proposes to develop a casino, Tribal housing, a Tribal administration building, and associated parking and infrastructure. A site plan is provided as **Figure 4**. The proposed casino would consist of eight stories and would include a gaming floor, restaurants, bars, and a ballroom/event space. Casino infrastructure would support guest and employee parking, a bus depot, a loading dock, and back-of house functions.

In addition to the casino complex, Tribal housing and community development is proposed in the northern portion of the Study Area, including 24 single-family residences and a Tribal administration building. The Tribal administration building would provide offices for up to 30 Tribal employees.

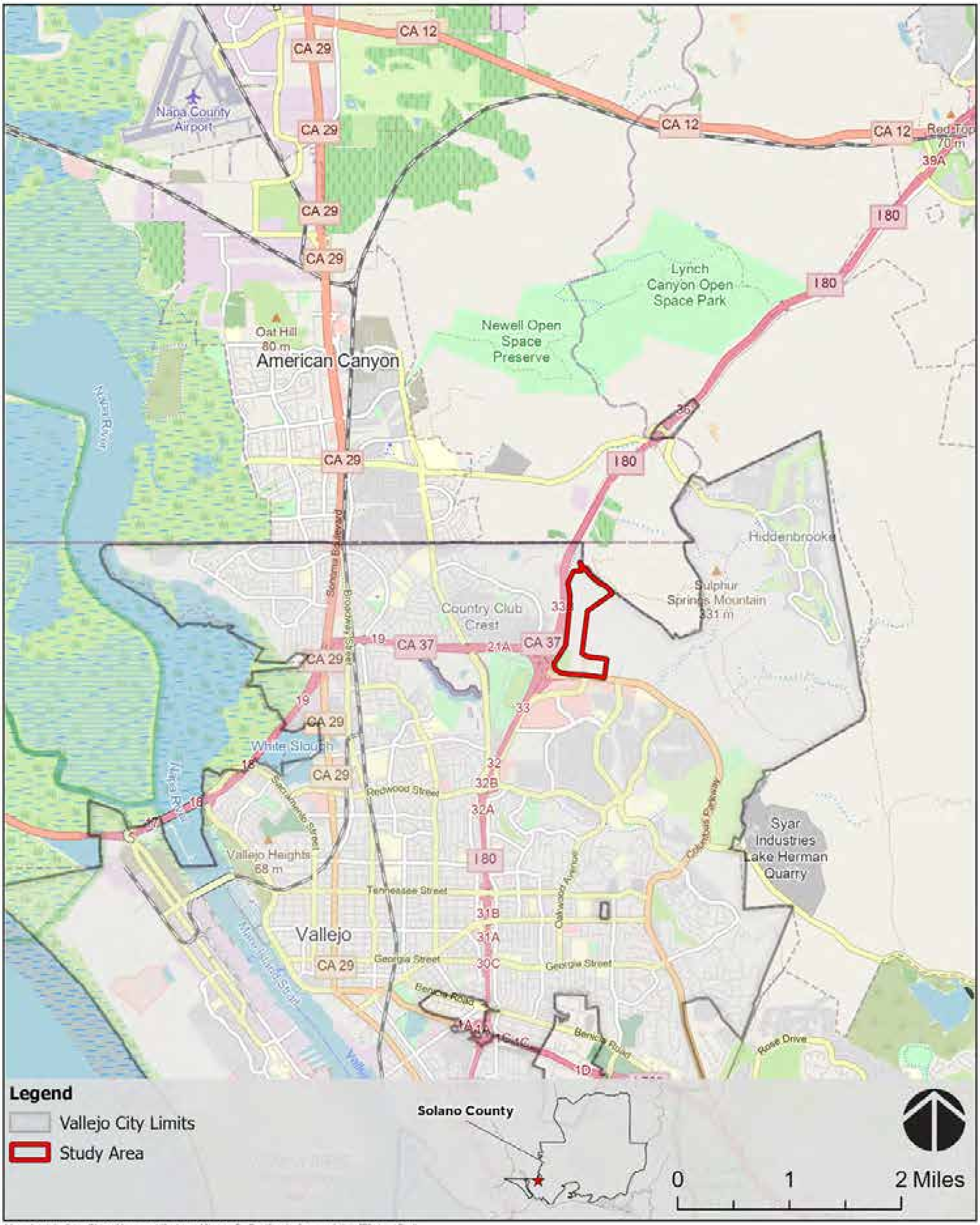
Access to the property would be via the intersection of an existing gravel road with Columbus Parkway. This existing access driveway would be upgraded and new paved roads would be constructed. As a component of the Proposed Project, the Tribe has committed to the establishment of an approximately 45.1-acre biological preserve within the Study Area that is designed to protect habitat of the greatest quality and value for special-status species. The Tribe intends to memorialize this commitment via a Tribal ordinance and a Memorandum of Understanding (MOU) between the Tribe, BIA, and U.S. Fish and Wildlife Service (USFWS). The site plan provided in **Figure 4** outlines the footprint of ground disturbance as well as the biological preserve.



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

FIGURE 1

REGIONAL LOCATION



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

FIGURE 2
SITE AND VICINITY

Esri Community Maps Contributors, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census

FIGURE 3
AERIAL OVERVIEW

Esri Community Maps Contributors, County of Solano, California State Parks, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of

FIGURE 4
SITE PLAN

The approximate size of the Proposed Project footprint (project footprint) consists of approximately 53.6 acres, inclusive of the totality of grading areas and lands isolated within grading areas. Stockpiling of materials and staging of equipment would be within the project footprint and would not result in additional areas of impacts.

The Proposed Project would adhere to the following Best Management Practices (BMPs) as it relates to biological and aquatic resources:

- Pets shall not be allowed on site during construction.
- Waste receptacles shall be made available within the Project Site and shall be properly maintained, with regular trash removal. All trash and food items should be promptly contained within closed, wildlife-proof containers. These should be regularly removed from the Project Site to reduce the attractiveness of the area to ravens and other predators.
- Construction equipment shall be cleaned prior to use in the Project Site in order to prevent the spread of invasive or noxious species to the Project Site. When applicable, weed-free dirt, mulch, gravel, and other materials should be used.
- Open trenches shall be covered at the end of each workday or shall have ramps installed at regular intervals to prevent the entrapment of wildlife. In addition, the project proponent, its agents, or contractors shall cover or fill all potential pitfalls to wildlife or cavities in which wildlife may become trapped when not attended. These include pits, trenches, vats, buckets, pipes, etc.
- Equipment and materials that could provide refuge for wildlife shall be checked prior to use or movement to ensure wildlife are not present. If present, wildlife shall be allowed to vacate the area unharmed on their own.
- Exterior lighting shall be downcast and shielded such that lighting and glare do not overspill the built environment.
- Uplighting, disruptive flashing lights, or materials that cause excessive glare shall not be used.
- The Proposed Action shall install stormwater treatment devices and create a stormwater detention basin, or series of basins, which are sized properly to collect, treat, detain, and release stormwater effectively. Treatment devices shall consist of some combination of the following: bioswales, infiltration trenches, oil-water separators, permeable pavement, rain gardens, and sediment traps. Ideally, the detention basins would be designed to sustain constructed wetlands and serve as habitat for federally-protected aquatic animals (California red-legged frog (CRLF), and northwestern pond turtle).
- Coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit shall be obtained from the U.S. Environmental Protection Agency (EPA) for construction site runoff during the construction phase in compliance with the Clean Water Act (CWA).
- A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared, implemented, and maintained throughout the construction phase of the development, consistent with General Construction Permit requirements. The SWPPP would include, but would not be limited to, the following BMPs to minimize storm water effects to water quality during construction:
    - Grading activities shall be limited to the immediate area required for construction.
    - Temporary erosion control measures (such as silt fences, fiber rolls, staked straw bales, temporary re-vegetation, rock bag dams, erosion control blankets, and sediment traps) shall be employed as needed for disturbed areas. Plastic monofilament or similar materials that could entangle wildlife shall not be used.
    - Construction activities shall be scheduled to minimize land disturbance during peak runoff periods to the extent feasible.

- Disturbed areas shall be paved, re-vegetated, and/or stabilized following construction activities.
- A spill prevention and countermeasure plan shall be developed that identifies proper storage, collection, and disposal measures for potential pollutants used on-site.
- Petroleum products shall be stored, handled, used, and disposed of properly in accordance with provisions of the CWA (33 USC §§ 1251 to 1387).
- Construction materials shall be stored, covered, and isolated to prevent runoff loss and contamination of surface and groundwater.
- Fuel and vehicle maintenance areas shall be limited to the impact area.
- Sanitary facilities shall be provided for construction workers.
- To minimize dust generation during construction, soil will be wetted down with water prior to ground disturbance as needed.
- Generated waste shall be properly disposed of.

The purpose of this memorandum is to provide an analysis of state-listed species that may occur within the Study Area. A separate Biological Assessment has been prepared to facilitate consultation with USFWS pursuant to Section 7 of the Endangered Species Act.

Methods

Database Queries

State-listed species with the potential to occur within the Study Area and vicinity were compiled based upon the following:

- A spatial query of the California Natural Diversity Database (CNDDB);
- A query of the California Native Plant Society's database Inventory of Rare and Endangered Plants of California (online edition); and
- A review of previous biological reports prepared for the Study Area.

Biological Field Survey

Field visits have previously been conducted within the Study Area in October 2005, and on November 8, 2005; May 17 and 23, 2006; July 5, 2006; January 31, 2007; February 10, 2007; March 28, 2007; April 4 and 11, 2007; July 10, 2007; September 19, 2013; December 17, 2015; November 15, 2019; April 22, 2020; May 22, 2020; August 11, 2020; September 7, 2022; and June 27, 2023 (Huffman Broadway Group 2005 and 2006; Jennings 2008; AES 2016; Montrose Environmental Solutions, 2022 and 2023; Monk and Associates, 2022).

Consulting biologist Dr. G.O. Graening performed an updated biological field assessment and a formal wetland delineation of the Study Area on April 3, 2024 and May 4, 2024. During these surveys, data on wildlife and plant species present, as well as habitat types and jurisdictional waters were collected. Consulting botanist Tim Nosal, M.S. performed a botanical survey of the Study Area on April 7, 2024 and June 1, 2024. Variable-intensity pedestrian surveys were performed for all surveys. Fauna and flora were identified to the lowest possible taxon. Habitat types occurring in the Study Area were mapped on aerial photographs, and information on habitat conditions and the suitability of habitats to support listed species was also recorded.

Habitat Mapping

Locations of species' occurrences and habitat boundaries within the Study Area were recorded on aerial photographs and digitized to produce habitat maps. Boundaries of potentially jurisdictional water resources within the Study Area were similarly digitized to calculate acreages and produce aquatic resources delineation maps. Geographic analyses were performed using geographical information system software (ArcGIS 10, ESRI, Inc.). Vegetation communities were classified by Vegetation Series using the CNPS Vegetation Classification system (CNPS, 2024). For the purposes of this assessment, "State-listed species" has been defined to include: 1) species listed as Threatened or Endangered under CESA or proposed candidates for listing; 2) Fully Protected species, as designated by the CDFW; and 3) plant species meeting the definition of 'Rare' or 'Endangered' under California Environmental Quality Act Guidelines 14 CCR § 15125 (c) and/or 14 CCR § 15380, including plants listed on CNPS Lists 1A (presumed extinct in California), 1B (rare, threatened, or endangered in California and elsewhere), 2A (presumed extirpated in California, but more common elsewhere), and 2B (rare, threatened, or endangered in California, but more common elsewhere.

Results

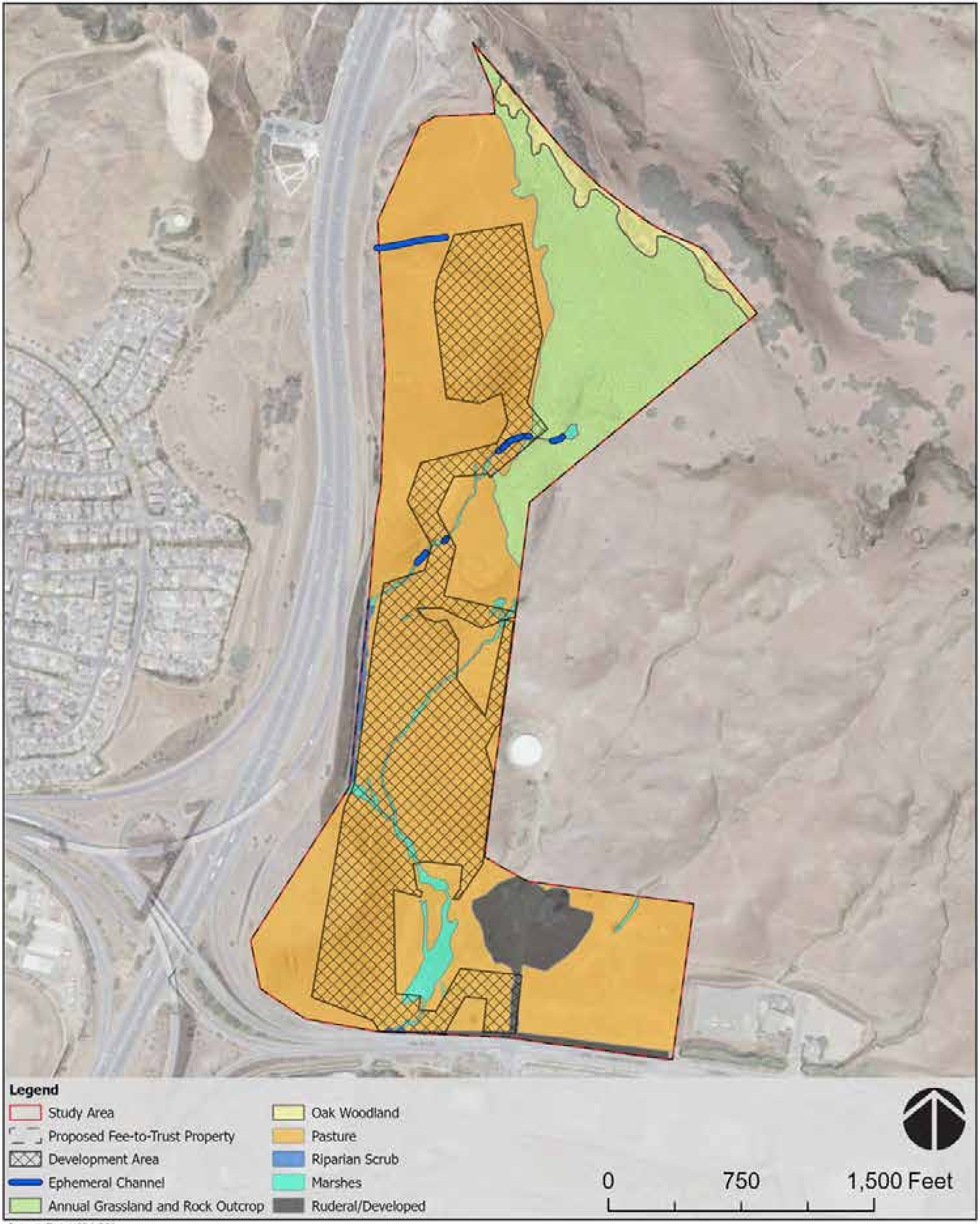
Environmental Setting

The Study Area is within the Central Coast geographic subregion, within the Central Western California region of the larger California Floristic Province (Baldwin et al., 2012). The Study Area falls within Climate Zone 17 "Marine effects in Southern Oregon, Northern, and Central California." Climate Zone 17 experiences a mild climate with cool, wet winters and cool summers with frequent fog and wind. Temperatures in this zone do not fall below 20 degrees Fahrenheit with an average high of 97 degrees Fahrenheit (Sunset, 2024).

The topography is a series of undulating hill slopes and valleys on the flank of Sulphur Springs Mountain. Elevations range between 130 feet above mean sea level in the southern portion of the Study Area to approximately 800 feet above mean sea level in the northern portion. The Study Area is largely undeveloped open space used primarily for cattle and horse grazing, except for a corridor of electrical transmission lines. There is also an elevated and graded pad in the southern portion of the Study Area that may have been contemplated as a development site in the past, but no built features are located on it. The existing access driveway also leads to numerous wooden shacks that are currently used as horse shelters. A mixture of wire and t-post fencing and chain link fencing bounds the grazing areas within the Study Area. Surrounding development includes commercial development to the south, rangeland to the north and east, and highways, a large vista rest stop, and residential developments to the west.

Habitat Types

Terrestrial habitats that occur within the Study Area consist of riparian scrub, freshwater marsh, pasture, and annual grassland/rock outcrop. These habitats are shown on **Figure 5** and discussed further below. Representative site photographs are provided in **Attachment A**, and a list of plant species observed during the 2024 site visits and animal species observed throughout all site visits is included as **Attachment B**. In addition to the habitat types discussed below, approximately 767 linear feet of channels was observed over five distinct channels.



Source: Esri, USDA FSA, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User

FIGURE 5
HABITAT TYPES

Ruderal/Developed (7.4 acres)

Ruderal/developed habitats are those areas that are highly modified from their natural state and are subject to intensive land management, paving, or similar. Within the Study Area, ruderal developed areas included an unpaved access drive and informal parking areas, fencing, and horse shelters. Vegetation was sparse to absent in this area. Where vegetation did occur, it was dominated primarily by non-native grasses and invasive forbs.

Oak Woodland (3.7 acres)

A narrow strip of oak woodland occurs along the northern boundary of the Study Area along a hilltop crest. This habitat contains a significant canopy cover of coast live oak (*Quercus agrifolia*). Ground cover vegetation is similar to species observed within the annual grassland/rock outcrop habitat.

Freshwater Marsh (3.4 acres)

Freshwater marsh habitat was observed in the valleys of hills. The dominant plants in these areas are rushes (e.g. *Juncus bufonius*) and spikerushes (*Eleocharis*). Facultative grasses and forbs are also present, such as perennial ryegrass (*Lolium perenne*), Bermuda grass (*Cynodon dactylon*), curly dock (*Rumex crispus*), common monkeyflower (*Mimulus guttattus*), and pennyroyal (*Mentha* sp.). Ponded areas contain floating plants such as watercress (*Nasturtium officinale*). The water quality of these marshes has been impacted by cattle, which are allowed to wallow and graze in the wetlands.

Pasture (114.3 acres)

The majority of the Study Area is a simplified non-native grassland containing perennial ryegrass (*Lolium perenne*), wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), and other pasture grasses. These areas are subject to significant grazing pressure, and may have been plowed or conditioned previously. Non-native forbs are abundant, such as thistles (*Silybum*, *Carduus*), filarees (*Erodium*), star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echioides*), poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), and spiny cocklebur (*Xanthium spinosum*). Large patches of artichoke thistle (*Cynara cardunculus*) were also observed within this habitat.

Annual Grassland/Rock Outcrop (30.8 acres)

This non-native annual grassland community is similar to the pasture community described above, but contains a greater diversity of species and greater number of native species. This is due in part to the rocky terrain, which is more difficult for cattle to graze, and because the metamorphic soils and rock outcrops provide additional habitat niches. Native wildflowers were abundant, such as California poppy (*Eschscholzia californica*), golden violet (*Viola pedunculata*), owl's clover (*Castilleja*), and blue dicks (*Dichelostemma capitatum*). Seeps were common at the base of rock outcrops, and these wet areas created microhabitats for specialized plants, such as ferns and succulents (*Dudleya* spp.).

Wildlife and Wildlife Use

A list of animal species that have been observed during biological surveys completed on the Study Area is included in **Attachment B**. It is possible that the drainage features and adjacent upland habitat may provide dispersal habitat for some species, however, there is significant disturbance on and around the Study Area, including grazing, I-80 traffic, and urban land use. An active killdeer nest was detected just off the southeastern boundary of the Study Area. Although no further nests were detected, nesting birds may utilize vegetation throughout the Study Area.

Special-Status Species

For the purposes of this assessment, "special-status species" has been defined to include: 1) species listed as Threatened or Endangered under CESA or proposed candidates for listing; 2) Fully Protected species, as designated by the CDFW; and 3) plant species meeting the definition of 'Rare' or 'Endangered' under California Environmental Quality Act Guidelines 14 CCR § 15125 (c) and/or 14 CCR § 15380, including plants listed on CNPS Lists 1A (presumed extinct in California), 1B (rare, threatened, or endangered in California and elsewhere), 2A (presumed extirpated in California, but more common elsewhere), and 2B (rare, threatened, or endangered in California, but more common elsewhere).

A table of state-listed species with the potential to occur in the vicinity of the Study Area is included as **Attachment C**. **Attachment C** details the listing status, habitat requirements, and potential to occur within the Study Area for each species. Species with no potential to occur within the Study Area were ruled out based on factors such as unsuitable soils, lack of appropriate habitat, geographic range, or level of disturbance. The Proposed Project would result in impacts to the following habitats, summarized in **Table 1**.

Table 1: Habitat Types within Study Area

Habitat Type	Total Acreage within Study Area	Acreage within Biological Preserve*	Acreage within Project Footprint
Riparian scrub	0.4	0.0	0.0
Freshwater marsh	3.4	0.3	1.1
Pasture	114.3	10.7	51.8
Oak woodland	3.7	3.7	0.0
Ruderal/developed	7.4	0.0	0.4
Annual grassland/ rock outcrop	30.8	30.5	0.3
Channels	767 linear feet (lf)	65 lf	307 lf
Totals	**160.0**	**45.1**	**53.6**

* Note: There are a total of approximately 45.1 acres within the Biological Preserve. The individual habitat types appear to total slightly higher due to rounding.

The table below summarizes those state-protected species that may occur within the project footprint and therefore have the potential to be impacted by the Proposed Project. Grasslands includes both annual grasslands and pasture habitat.

Table 2: State-Protected Species That May Occur Within the Study Area

Species	Potential to Occur
Mammals	
Pallid bat	May forage over the Study Area. Roost habitat avoided.
Townsend's big-eared bat	May forage over the Study Area. Roost habitat avoided.
Hoary bat	May forage over the Study Area. Roost habitat avoided.
Big free-tailed bat	May forage over the Study Area. Roost habitat avoided.
Birds	
Golden eagle	May forage over grassland habitat. No nesting habitat present.
Great blue heron	May forage in the marsh habitat. No nesting habitat present.
Short-eared owl	May forage over grassland habitat. No nesting habitat present.

Burrowing owl	May forage in grassland habitat. Active burrows were not observed but could be established over time.
Ferruginous hawk	May forage over grassland habitat. No nesting habitat present.
Swainson's hawk	May forage over grassland habitat. No nesting habitat present.
Northern harrier	May forage over grassland habitat. No nesting habitat present.
White-tailed kite	May forage over grassland habitat. No nesting habitat present.
American peregrine falcon	May forage over grassland habitat. No nesting habitat present.
Invertebrates	
Obscure bumble bee	May occur within grassland habitat.
Crotch bumble bee	May occur within grassland habitat.
Western bumble bee	May occur within grassland habitat.
Plants	
Franciscan onion	May occur within grasslands.
Big-scale balsamroot	May occur within grasslands.
Big tarplant	May occur within grasslands.
Mt. Diablo fairy-lantern	May occur within grasslands.
Lyngbye's sedge	May occur within marshes.
Congdon's tarplant	May occur in grasslands within areas of clay soils.
Bolander's water-hemlock	May occur within marshes.
Mt. Diablo buckwheat	May occur within grasslands.
Fragrant fritillary	May occur within grasslands.
Diablo helianthella	May occur within grasslands.
Bridges' coast range shoulderband	May occur within grasslands.
Brewer's western flax	May occur within grasslands.
Carquinez goldenbush	May occur within grasslands.
Jepson's leptosiphon	May occur within grasslands.
California beaked-rush	May occur within marshes.
Napa bluecurls	May occur within grasslands.

Impact Assessment and Recommendations

State-listed mammals with the potential to occur on the Study Area are limited to bats that may forage over the project footprint or roost in trees or rock outcrops in the proposed biological preserve. The Proposed Project includes BMPs that would avoid uplighting, excessive noise, or other actions that would impact ongoing foraging over the project footprint or foraging and roosting beyond the project footprint. Therefore, impacts to state-protected mammals would be less than significant.

Although the land would be in trust prior to construction, state-protected birds would still be protected under the Migratory Bird Treaty Act of 1918. Construction activities that commence within the general nesting season have the potential to impact nesting birds. **Measure BIO-1** below is recommended to ensure that potential impacts to nesting birds are fully avoided. As discussed above, the Proposed Project has been designed with BMPs to avoid operational sensory disturbances to migratory birds, including state-listed birds that may occur on or in the vicinity of the Study Area.

Invertebrates with the potential to occur within the Study Area include three bumble bees. These species may forage across the Study Area, with the exception of the ruderal/developed habitat, which contained little to no vegetation. The highest quality nectar resource habitat occurs in the northern portion of the Study Area within the annual grassland/rock outcrop habitat. This area contains a wider variety and higher density of flowering plants due to the soil regimes and decreased grazing pressure and level of disturbance in this area. The Proposed Project would avoid over half of the nectar resource habitat and would place within a biological preserve over 90 percent of the higher quality nectar resources. This would provide ample foraging opportunities for bumble bees that may pass through the Study Area.

One special-status plant has been observed during surveys of the Study Area: Jepson's leptosiphon. This plant is ranked 1B.2 by the California Native Plant Society. Although this plant is not afforded specific protections on land held in trust, the Proposed Project avoids all locations of this plant and preserves over 90 percent of the suitable habitat for this species. All locations of this plant are within the biological preserve area. Therefore, impacts to this plant would not occur.

No other special-status plant species have been observed within the Study Area and are believed to be absent from the project footprint based upon extensive survey efforts and therefore would not be impacted.

Measure BIO-1: Nesting Birds

- If construction activities commence during the general nesting season (February 15 to September 1), a preconstruction nest survey shall be conducted by a qualified biologist on and within 100 feet of proposed construction, as accessible within 7 days of initiating ground disturbance. If active nests are identified, the qualified biologist shall determine a suitable avoidance buffer based on the needs of the species observed.
- Avoidance measures include establishment of a buffer zone using construction fencing or similar, or the postponement of construction until after the nesting season, or until after a qualified biologist has determined the nest is no longer active. Avoidance buffers may vary in size depending on habitat characteristics, project-related activities, and disturbance levels.
- Should work activity cease for 14 days or more during the nesting season, surveys shall be repeated to ensure birds and have not established nests during inactivity.

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Attachment A

Site Photographs

View looking south of southeastern corner of Study Area and entrance gate.

View looking north along western boundary of Study Area with willow scrub and emergent marsh

View looking west of a graded commercial pad with an erosion gully in a pasture setting

View looking southeast in the middle edge of the Study Area at degraded marsh and horses grazing on neighboring property

View looking northwest in the middle of the Study Area of marsh and electrical transmission lines, with the roadbed of Interstate 80 in the background and a channel and riparian habitat at the base.

Closeup view of the riparian vegetation (primarily arroyo willow)

View looking north of the primary drainage system, which is a series of intermittent channels and wetland pools

View looking south from the northern portion of the Study Area showing the metamorphic rock outcrop and steep slopes

View looking southwest from the northern portion of the Action Area showing the metamorphic rock outcrop and steep slopes and annual grassland

View looking south of pasture and rolling hills and drainage systems in the valleys, with I-80 on the right.

View looking north at the area proposed for tribal housing.

Attachment B
Species Observed

Plants and Animals Observed During the Acorn Environmental Field Surveys on April 3 and 7, May 4, and June 1, 2024, and Prior Field Surveys by Others

Common Name	Scientific Name
PLANTS	
Yarrow	*Achillea millefolium*
Mountain dandelion	*Agoseris sp.*
Bentgrass	*Agrostis sp.*
Silver hairgrass	*Aira caryophyllea*
Crinkled onion	*Allium crispum*
Greater ammi	*Ammi majus*
Common fiddleneck	*Amsinckia intermedia*
Rigid fiddleneck	*Amsinckia retrorsa*
Dog fennel	*Anthemis cotula*
Narrowleaf milkweed	*Asclepias fascicularis*
Hastate orache	*Atriplex prostrata*
Slender wild oat	*Avena barbata*
Coyote brush	*Baccharis pilularis*
Mediterranean lineseed	*Bellardia trixago*
False brome	*Brachypodium distachyon*
Black mustard	*Brassica nigra*
Quaking grass	*Briza minor*
Elegant brodiaea	*Brodiaea elegans*
Weedy brome	*Bromus caroli-henrici*
Ripgut brome	*Bromus diandrus*
Soft chess	*Bromus hordeaceus*
Madrid brome	*Bromus madritensis*
Red brome	*Bromus rubens*
Red maids	*Calandrinia ciliata*
Yellow mariposa lily	*Calochortus luteus*
Superb mariposa lily	*Calochortus superbus*
Western morning glory	*Calystegia occidentalis*
Shepherd’s purse	*Capsella bursa-pastoris*
Italian thistle	*Carduus pycnocephalus*
Slender flowered thistle	*Carduus tenuiflorus*
Valley tassels	*Castilleja attenuata*
Purple owl’s clover	*Castilleja exserta*
Purple star thistle	*Centaurea calcitrapa*
Maltese star thistle	*Centaurea melitensis*
Yellow star thistle	*Centaurea solstitialis*
Meadow chickweed	*Cerastium arvense subsp. strictum*
Sticky mouse-eared chickweed	*Cerastium glomeratum*
Wavy leaf soap plant	*Chlorogalum pomeridianum*
Bull thistle	*Cirsium vulgare*
Clarkia	*Clarkia sp.*
Miner’s lettuce	*Claytonia perfoliata*

Poison hemlock	*Conium maculatum*
Field bindweed	*Convolvulus arvensis*
Brass-buttons	*Cotula coronopifolia*
Pygmy weed	*Crassula tillaea*
Artichoke thistle	*Cynara cardunculus*
Cardoon	*Cynaria cardunculus*
Bermuda grass	*Cynodon dactylon*
Rattlesnake weed	*Daucus pusillus*
Bush monkeyflower	*Diplacus aurantiacus*
Stinkwort	*Dittrichia graveolens*
Canyon dudleya	*Dudleya cymosa*
Mexican tea	*Dysphania ambrosioides*
Creeping spikerush	*Eleocharis macrostachya*
Tall willowherb	*Epilobium brachycarpum*
Naked buckwheat	*Eriogonum nudum*
Broad leaved filaree	*Erodium botrys*
Red-stemmed filaree	*Erodium cicutarium*
White stem filaree	*Erodium moschatum*
Coyote thistle	*Eryngium sp.*
Yellow monkeyflower	*Erythranthe guttata*
California fawn lily	*Erythronium californicum*
California poppy	*Eschscholzia californica*
Blue gum	*Eucalyptus globulus*
Petty spurge	*Euphorbia peplus*
Pacific fescue	*Festuca microstachys*
Rattail sixweeks grass	*Festuca myuros*
Italian ryegrass	*Festuca perennis*
Fennel	*Foeniculum vulgare*
California coffeeberry	*Frangula californica*
Bedstraw	*Galium aparine*
Wall bedstraw	*Galium parisiense*
Nit grass	*Gastridium phleoides*
Cutleaf geranium	*Geranium dissectum*
Bird’s eye gilia	*Gilia tricolor*
Waxy mannagrass	*Glyceria declinata*
Salt heliotrope	*Heliotropium curassavicum*
Bristly oxtongue	*Helminthotheca echioides*
Hayfield tarplant	*Hemizonia congesta*
Few flowered evax	*Hesperevax sparsifolia var sparsiflora*
California western flax	*Hesperolinon californicum*
Shortpod mustard	*Hirschfeldia incana*
Meadow barley	*Hordeum brachyantherum*
Mediterranean barley	*Hordeum marinum ssp. gussoneanum*
Hare barley	*Hordeum murinum subsp. leporinum*
Wall barley	*Hordeum murinum*
Smooth cat’s-ear	*Hypochaeris glabra*

Rough cat's-ear	*Hypochaeris radiata*
Hyssop loosestrife	*Lythrum hyssopifolia*
Black walnut	*Juglans nigra*
Baltic rush	*Juncus balticus*
Toad rush	*Juncus bufonius*
Iris-leaved rush	*Juncus xiphioides*
Willow lettuce	*Lactuca saligna*
Prickly lettuce	*Lactuca serriola*
Bitter lettuce	*Lactuca virosa*
California goldfields	*Lasthenia californica*
Hawkbit	*Leontodon saxatilis*
Field pepperweed	*Lepidium campestre*
Perennial pepperweed	*Lepidium latifolium*
Shining peppergrass	*Lepidium nitidum*
Jepson's leptosiphon	*Leptosiphon jepsonii*
California cottonrose	*Logfia filaginoides*
Lomatium	*Lomatium sp.*
Bird's-foot trefoil	*Lotus corniculatus*
Western lupine	*Lupinus formosus*
Scarlet pimpernel	*Lysimachia arvensis*
Hyssop loosestrife	*Lythrum hyssopifolia*
Alkali mallow	*Malvella leprosa*
California man-root	*Marah fabacea*
German chamomile	*Matricaria chamomilla*
California burclover	*Medicago polymorpha*
California melic grass	*Melica californica*
Silverpuffs	*Microseris sp.*
Seep monkeyflower	*Mimulus guttatus*
Watercress	*Nasturtium officinale*
Olive	*Olea europaea*
Bermuda buttercup	*Oxalis pes-caprae*
Goldback fern	*Pentagramma triangularis*
Kellogg's Yampah	*Perideridia kelloggii*
Common phacelia	*Phacelia distans*
Imbricate phacelia	*Phacelia imbricata*
Phacelia	*Phacelia sp.*
Dwarf plantain	*Plantago erecta*
English plantain	*Plantago lanceolata*
Annual bluegrass	*Poa annua*
One-sided bluegrass	*Poa secunda*
Bluegrass	*Poa sp.*
Licorice fern	*Polypodium arenastrum*
Rabbit's-foot grass	*Polypogon monspeliensis*
Cherry plum	*Prunus cerasifera*
Cudweed	*Pseudognaphalium sp.*
Fairy mist	*Pterostegia drymarioides*

Pear	*Pyrus sp.*
Coast live oak	*Quercus agrifolia*
California buttercup	*Ranunculus californicus*
White water buttercup	*Ranunculus lobbii*
Prickleseed buttercup	*Ranunculus muricatus*
Western buttercup	*Ranunculus occidentalis*
Black locust	*Robinia pseudoacacia*
Himalayan blackberry	*Rubus armeniacus*
Sheep sorrel	*Rumex acetosella*
Curly dock	*Rumex crispus*
Fiddleleaf dock	*Rumex pulcher*
Arroyo willow	*Salix lasiolepis*
Blue elderberry	*Sambucus nigra ssp. caerulea*
Poison sanicle	*Sanicula bipinnata*
Purple sanicle	*Sanicula bipinnatifida*
California bee plant	*Scrophularia californica*
Old man of spring	*Senecio vulgare*
Field madder	*Sherardia arvensis*
Windmill pinks	*Silene gallica*
Milk thistle	*Silybum marianum*
Blue-eyed grass	*Sisyrinchium bellum*
White nightshade	*Solanum americanum*
South American soliva	*Soliva sessilis*
Sow thistle	*Sonchus oleraceus*
White hedge nettle	*Stachys albens*
Hedge nettle	*Stachys pycnantha*
Purple needlegrass	*Stipa pulchra*
Tall sock-destroyer	*Torilis arvensis*
Dwarf sack clover	*Trifolium depauperatum*
Poison-oak	*Toxicodendron diversilobum*
Hop clover	*Trifolium dubium*
Strawberry clover	*Trifolium fragiferum*
Rose clover	*Trifolium hirtum*
Thimble clover	*Trifolium microdon*
Subterranean clover	*Trifolium subterraneum*
White tipped clover	*Trifolium variegatum*
Ithuriel's spear	*Triteleia laxa*
California bay	*Umbellularia californica*
Dwarf nettle	*Urtica urens*
Spring vetch	*Vicia sativa*
Winter vetch	*Vicia villosa*
California golden violet	*Viola pedunculata*
Narrow leaf mule ears	*Wyethia angustifolia*
Spiny cocklebur	*Xanthium spinosum*
Muehlenberg's centaury	*Zeltnera muehlenbergii*
ANIMALS	

red-winged blackbird	*Agelaius phoeniceus*
American pipit	*Anthus rubescens*
western scrub-jay	*Aphelocoma californica*
yellow faced bumblebee	*Bombus* sp.
cow	*Bos taurus*
California toad	*Bufo boreas halophilus*
red-tailed hawk	*Buteo jamaicensis*
red-shouldered hawk	*Buteo lineatus*
Anna’s hummingbird	*Calypte anna*
turkey vulture	*Cathartes aura*
killdeer	*Charadrius vociferus*
Northern harrier	*Circus hudsonius*
California striped racer	*Coluber lateralis lateralis*
rock dove	*Columbia livia*
American crow	*Corvus brachyrhynchos*
common raven	*Corvus corax*
horse	*Equus caballus*
Brewer’s blackbird	*Euphagus cyanocephalus*
American kestrel	*Falco sparverius*
Feral cat	*Felis catus*
house finch	*Haemorhous mexicanus*
barn swallow	*Hirundo rustica*
black-tailed jackrabbit	*Lepus californicus*
song sparrow	*Melospiza melodia*
California towhee	*Melozone crissalis*
California vole	*Microtus californicus*
northern mockingbird	*Mimus polyglottos*
brown-headed cowbird	*Molothrus ater*
Columbian black-tailed deer	*Odocoileus hemionus columbianus*
California ground squirrel	*Otospermophilus beecheyi*
savannah sparrow	*Passerculus sandwichensis*
deer mouse	*Peromyscus maniculatus*
Cliff swallow	*Petrochelidon pyrrhonota*
raccoon	*Procyon lotor*
bushtit	*Psaltriparus minimus*
Sierran treefrog	*Pseudacris sierra*
skipper butterfly	*Pyrginae*
black phoebe	*Sayornis nigricans*
Say’s phoebe	*Sayornis saya*
northwestern fence lizard	*Sceloporus occidentalis occidentalis*
Yellow-rumped warbler	*Setophaga coronata*
Callippe silverspot butterfly	*Speyeria callippe callippe*
lesser goldfinch	*Spinus psaltria*
American goldfinch	*Spinus tristis*
northern rough-winged sparrow	*Stelgidopteryx serripennis*
western meadowlark	*Sturnella neglecta*

European starling	*Sturnus vulgaris*
violet green swallow	*Tachycineta thalassina*
northern rough-skinned newt	*Taricha granulosa granulosa*
Botta's pocket gopher	*Thomomys bottae*
Bewick's wren	*Thryomanes bewickii*
Western kingbird	*Tyrannus verticalis*
mourning dove	*Zenaida macroura*
golden-crowned sparrow	*Zonotrichia atricapilla*
white-crowned sparrow	*Zonotrichia leucophrys*

Attachment C

Species Table

Special-Status Species with Potential to Occur in the Vicinity of the Project Site

Common Name ***Scientific Name***	**Status**	**Life History/Habitat***	**Potential to Occur**
Mammals			
Pallid bat *Antrozous pallidus*	CSSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Yes. Suitable habitat occurs in the rock outcrops and oak woodlands in the hilly northern portion of the project site.
Townsend's big-eared bat *Corynorhinus townsendii*	CSSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls & ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Yes. Suitable habitat occurs in the rock outcrops and oak woodlands in the hilly northern portion of the project site.
Hoary bat *Lasiurus cinereus*	CSSC	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	Yes. Suitable habitat occurs in the rock outcrops and oak woodlands in the hilly northern portion of the project site.
Big free-tailed bat *Nyctinomops macrotis*	CSSC	Low-lying arid areas in southern California. Need high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	Yes. Suitable habitat occurs in the rock outcrops and oak woodlands in the hilly northern portion of the project site.
Suisun shrew *Sorex ornatus sinuosus*	CSSC	Tidal marshes of the northern shores of San Pablo and Suisun bays. Requires dense low-lying cover and driftweed and other litter above the mean hightide line for nesting and foraging.	No. No tidal marsh habitat present in project site.
Birds			
Cooper's hawk *Accipiter cooperii*	CSSC	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, in canyon bottoms on river flood-plains; also, within live oaks.	Yes. Potential habitat present in project site where riparian and oak woodland habitats occur.
Tricolored blackbird *Agelaius tricolor*	CT	Highly colonial species, most numerous in central valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	No. No open water in project site.
Golden eagle *Aquila chrysaetos*	CSSC	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Yes. Potential foraging habitat present in project site where grassland habitats occur.
Great blue heron *Ardea herodias*	CSSC	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	Yes. Potential foraging habitat present in project site where marshes occur.

Short-eared owl *Asio flammeus*	CSSC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	Yes. Potential foraging habitat present in project site where grassland habitats occur.
Burrowing owl *Athene cunicularia*	CSSC	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Yes. Potential habitat present in project site where grassland habitats occur.
Ferruginous hawk *Buteo regalis*	CSSC	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon-juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Yes. Potential foraging habitat present in project site where grassland habitats occur.
Swainson's hawk *Buteo swainsoni*	CT	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Yes. Potential foraging habitat present in project site where grassland habitats occur.
Northern harrier *Circus hudsonius*	CSSC	Inhabits prairies, open areas, and marshes.	Yes. Suitable habitat present.
Yellow rail *Coturnicops noveboracensis*	CSSC	Summer resident in eastern Sierra Nevada in Mono County. Large fresh-water marshlands.	No. No large marshes or other bodies of water present in project site.
Snowy egret *Egretta thula*	CSSC	Colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	No. No tule marshes or other bodies of water present in project site.
White-tailed kite *Elanus leucurus*	CSSC	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Yes. Potential foraging habitat present in project site where grassland and oak woodland habitats occur.
American peregrine falcon *Falco peregrinus anatum*	CSSC	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Yes. Potential foraging habitat present in project site where grassland habitats occur.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	CSSC	Resident of the San Francisco bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	No. No large marshes or other bodies of water present in project site.
Caspian tern *Hydroprogne caspia*	CSSC	Nests on sandy or gravely beaches and shell banks in small colonies inland and along the coast. Inland fresh-water lakes and marshes; also, brackish or salt waters of estuaries and bays.	No. No coastal habitat present in project site.
California black rail *Laterallus jamaicensis coturniculus*	CT	Inhabits freshwater marshes, wet meadows & shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that does not fluctuate during the year and dense vegetation for nesting habitat.	No. No large marshes or other bodies of water present in project site.

Suisun song sparrow *Melospiza melodia maxillaris*	CSSC	Resident of brackish-water marshes surrounding Suisun bay. Inhabits cattails, tules and other sedges, and salicornia; also known to frequent tangles bordering sloughs.	No. No tidal marsh habitat present in project site.
San Pablo song sparrow *Melospiza melodia samuelis*	CSSC	Resident of salt marshes along the north side of San Francisco and San Pablo bays. Inhabits tidal sloughs in the salicornia marshes; nests in grindelia bordering slough channels.	No. No tidal marsh habitat present in project site.
Black-crowned night heron *Nycticorax nycticorax*	CSSC	Colonial nester, usually in trees, occasionally in tule patches. Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	No. No large marshes or other bodies of water present in project site.
Osprey *Pandion haliaetus*	CSSC	Ocean shore, bays, fresh-water lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	No. No large bodies of water present in project site.
Bank swallow *Riparia riparia*	CT	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	No. No riparian or river habitat present in project site.
Fish			
Delta smelt *Hypomesus transpacificus*	FT, CE	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities > 10 ppt. Most often at salinities < 2ppt.	No. No fish-bearing waters present in project site.
Sacramento splittail *Pogonichthys macrolepidotus*	CSSC	Endemic to the lakes and rivers of the central valley, but now confined to the delta, Suisun Bay and associated marshes. Slow moving river sections, dead end sloughs. Requires flooded vegetation for spawning and foraging for young.	No. No fish-bearing waters present in project site.
Longfin smelt *Spirinchus thaleichthys*	FC, CT	Euryhaline, nektonic, and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column.	No. No fish-bearing waters present in project site.
Invertebrates			
Obscure bumble bee *Bombus caliginosus*	CSSC	Grasslands.	Yes. Potential habitat present in project site where grassland habitats occur.
Crotch bumble bee *Bombus crotchii*	CSSC	Grasslands.	Yes. Potential habitat present in project site where grassland habitats occur.
Western bumble bee *Bombus occidentalis*	CSSC	Grasslands. Once common and widespread, species has declined precipitously from central California to southern British Columbia, perhaps from disease.	Yes. Potential habitat present in project site where grassland habitats occur.
An isopod *Calasellus californicus*	CSSC	Known from perennial springs in Lake, Napa, Marin, Santa Cruz, and Santa Clara Counties.	No. No perennial springs present in project site.

Western ridged mussel *Gonidea angulata*	CSSC	Primarily creeks and rivers and less often lakes. Originally in most of state, now extirpated from central & southern California.	No. No perennial rivers or lakes in project site.
California linderiella *Linderiella occidentalis*	CSSC	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity and conductivity.	No. No vernal pools present in project site.
Wilbur Springs shorebug *Saldula usingeri*	CSSC	Requires springs/creeks with high concentrations of sodium, chlorine, and lithium. Found only on wet substrate of spring outflows.	No. No mineral springs present in project site.
California freshwater shrimp *Syncaris pacifica*	FE, CE	Endemic to Marin, Napa, and Sonoma Counties. Found in low elevation, low gradient streams where riparian cover is moderate. Shallow pools away from main streamflow. Winter: undercut banks w/exposed roots. Summer: leafy branches touching water.	No. No perennial springs or streams present in project site.
Reptiles			
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT, CT	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats. Mostly south-facing slopes and ravines, with rock outcrops, deep crevices or abundant rodent burrows, with shrubs.	No. The Study Area falls within the plan area of the draft Solano Multispecies Habitat Conservation Plan (SMHCP). The SMHCP has been developed in consultation with the USFWS and includes those species with the potential to occur within the plan area, including the Study Area. Alameda whipsnake was not included within the draft SMHCP, and therefore was determined to be outside of the plan area, including the Study Area. The nearest record of this species in relation to the Study Area is nine miles south of the Study Area; this area is separated from the Study Area by the Sacramento River/Carquinez Strait. This species is not known to occur within Solano County.
Amphibians			
Foothill yellow-legged frog *Rana boylii*	CE	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.	No. No perennial springs or streams present in project site.

Plants			
Franciscan onion *Allium peninsulare var. Franciscanum*	1B.2	Cismontane woodland, valley and foothill grassland. Clay soils; often on serpentine. Dry hillsides. 100-300 m.	Yes. Potential habitat present in project site where grassland and oak woodland habitats occur.
Alkali milk-vetch *Astragalus tener var. Tener*	1B.2	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 1-170m.	No. No suitable habitat present.
Vernal pool smallscale *Atriplex persistens*	1B.2	Alkaline vernal pools. 10-115 m.	No. No suitable habitat present.
Big-scale balsamroot *Balsamorhiza macrolepis*	1B.2	Valley and foothill grassland, cismontane woodland. Sometimes on serpentine. 35-1,000 m.	Yes. Potential habitat present in project site where grassland and oak woodland habitats occur.
Big tarplant *Blepharizonia plumosa*	1B.1	Valley and foothill grassland. Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas. 15-455 m.	Yes. Potential habitat present in project site where grassland habitats occur.
Narrow-anthered brodiaea *Brodiaea leptandra*	1B.2	Broadleafed upland forest, chaparral, lower montane coniferous forest. 110-915 m.	Yes. Potential habitat present in project site where oak woodland habitats occur.
Mt. Diablo fairy-lantern *Calochortus pulchellus*	1B.2	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland. On wooded and brushy slopes. 200-800 m.	Yes. Potential habitat present in project site where grassland and oak woodland habitats occur.
Lyngbye's sedge *Carex lyngbyei*	2B.2	Marshes and swamps (brackish or freshwater). 0 m.	Yes. Potential habitat present in project site where marshes occur.
Holly-leaved ceanothus *Ceanothus purpureus*	1B.2	Chaparral. Rocky, volcanic slopes. 120-640m.	No. No suitable habitat present.
Congdon's tarplant *Centromadia parryi ssp. congdonii*	1B.1	Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay. 1-230 m.	Yes. Potential habitat present where grassland and clay soils occur.
Pappose tarplant *Centromadia parryi ssp. parryi*	1B.2	Coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland. Vernally mesic, often alkaline sites. 2-420 m.	No. No suitable habitat present.
Bolander's water-hemlock *Cicuta maculata var. bolanderi*	2B.1	Marshes, fresh or brackish water. 0-200 m.	Yes. Potential habitat present in project site where marshes occur.
Western leatherwood *Dirca occidentalis*	1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, coast coniferous forest, riparian forest, riparian	Yes. Potential habitat present in project site where oak woodland habitats occur.

		woodland. On brushy slopes, mesic sites; mostly in mixed evergreen and foothill woodland communities. 30-550 m.	
Dwarf downingia *Downingia pusilla*	2B.2	Valley and foothill grassland (mesic sites), vernal pools. Vernal lake and pool margins with a variety of associates. In several types of vernal pools. 1-485 m.	No. No suitable habitat present.
Greene's narrow-leaved daisy *Erigeron greenei*	1B.2	Chaparral. Serpentine and volcanic substrates, generally in shrubby vegetation. 75-1,060 m.	No. No suitable habitat present.
Mt. Diablo buckwheat *Eriogonum truncatum*	1B.1	Chaparral, coastal scrub, valley and foothill grassland. Dry, exposed clay or sandy substrates. 3-350 m.	Yes. Potential habitat present in project site where grassland habitats occur.
Jepson's coyote-thistle *Eryngium jepsonii*	1B.2	Vernal pools.	No. No suitable habitat present.
San Joaquin spearscale *Extriplex joaquinana*	1B.2	Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with *distichlis spicata*, *frankenia*, etc. 1-250 m.	No. No suitable habitat present.
Fragrant fritillary *Fritillaria liliacea*	1B.2	Coastal scrub, valley and foothill grassland, coastal prairie. Often on serpentine; various soils reported though usually clay, in grassland. 3-410 m.	Yes. Potential habitat present in project site where grassland habitats occur.
Diablo helianthella *Helianthella castanea*	1B.2	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade. 25-1,150 m.	Yes. Potential habitat present in project site where grassland and oak woodland habitats occur.
Bridges' coast range shoulderband *Helminthoglypta nickliniana bridgesi*	CSSC	Inhabits open hillsides of alameda and contra costa counties. Tends to colonize under tall grasses and weeds.	Yes. Potential habitat present in project site where grassland habitats occur.
Brewer's western flax *Hesperolinon breweri*	1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Often in rocky serpentine soil in serpentine chaparral and serpentine grassland. 30-885 m.	Yes. Potential habitat present in project site where grassland and oak woodland habitats occur.
Carquinez goldenbush *Isocoma arguta*	1B.1	Valley and foothill grassland. Alkaline soils, flats, lower hills. On low benches near drainages and on tops and sides of mounds in swale habitat. 1-20 m.	Yes. Potential habitat present in project site where grassland habitats occur.
Delta tule pea *Lathyrus jepsonii var. jepsonii*	1B.2	Freshwater and brackish marshes. Often found with typha, aster lentus, rosa calif., juncus spp., scirpus, etc. Usually on marsh and slough edges.	No. No suitable habitat present.

Legenere *Legenere limosa*	1B.1	Vernal pools. Many historical occurrences are extirpated. In beds of vernal pools. 1-880 m.	No. No suitable habitat present.
Jepson's leptosiphon *Leptosiphon jepsonii*	1B.2	Chaparral, cismontane woodland. Open to partially shaded grassy slopes. On volcanics or the periphery of serpentine substrates. 100-500 m.	Yes. Potential habitat present in project site where grassland and oak woodland habitats occur.
Mason's lilaeopsis *Lilaeopsis masonii*	1B.1	Freshwater and brackish marshes, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or riverbank erosion. 0-10 m.	No. No suitable habitat present.
Delta mudwort *Limosella australis*	2B.1	Delta bays and backwaters.	No. No suitable habitat present.
Baker's navarretia *Navarretia leucocephala ssp. bakeri*	1B.1	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales; adobe or alkaline soils. 5-950 m.	No. No suitable habitat present.
California alkali grass *Puccinellia simplex*	1B.2	Alkaline soils.	No. No suitable habitat present.
California beaked-rush *Rhinophoral californica*	1B.1	Bogs and fens, marshes and swamps, lower montane coniferous forest, meadows and seeps. Freshwater seeps and open marshy areas. 45-1,010 m.	Yes. Potential habitat present in project site where mash habitats occur.
Chaparral ragwort *Senecio aphanitic*	2B.2	Chaparral, cismontane woodland, coastal scrub. Drying alkaline flats. 15-800 m.	Yes. Potential habitat present in project site where oak woodland habitats occur.
Napa checkerbloom *Sidalcea hickmanii ssp. napensis*	1B.1	Chaparral. Rhyolitic substrates. 415-610 m.	No. No suitable habitat present.
Long-styled sand-spurrey *Spergularia macrotheca var. longistyla*	1B.2	Moist coastal and inland habitat, often in alkaline and saline substrates.	No. No suitable habitat present.
Northern slender pondweed *Stuckenia filiformis ssp. alpina*	2B.2	Ponds.	No. No suitable habitat present.
Suisun Marsh aster *Symphyotrichum lentum*	1B.2	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with phragmites, scirpus, blackberry, typha, etc. 0-3 m.	No. No suitable habitat present.
Napa bluecurls *Trichostema ruygtii*	1B.2	Cismontane woodland, chaparral, valley and foothill grassland, vernal pools, lower montane coniferous forest. Often in open, sunny areas. Also has been found in vernal pools. 30-590 m.	Yes. Potential habitat present in project site where grassland and oak woodland habitats occur.
Saline clover *Trifolium hydrophilum*	1B.2	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0-300 m.	No. No suitable habitat present.

Oval-leaved viburnum *Viburnum ellipticum*	2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. 215-1,400 m.	Yes. Potential habitat present in project site where oak woodland habitats occur.
* Habitat requirements are derived from the CNDDB general and microhabitats unless otherwise noted. **Does not duplicate species already represented in the Biological Assessment.			

Appendix I

Confidential Cultural Resources Reports and NAHC Contact

Confidential Cultural Resources Information
Bound Separately*

*The Cultural Resources Information has been bound separately to protect potentially sensitive information about the location and nature of cultural resources.

Appendix J

EJ Screen Community Reports

EJSCREEN COMMUNITY REPORTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Scotts Valley Band of Pomo Indians
Fee-to-Trust and Casino Project

Solano County, CA

Requested By:

Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762
916.235.8224
www.acorn-env.com

Source: https://ejscreen.epa.gov/mapper/ejscreen_SOE.aspx
Date Accessed: June 2024

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Vallejo, CA

Tract: 06095250106
Population: 3,692
Area in square miles: 7.16

Dynamic map initially showing the user-selected area

COMMUNITY INFORMATION

Low income: 14 percent

People of color: 76 percent

Less than high school education: 6 percent

Limited English households: 2 percent

Unemployment: 6 percent

Persons with disabilities: 9 percent

Male: 51 percent

Female: 49 percent

85 years
Average life expectancy

$47,442
Per capita income

Number of households: 1,093

Owner occupied: 94 percent

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	65%
Spanish	5%
Other Indo-European	1%
Chinese (including Mandarin, Cantonese)	3%
Vietnamese	5%
Tagalog (including Filipino)	19%
Other Asian and Pacific Island	1%
Arabic	1%
Total Non-English	35%

BREAKDOWN BY RACE

White: 24%

Black: 9%

American Indian: 0%

Asian: 48%

Hawaiian/Pacific Islander: 0%

Other race: 1%

Two or more races: 6%

Hispanic: 13%

BREAKDOWN BY AGE

From Ages 1 to 4	4%
From Ages 1 to 18	16%
From Ages 18 and up	84%
From Ages 65 and up	20%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	47%
Speak Asian-Pacific Island Languages	53%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

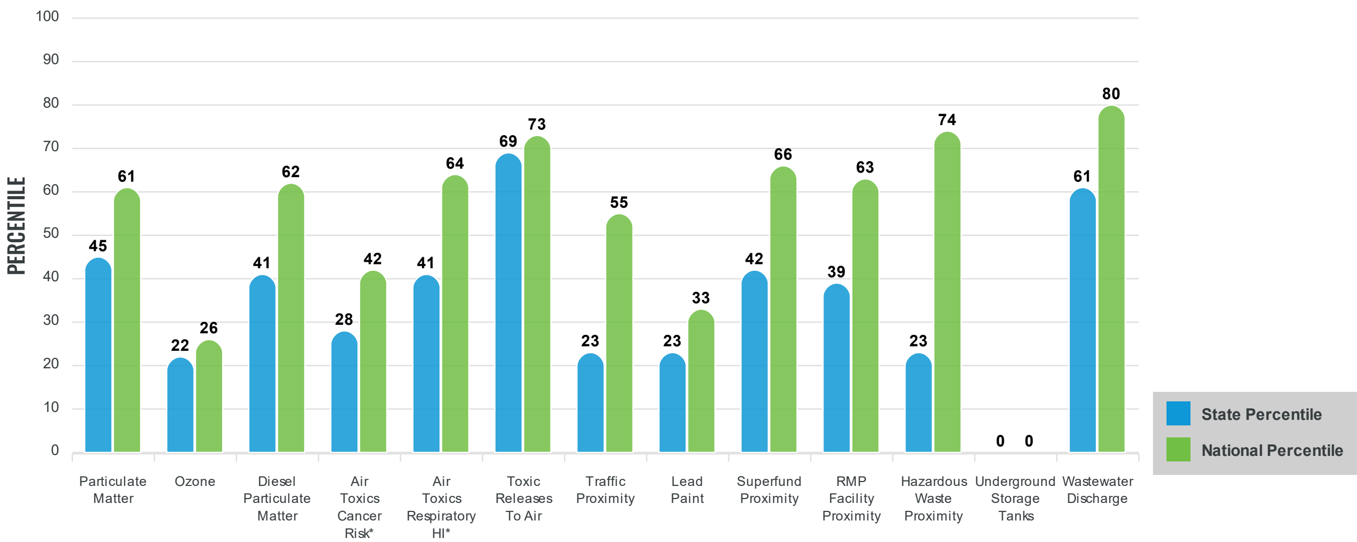
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

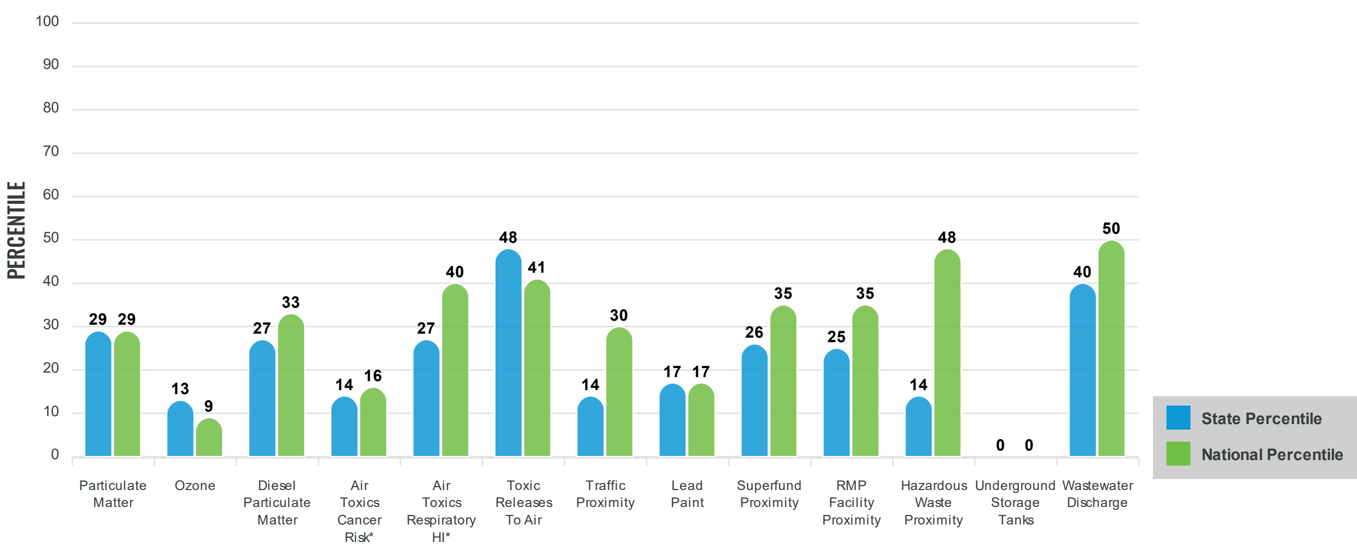
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095250106

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.72	8.65	35	8.08	37
Ozone (ppb)	55.7	65.9	15	61.6	11
Diesel Particulate Matter ($\mu g/m^3$)	0.182	0.26	33	0.261	40
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	740	780	68	4,600	53
Traffic Proximity (daily traffic count/distance to road)	39	510	16	210	35
Lead Paint (% Pre-1960 Housing)	0.012	0.31	17	0.3	16
Superfund Proximity (site count/km distance)	0.052	0.17	32	0.13	44
RMP Facility Proximity (facility count/km distance)	0.14	0.57	30	0.43	42
Hazardous Waste Proximity (facility count/km distance)	1.1	5.9	15	1.9	62
Underground Storage Tanks (count/km^2)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.045	4	60	22	78
SOCIOECONOMIC INDICATORS					
Demographic Index	45%	45%	52	35%	70
Supplemental Demographic Index	8%	15%	21	14%	22
People of Color	76%	61%	63	39%	81
Low Income	14%	28%	30	31%	26
Unemployment Rate	6%	7%	53	6%	62
Limited English Speaking Households	2%	9%	32	5%	61
Less Than High School Education	6%	16%	35	12%	41
Under Age 5	4%	6%	35	6%	37
Over Age 64	20%	16%	74	17%	68
Low Life Expectancy	13%	18%	8	20%	4

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 1
Air Pollution 0
Brownfields 1
Toxic Release Inventory 1

Other community features within defined area:

Schools 1
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment . . . . Yes
Impaired Waters . . . . Yes

Selected location contains American Indian Reservation Lands* . . . . No
Selected location contains a "Justice40 (CEJST)" disadvantaged community . . . . No
Selected location contains an EPA IRA disadvantaged community . . . . No

Report for Tract: 06095250106

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	13%	18%	8	20%	4
Heart Disease	3.9	5.2	16	6.1	10
Asthma	8.2	9.5	13	10	8
Cancer	4.6	5.3	40	6.1	19
Persons with Disabilities	9.2%	10.9%	40	13.4%	26

CLIMATE INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	3%	13%	38	12%	30
Wildfire Risk	91%	30%	77	14%	91

CRITICAL SERVICE GAPS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	2%	10%	20	14%	14
Lack of Health Insurance	3%	7%	26	9%	22
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095250106

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

American Canyon, CA

Tract: 06055201003
Population: 4,846
Area in square miles: 27.98

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	55%
Spanish	15%
Other Indo-European	5%
Chinese (including Mandarin, Cantonese)	1%
Vietnamese	1%
Tagalog (including Filipino)	22%
Other Asian and Pacific Island	1%
Total Non-English	45%

COMMUNITY INFORMATION

Low income: 12 percent

People of color: 85 percent

Less than high school education: 12 percent

Limited English households: 7 percent

Unemployment: 3 percent

Persons with disabilities: 11 percent

Male: 47 percent

Female: 53 percent

82 years
Average life expectancy

$48,487
Per capita income

Number of households: 1,321

Owner occupied: 67 percent

BREAKDOWN BY RACE

White: 15%

Black: 13%

American Indian: 0%

Asian: 44%

Hawaiian/Pacific Islander: 0%

Other race: 0%

Two or more races: 10%

Hispanic: 17%

BREAKDOWN BY AGE

From Ages 1 to 4	5%
From Ages 1 to 18	26%
From Ages 18 and up	74%
From Ages 65 and up	13%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	76%
Speak Other Indo-European Languages	15%
Speak Asian-Pacific Island Languages	9%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

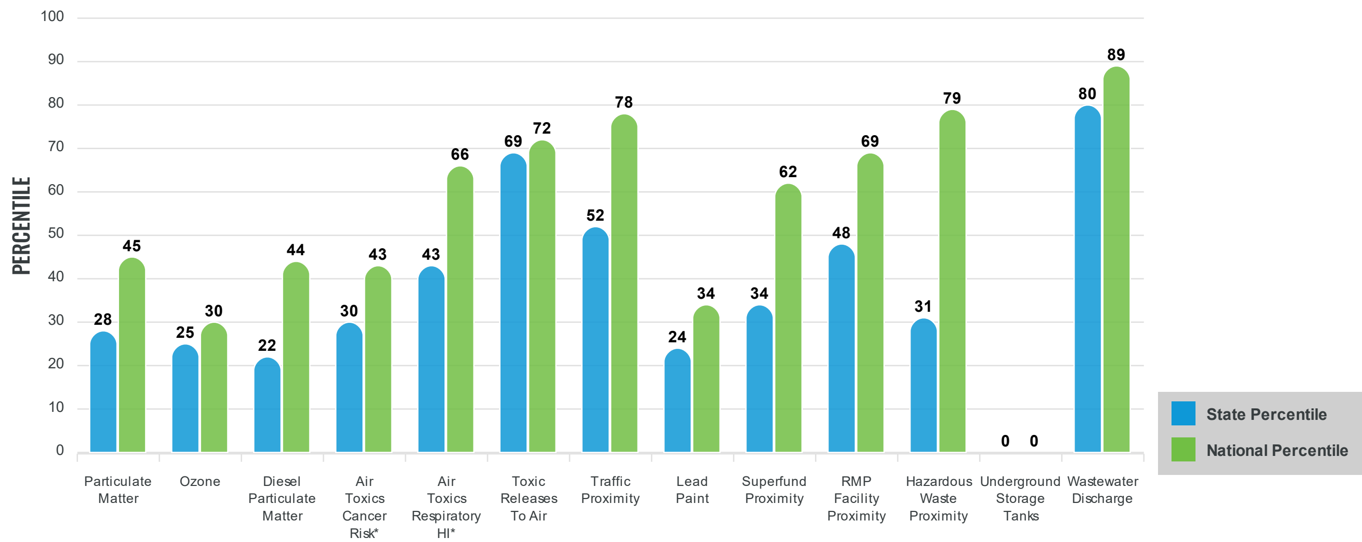
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

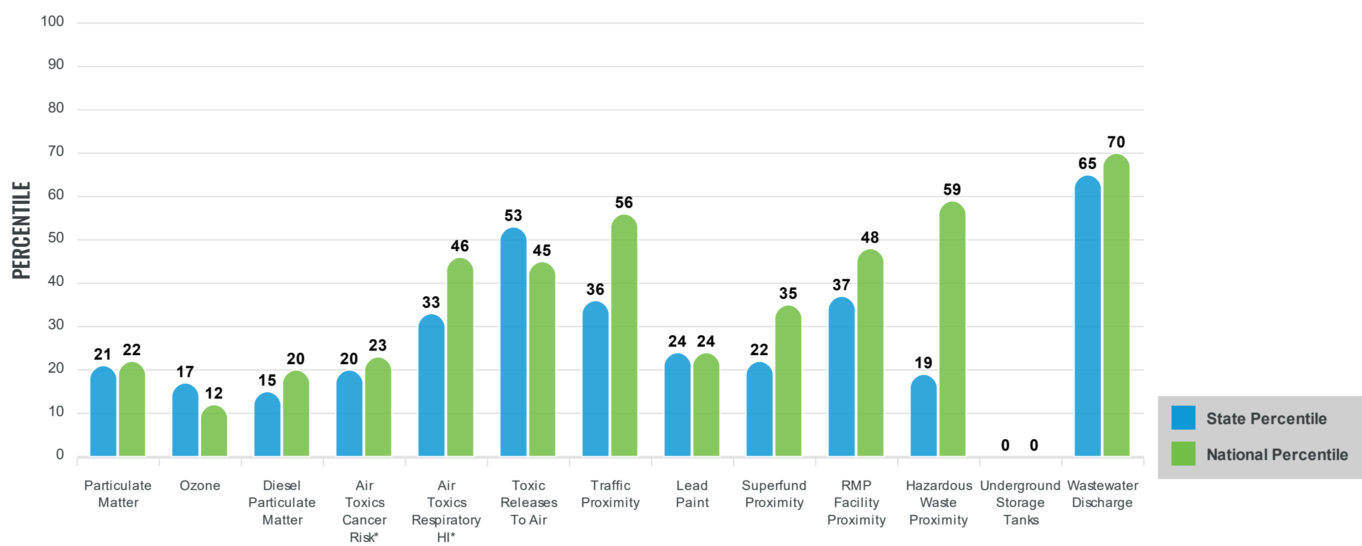
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06055201003

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.05	8.65	19	8.08	21
Ozone (ppb)	55.9	65.9	16	61.6	12
Diesel Particulate Matter ($\mu g/m^3$)	0.112	0.26	14	0.261	20
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	540	780	62	4,600	48
Traffic Proximity (daily traffic count/distance to road)	150	510	42	210	68
Lead Paint (% Pre-1960 Housing)	0.074	0.31	32	0.3	31
Superfund Proximity (site count/km distance)	0.039	0.17	23	0.13	35
RMP Facility Proximity (facility count/km distance)	0.17	0.57	39	0.43	49
Hazardous Waste Proximity (facility count/km distance)	1.6	5.9	21	1.9	69
Underground Storage Tanks (count/km^2)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.7	4	82	22	90
SOCIOECONOMIC INDICATORS					
Demographic Index	49%	45%	57	35%	73
Supplemental Demographic Index	10%	15%	34	14%	35
People of Color	85%	61%	74	39%	86
Low Income	12%	28%	25	31%	21
Unemployment Rate	3%	7%	32	6%	42
Limited English Speaking Households	7%	9%	60	5%	81
Less Than High School Education	12%	16%	54	12%	65
Under Age 5	5%	6%	46	6%	48
Over Age 64	13%	16%	49	17%	41
Low Life Expectancy	15%	18%	26	20%	14

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 1
Water Dischargers 11
Air Pollution 1
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 2
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment . . . . Yes
Impaired Waters . . . . No

Selected location contains American Indian Reservation Lands* . . . . No
Selected location contains a "Justice40 (CEJST)" disadvantaged community . . . . No
Selected location contains an EPA IRA disadvantaged community . . . . No

Report for Tract: 06055201003

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	15%	18%	26	20%	14
Heart Disease	3.7	5.2	12	6.1	8
Asthma	8.3	9.5	14	10	10
Cancer	4.1	5.3	27	6.1	12
Persons with Disabilities	10.8%	10.9%	56	13.4%	38

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	6%	13%	52	12%	49
Wildfire Risk	91%	30%	76	14%	91

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	9%	10%	55	14%	41
Lack of Health Insurance	4%	7%	29	9%	24
Housing Burden	Yes	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06055201003

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Fairfield, CA

Tract: 06095252206
Population: 5,992
Area in square miles: 7.13

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	71%
Spanish	10%
French, Haitian, or Cajun	1%
Other Indo-European	6%
Korean	1%
Chinese (including Mandarin, Cantonese)	3%
Tagalog (including Filipino)	8%
Other Asian and Pacific Island	1%
Total Non-English	29%

COMMUNITY INFORMATION

Low income: 13 percent

People of color: 75 percent

Less than high school education: 7 percent

Limited English households: 7 percent

Unemployment: 9 percent

Persons with disabilities: 12 percent

Male: 52 percent

Female: 48 percent

81 years
Average life expectancy

$43,334
Per capita income

Number of households: 1,830

Owner occupied: 82 percent

BREAKDOWN BY RACE

White: 25%

Black: 6%

American Indian: 3%

Asian: 28%

Hawaiian/Pacific Islander: 0%

Other race: 0%

Two or more races: 13%

Hispanic: 26%

BREAKDOWN BY AGE

From Ages 1 to 4	7%
From Ages 1 to 18	22%
From Ages 18 and up	78%
From Ages 65 and up	15%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	12%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	88%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

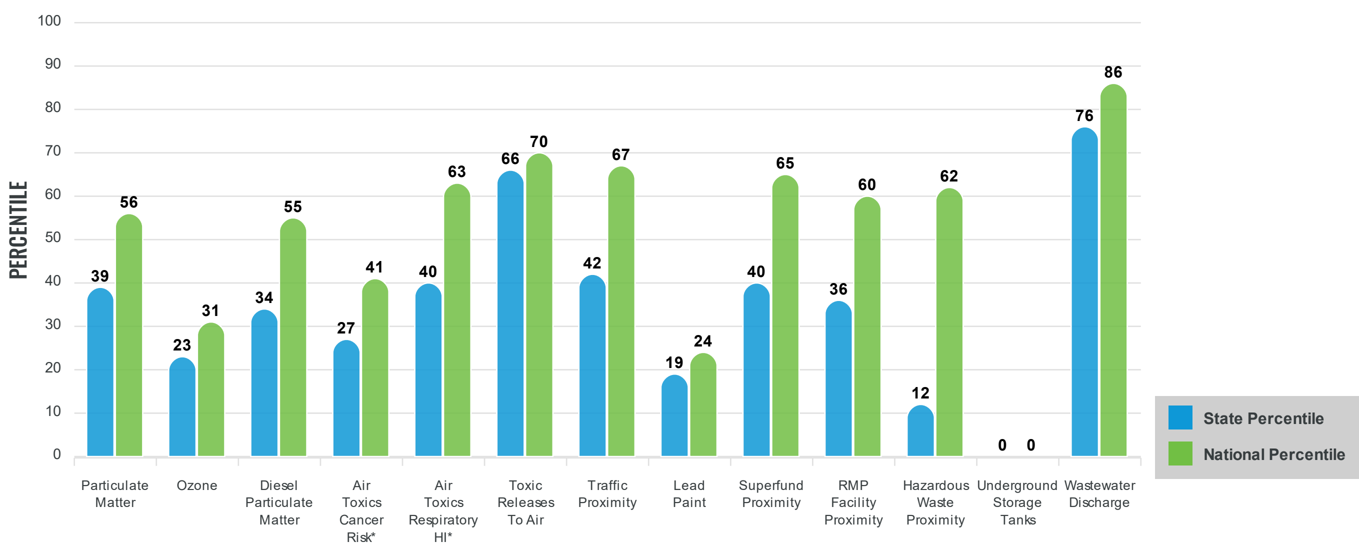
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

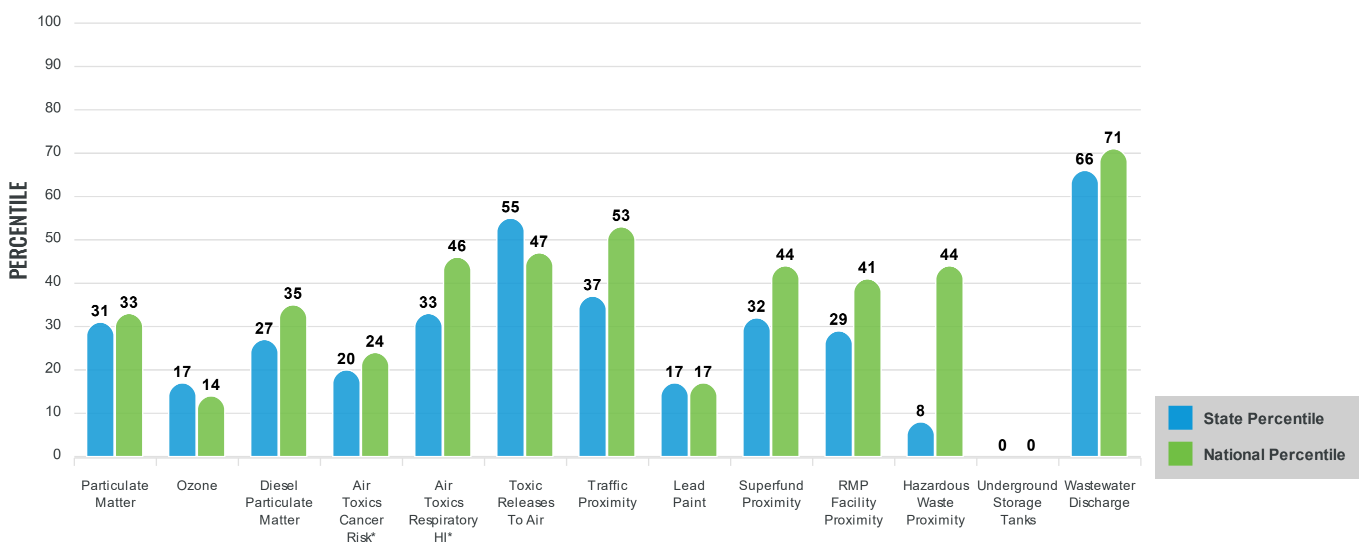
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095252206

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.53	8.65	30	8.08	33
Ozone (ppb)	56.2	65.9	16	61.6	14
Diesel Particulate Matter ($\mu g/m^3$)	0.158	0.26	26	0.261	33
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	600	780	64	4,600	49
Traffic Proximity (daily traffic count/distance to road)	180	510	47	210	71
Lead Paint (% Pre-1960 Housing)	0.018	0.31	19	0.3	18
Superfund Proximity (site count/km distance)	0.051	0.17	31	0.13	44
RMP Facility Proximity (facility count/km distance)	0.13	0.57	28	0.43	40
Hazardous Waste Proximity (facility count/km distance)	0.31	5.9	7	1.9	43
Underground Storage Tanks (count/km^2)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	2.8	4	90	22	94
SOCIOECONOMIC INDICATORS					
Demographic Index	44%	45%	50	35%	68
Supplemental Demographic Index	10%	15%	35	14%	37
People of Color	75%	61%	61	39%	80
Low Income	13%	28%	28	31%	24
Unemployment Rate	9%	7%	72	6%	77
Limited English Speaking Households	7%	9%	60	5%	81
Less Than High School Education	7%	16%	38	12%	45
Under Age 5	7%	6%	69	6%	70
Over Age 64	15%	16%	55	17%	46
Low Life Expectancy	17%	18%	39	20%	23

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 3
Air Pollution 0
Brownfields 0
Toxic Release Inventory 2

Other community features within defined area:

Schools 2
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment .... Yes
Impaired Waters .... No

Selected location contains American Indian Reservation Lands* .... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community .... No
Selected location contains an EPA IRA disadvantaged community .... No

Report for Tract: 06095252206

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	17%	18%	39	20%	23
Heart Disease	3.6	5.2	11	6.1	7
Asthma	9.1	9.5	37	10	27
Cancer	4.3	5.3	32	6.1	15
Persons with Disabilities	10.8%	10.9%	56	13.4%	37

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	9%	13%	60	12%	61
Wildfire Risk	91%	30%	77	14%	91

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	1%	10%	0	14%	12
Lack of Health Insurance	6%	7%	49	9%	42
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095252206

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Solano County, CA

Tract: 06095252205
Population: 7,807
Area in square miles: 13.82

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	64%
Spanish	10%
French, Haitian, or Cajun	1%
Other Indo-European	5%
Chinese (including Mandarin, Cantonese)	5%
Tagalog (including Filipino)	12%
Other Asian and Pacific Island	3%
Total Non-English	36%

COMMUNITY INFORMATION

Low income: 12 percent

People of color: 67 percent

Less than high school education: 4 percent

Limited English households: 4 percent

Unemployment: 4 percent

Persons with disabilities: 16 percent

Male: 56 percent

Female: 44 percent

81 years
Average life expectancy

$45,361
Per capita income

Number of households: 2,183

Owner occupied: 86 percent

BREAKDOWN BY RACE

White: 33%

Black: 10%

American Indian: 0%

Asian: 33%

Hawaiian/Pacific Islander: 0%

Other race: 0%

Two or more races: 7%

Hispanic: 17%

BREAKDOWN BY AGE

From Ages 1 to 4	8%
From Ages 1 to 18	28%
From Ages 18 and up	72%
From Ages 65 and up	14%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	63%
Speak Asian-Pacific Island Languages	37%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

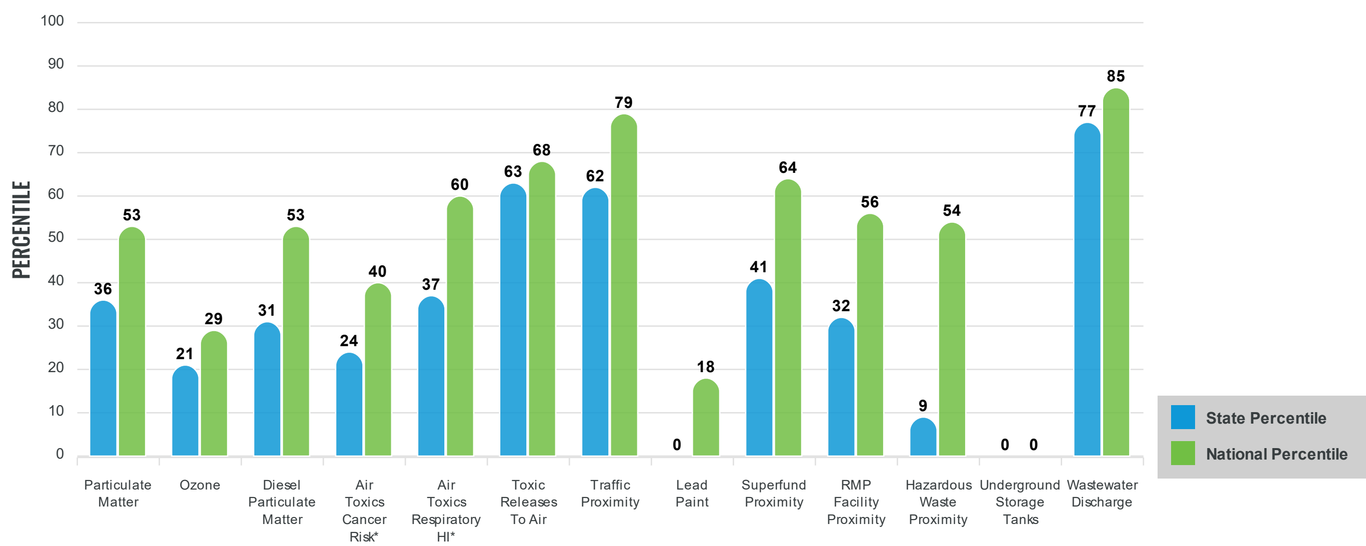
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

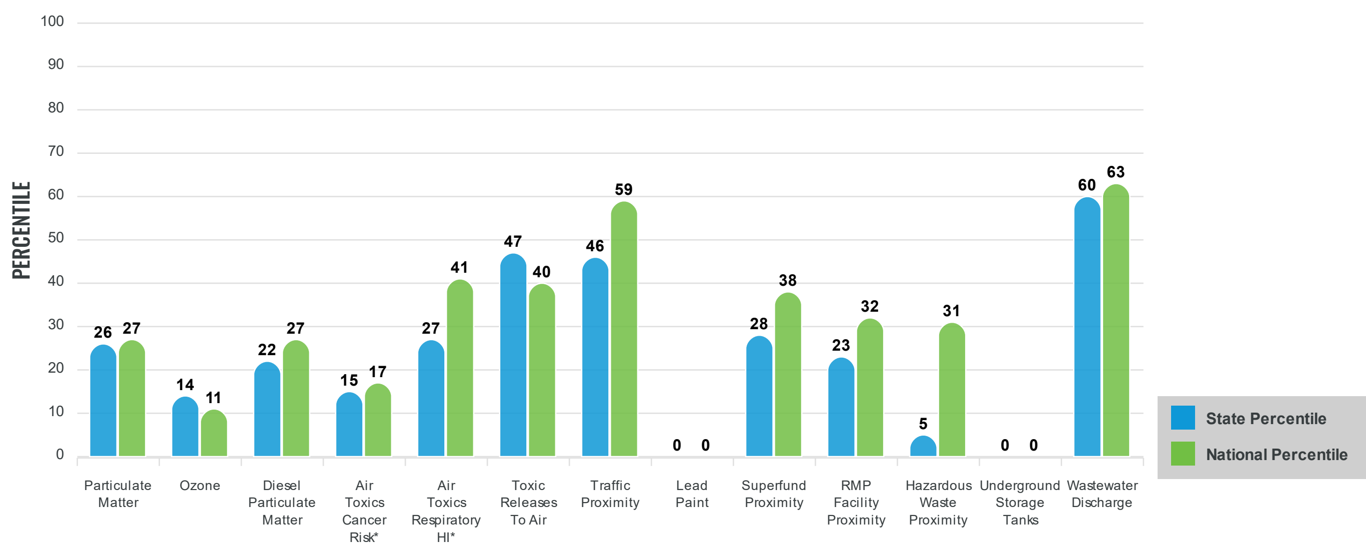
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095252205

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.53	8.65	30	8.08	33
Ozone (ppb)	56.2	65.9	16	61.6	14
Diesel Particulate Matter ($\mu g/m^3$)	0.158	0.26	26	0.261	33
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	650	780	66	4,600	51
Traffic Proximity (daily traffic count/distance to road)	370	510	68	210	86
Lead Paint (% Pre-1960 Housing)	0.0067	0.31	0	0.3	0
Superfund Proximity (site count/km distance)	0.056	0.17	35	0.13	47
RMP Facility Proximity (facility count/km distance)	0.12	0.57	26	0.43	38
Hazardous Waste Proximity (facility count/km distance)	0.22	5.9	6	1.9	37
Underground Storage Tanks (count/km^2)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	2.9	4	90	22	94
SOCIOECONOMIC INDICATORS					
Demographic Index	40%	45%	43	35%	64
Supplemental Demographic Index	8%	15%	22	14%	23
People of Color	67%	61%	54	39%	76
Low Income	12%	28%	26	31%	22
Unemployment Rate	4%	7%	37	6%	48
Limited English Speaking Households	4%	9%	45	5%	72
Less Than High School Education	4%	16%	26	12%	30
Under Age 5	8%	6%	77	6%	77
Over Age 64	14%	16%	53	17%	44
Low Life Expectancy	17%	18%	39	20%	23

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 1
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 2
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment . . . . Yes
Impaired Waters . . . . Yes

Selected location contains American Indian Reservation Lands* . . . . No
Selected location contains a "Justice40 (CEJST)" disadvantaged community . . . . . . No
Selected location contains an EPA IRA disadvantaged community . . . . No

Report for Tract: 06095252205

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	17%	18%	39	20%	23
Heart Disease	3.6	5.2	11	6.1	7
Asthma	9.1	9.5	37	10	27
Cancer	4.3	5.3	32	6.1	15
Persons with Disabilities	14.9%	10.9%	83	13.4%	65

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	11%	13%	66	12%	69
Wildfire Risk	83%	30%	74	14%	89

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	1%	10%	18	14%	13
Lack of Health Insurance	1%	7%	7	9%	5
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095252205

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Solano County, CA

Tract: 06095252102
Population: 4,274
Area in square miles: 30.26

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	84%
Spanish	9%
Other Indo-European	2%
Tagalog (including Filipino)	4%
Other Asian and Pacific Island	1%
Total Non-English	16%

COMMUNITY INFORMATION

Low income: 18 percent

People of color: 46 percent

Less than high school education: 9 percent

Limited English households: 2 percent

Unemployment: 6 percent

Persons with disabilities: 12 percent

Male: 52 percent

Female: 48 percent

79 years
Average life expectancy

$44,944
Per capita income

Number of households: 1,614

Owner occupied: 66 percent

BREAKDOWN BY RACE

White: 54%

Black: 3%

American Indian: 0%

Asian: 12%

Hawaiian/Pacific Islander: 1%

Other race: 0%

Two or more races: 11%

Hispanic: 19%

BREAKDOWN BY AGE

From Ages 1 to 4	14%
From Ages 1 to 18	27%
From Ages 18 and up	73%
From Ages 65 and up	16%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	39%
Speak Asian-Pacific Island Languages	61%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

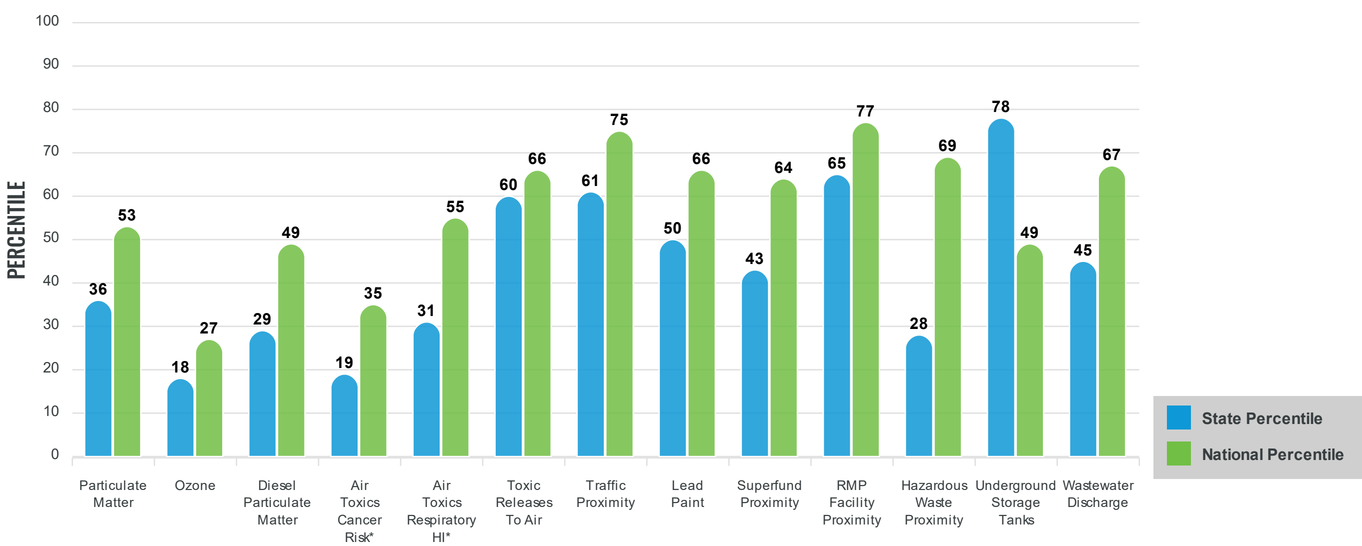
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

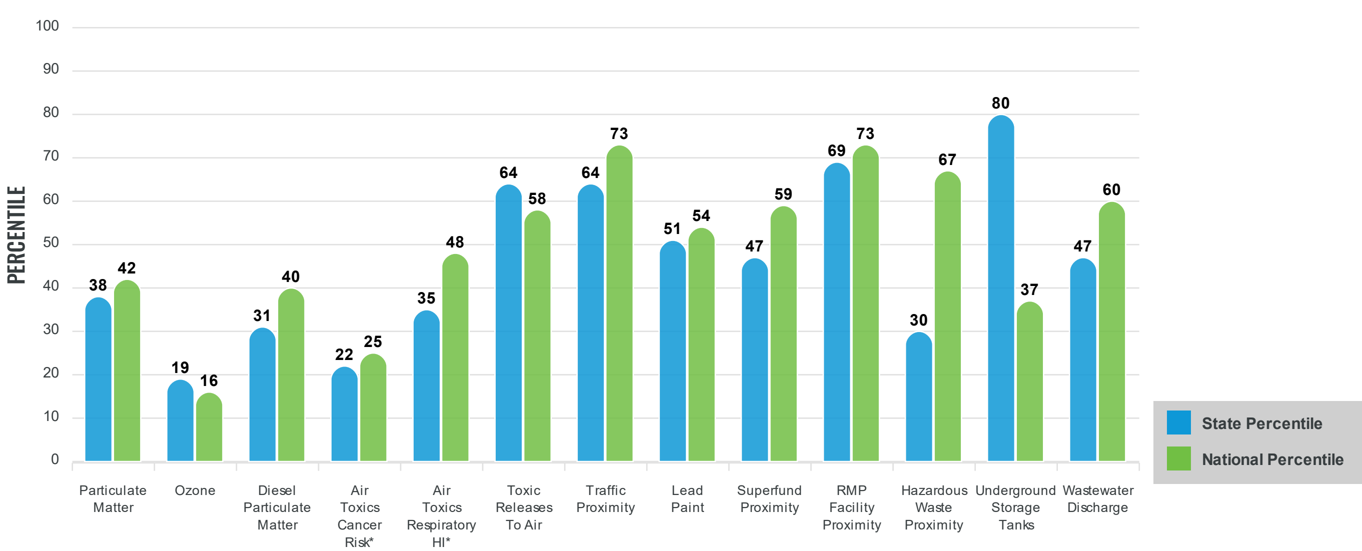
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095252102

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.84	8.65	37	8.08	41
Ozone (ppb)	56.7	65.9	17	61.6	16
Diesel Particulate Matter ($\mu g/m^3$)	0.167	0.26	29	0.261	36
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	1,200	780	79	4,600	63
Traffic Proximity (daily traffic count/distance to road)	620	510	79	210	92
Lead Paint (% Pre-1960 Housing)	0.34	0.31	59	0.3	61
Superfund Proximity (site count/km distance)	0.079	0.17	48	0.13	58
RMP Facility Proximity (facility count/km distance)	1.8	0.57	93	0.43	95
Hazardous Waste Proximity (facility count/km distance)	2.4	5.9	29	1.9	76
Underground Storage Tanks (count/km^2)	0.28	1.5	74	3.9	34
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0065	4	48	22	64
SOCIOECONOMIC INDICATORS					
Demographic Index	32%	45%	31	35%	54
Supplemental Demographic Index	11%	15%	38	14%	40
People of Color	46%	61%	32	39%	63
Low Income	18%	28%	39	31%	34
Unemployment Rate	6%	7%	55	6%	64
Limited English Speaking Households	2%	9%	33	5%	62
Less Than High School Education	9%	16%	45	12%	54
Under Age 5	14%	6%	95	6%	94
Over Age 64	16%	16%	61	17%	52
Low Life Expectancy	19%	18%	69	20%	49

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 5
Water Dischargers 44
Air Pollution 5
Brownfields 0
Toxic Release Inventory 7

Other community features within defined area:

Schools 1
Hospitals 0
Places of Worship 2

Other environmental data:

Air Non-attainment .... Yes
Impaired Waters .... Yes

Selected location contains American Indian Reservation Lands* .... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community .... No
Selected location contains an EPA IRA disadvantaged community .... No

Report for Tract: 06095252102

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	18%	69	20%	49
Heart Disease	5.1	5.2	52	6.1	31
Asthma	10	9.5	65	10	55
Cancer	6	5.3	69	6.1	45
Persons with Disabilities	10.8%	10.9%	56	13.4%	37

CLIMATE INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	11%	13%	66	12%	69
Wildfire Risk	2%	30%	62	14%	79

CRITICAL SERVICE GAPS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	5%	10%	40	14%	28
Lack of Health Insurance	1%	7%	9	9%	7
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095252102

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Benicia, CA

Tract: 06095252104
Population: 5,716
Area in square miles: 3.94

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	77%
Spanish	7%
Russian, Polish, or Other Slavic	1%
Other Indo-European	1%
Chinese (including Mandarin, Cantonese)	4%
Vietnamese	1%
Tagalog (including Filipino)	6%
Other Asian and Pacific Island	2%
Arabic	1%
Total Non-English	23%

COMMUNITY INFORMATION

Low income: 9 percent

People of color: 52 percent

Less than high school education: 5 percent

Limited English households: 1 percent

Unemployment: 4 percent

Persons with disabilities: 10 percent

Male: 52 percent

Female: 48 percent

82 years
Average life expectancy

$60,170
Per capita income

Number of households: 1,802

Owner occupied: 88 percent

BREAKDOWN BY RACE

White: 48%

Black: 7%

American Indian: 0%

Asian: 23%

Hawaiian/Pacific Islander: 1%

Other race: 0%

Two or more races: 8%

Hispanic: 13%

BREAKDOWN BY AGE

From Ages 1 to 4	7%
From Ages 1 to 18	25%
From Ages 18 and up	75%
From Ages 65 and up	14%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	27%
Speak Asian-Pacific Island Languages	73%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

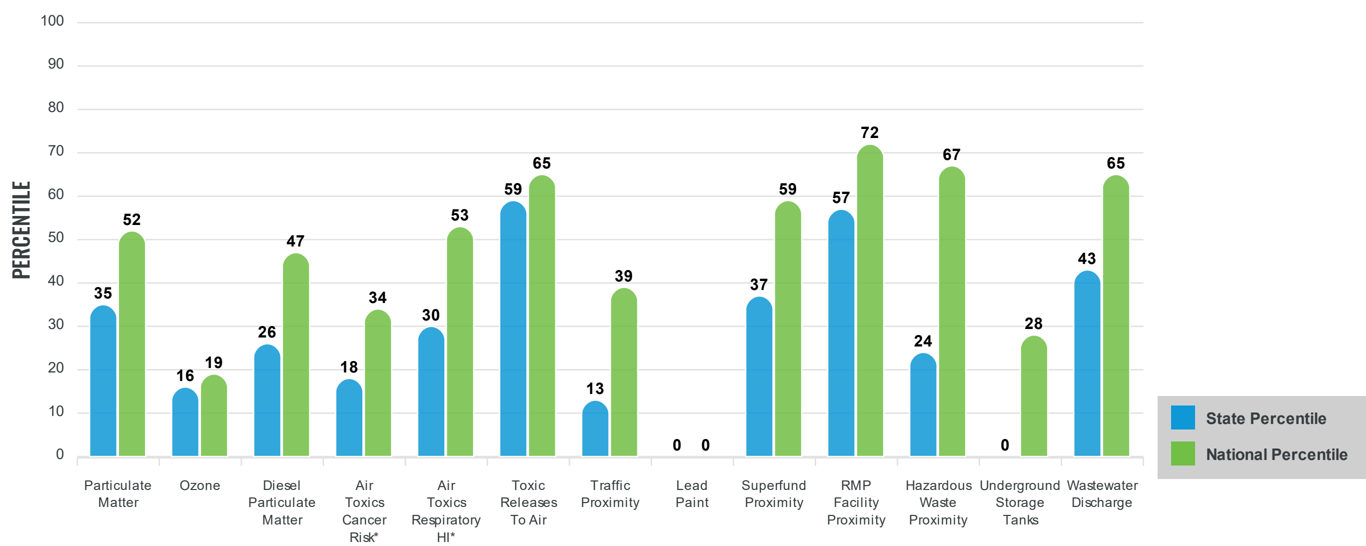
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

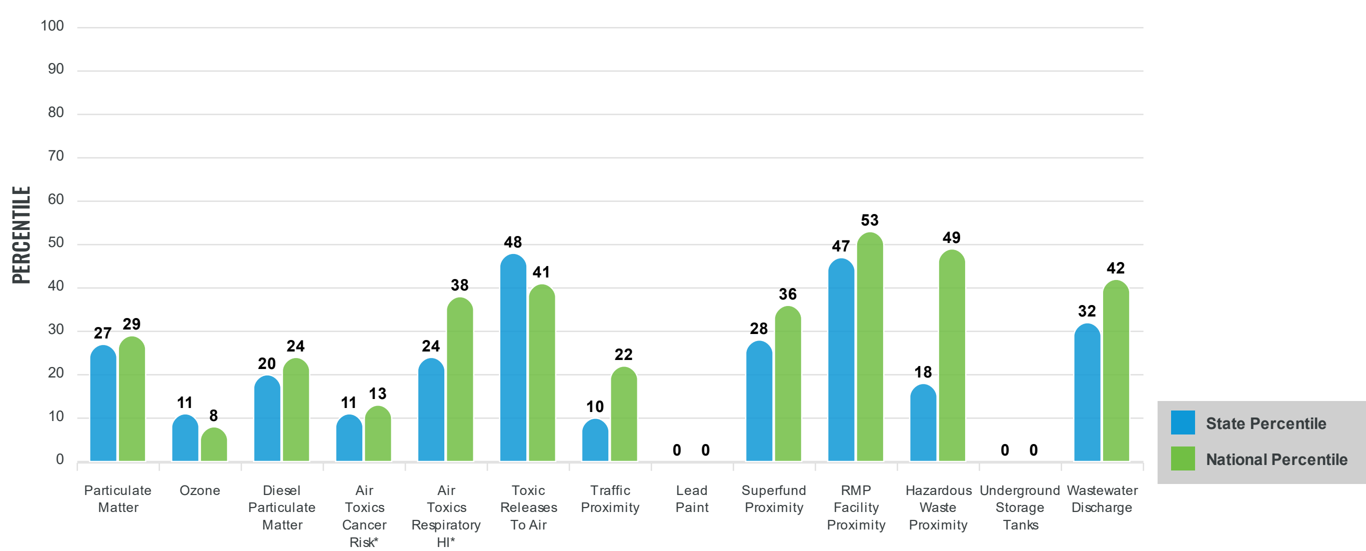
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095252104

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.9	8.65	38	8.08	42
Ozone (ppb)	55.7	65.9	15	61.6	11
Diesel Particulate Matter ($\mu g/m^3$)	0.162	0.26	27	0.261	35
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	1,300	780	80	4,600	64
Traffic Proximity (daily traffic count/distance to road)	32	510	13	210	31
Lead Paint (% Pre-1960 Housing)	0.0033	0.31	0	0.3	0
Superfund Proximity (site count/km distance)	0.065	0.17	40	0.13	52
RMP Facility Proximity (facility count/km distance)	1	0.57	84	0.43	88
Hazardous Waste Proximity (facility count/km distance)	2	5.9	26	1.9	74
Underground Storage Tanks (count/km^2)	0.24	1.5	74	3.9	33
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0069	4	49	22	64
SOCIOECONOMIC INDICATORS					
Demographic Index	31%	45%	29	35%	52
Supplemental Demographic Index	7%	15%	15	14%	16
People of Color	52%	61%	38	39%	67
Low Income	9%	28%	18	31%	15
Unemployment Rate	4%	7%	36	6%	47
Limited English Speaking Households	1%	9%	31	5%	61
Less Than High School Education	5%	16%	32	12%	37
Under Age 5	7%	6%	66	6%	67
Over Age 64	14%	16%	53	17%	44
Low Life Expectancy	16%	18%	29	20%	16

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund . . . 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities . . . 0
Water Dischargers . . . 4
Air Pollution . . . 0
Brownfields . . . 0
Toxic Release Inventory . . . 2

Other community features within defined area:

Schools . . . 1
Hospitals . . . 0
Places of Worship . . . 0

Other environmental data:

Air Non-attainment . . . Yes
Impaired Waters . . . Yes

Selected location contains American Indian Reservation Lands* . . . No
Selected location contains a "Justice40 (CEJST)" disadvantaged community . . . No
Selected location contains an EPA IRA disadvantaged community . . . No

Report for Tract: 06095252104

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	16%	18%	29	20%	16
Heart Disease	4	5.2	18	6.1	12
Asthma	9	9.5	34	10	25
Cancer	5.3	5.3	55	6.1	31
Persons with Disabilities	9.8%	10.9%	46	13.4%	30

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	5%	13%	46	12%	41
Wildfire Risk	99%	30%	85	14%	95

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	3%	10%	31	14%	22
Lack of Health Insurance	1%	7%	4	9%	3
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095252104

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Vallejo, CA

Tract: 06095252103
Population: 6,094
Area in square miles: 0.89

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	72%
Spanish	3%
Russian, Polish, or Other Slavic	1%
Other Indo-European	4%
Korean	1%
Chinese (including Mandarin, Cantonese)	3%
Vietnamese	1%
Tagalog (including Filipino)	13%
Other Asian and Pacific Island	2%
Arabic	1%
Total Non-English	28%

COMMUNITY INFORMATION

Low income: 19 percent
People of color: 77 percent
Less than high school education: 7 percent
Limited English households: 5 percent
Unemployment: 3 percent
Persons with disabilities: 12 percent
Male: 49 percent
Female: 51 percent
85 years Average life expectancy
$39,227 Per capita income
Number of households: 1,985
Owner occupied: 53 percent

BREAKDOWN BY RACE

White: 23%
Black: 19%
American Indian: 0%
Asian: 34%
Hawaiian/Pacific Islander: 0%
Other race: 6%
Two or more races: 11%
Hispanic: 7%

BREAKDOWN BY AGE

From Ages 1 to 4	5%
From Ages 1 to 18	15%
From Ages 18 and up	85%
From Ages 65 and up	20%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	10%
Speak Asian-Pacific Island Languages	90%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

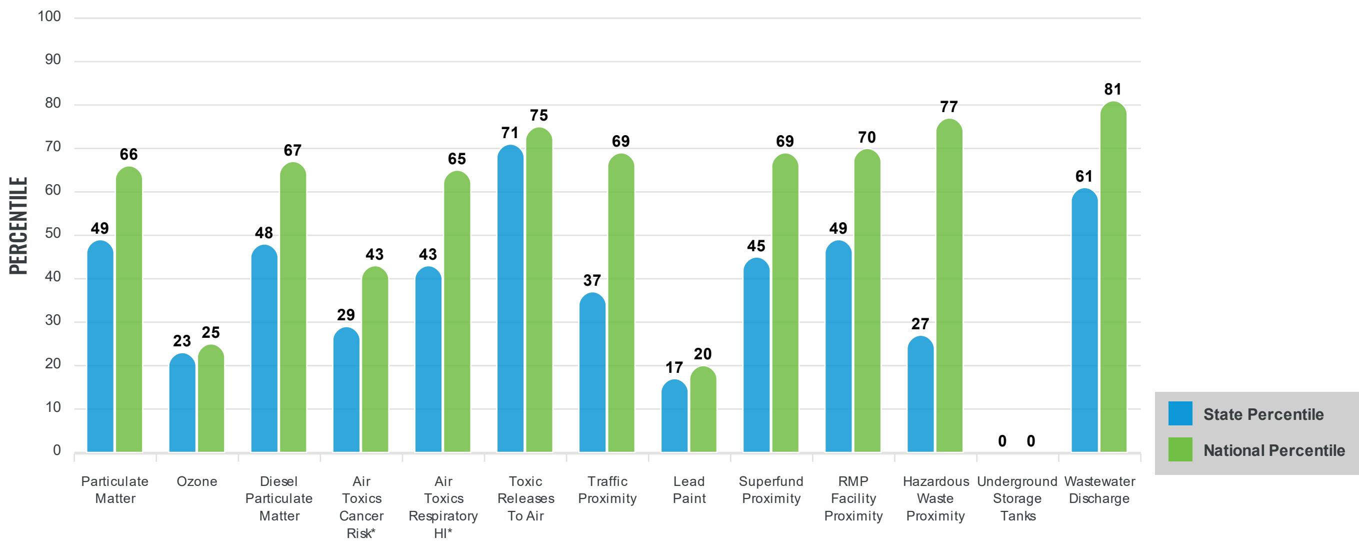
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

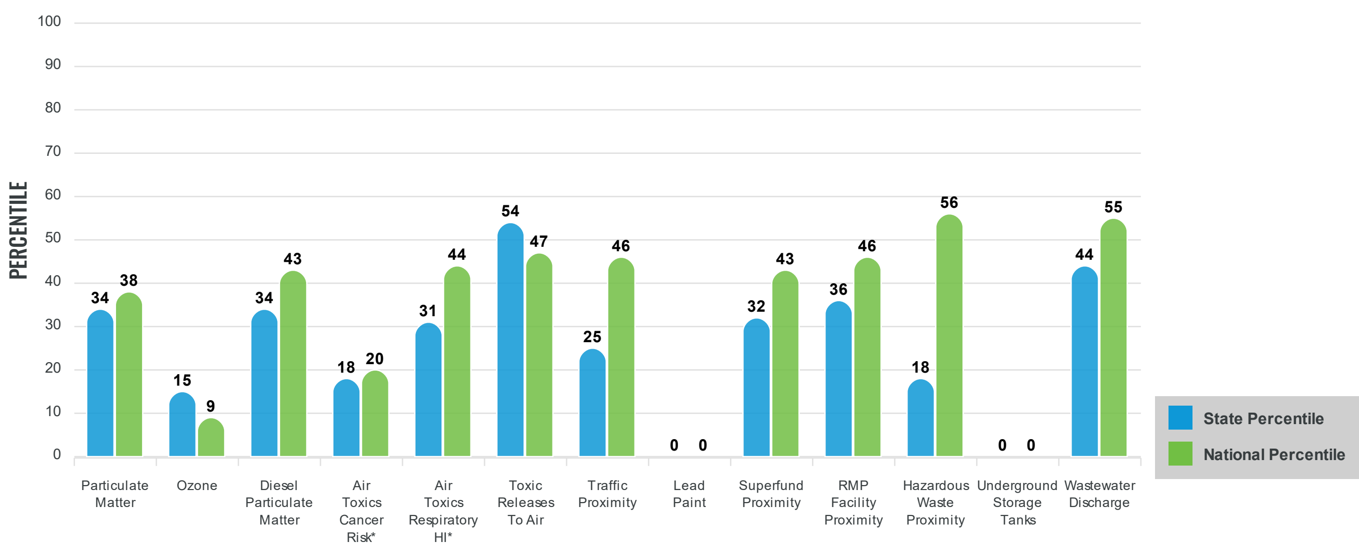
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095252103

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.88	8.65	37	8.08	42
Ozone (ppb)	55.4	65.9	15	61.6	10
Diesel Particulate Matter ($\mu g/m^3$)	0.198	0.26	38	0.261	45
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	740	780	68	4,600	53
Traffic Proximity (daily traffic count/distance to road)	90	510	29	210	54
Lead Paint (% Pre-1960 Housing)	0.01	0.31	16	0.3	16
Superfund Proximity (site count/km distance)	0.055	0.17	34	0.13	46
RMP Facility Proximity (facility count/km distance)	0.17	0.57	40	0.43	51
Hazardous Waste Proximity (facility count/km distance)	1.4	5.9	18	1.9	67
Underground Storage Tanks (count/km^2)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.01	4	51	22	67
SOCIOECONOMIC INDICATORS					
Demographic Index	48%	45%	56	35%	72
Supplemental Demographic Index	9%	15%	29	14%	30
People of Color	77%	61%	63	39%	81
Low Income	19%	28%	40	31%	35
Unemployment Rate	3%	7%	30	6%	41
Limited English Speaking Households	5%	9%	52	5%	76
Less Than High School Education	7%	16%	40	12%	48
Under Age 5	5%	6%	50	6%	52
Over Age 64	20%	16%	74	17%	69
Low Life Expectancy	13%	18%	8	20%	4

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 1
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment . . . . Yes
Impaired Waters . . . . No

Selected location contains American Indian Reservation Lands* . . . . No
Selected location contains a "Justice40 (CEJST)" disadvantaged community . . . . . . No
Selected location contains an EPA IRA disadvantaged community . . . . No

Report for Tract: 06095252103

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	13%	18%	8	20%	4
Heart Disease	4.6	5.2	36	6.1	21
Asthma	9.1	9.5	37	10	27
Cancer	4.7	5.3	42	6.1	21
Persons with Disabilities	12.1%	10.9%	68	13.4%	47

CLIMATE INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	1%	13%	28	12%	20
Wildfire Risk	80%	30%	73	14%	89

CRITICAL SERVICE GAPS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	3%	10%	27	14%	18
Lack of Health Insurance	1%	7%	8	9%	6
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095252103

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Vallejo, CA

Tract: 06095250104
Population: 2,135
Area in square miles: 0.51

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	77%
Spanish	4%
French, Haitian, or Cajun	1%
Chinese (including Mandarin, Cantonese)	1%
Tagalog (including Filipino)	16%
Other Asian and Pacific Island	1%
Total Non-English	23%

COMMUNITY INFORMATION

Low income: 19 percent

People of color: 73 percent

Less than high school education: 9 percent

Limited English households: 4 percent

Unemployment: 10 percent

Persons with disabilities: 19 percent

Male: 52 percent

Female: 48 percent

80 years
Average life expectancy

$39,020
Per capita income

Number of households: 740

Owner occupied: 50 percent

BREAKDOWN BY RACE

White: 27%

Black: 20%

American Indian: 0%

Asian: 33%

Hawaiian/Pacific Islander: 0%

Other race: 3%

Two or more races: 2%

Hispanic: 14%

BREAKDOWN BY AGE

From Ages 1 to 4	2%
From Ages 1 to 18	12%
From Ages 18 and up	88%
From Ages 65 and up	27%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	100%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

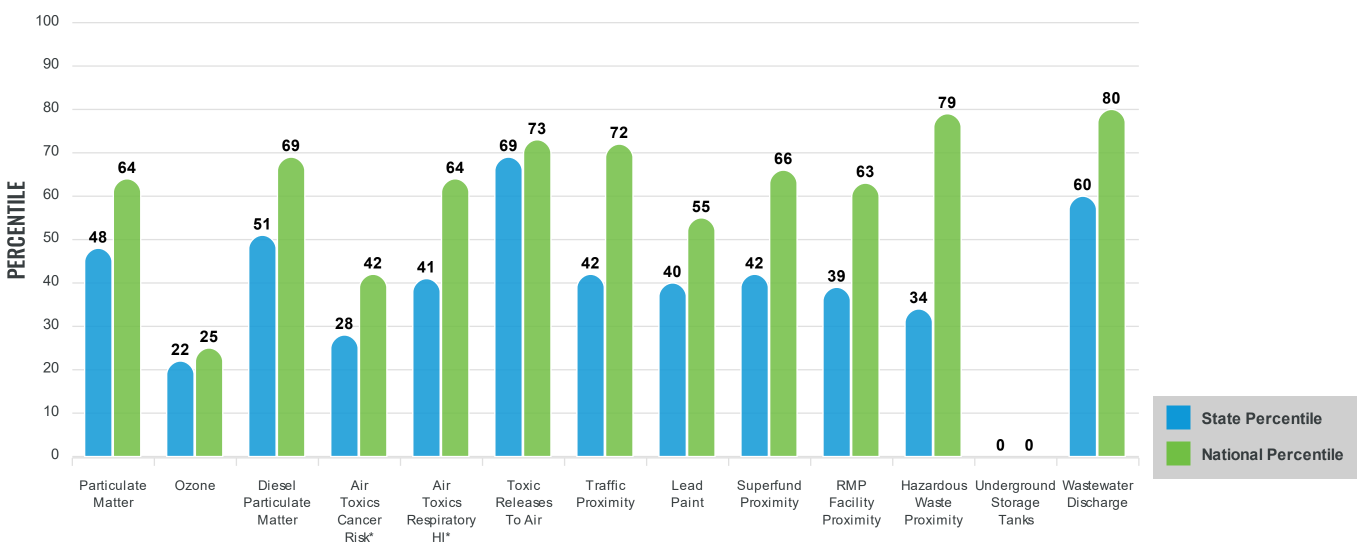
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

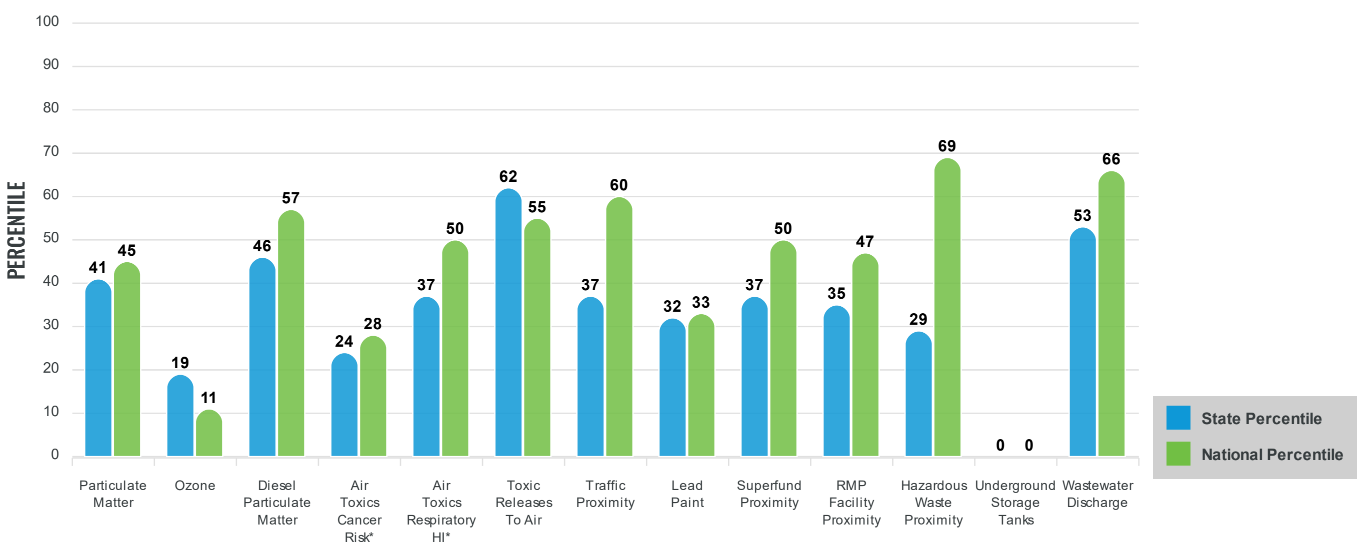
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095250104

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.85	8.65	37	8.08	41
Ozone (ppb)	55.4	65.9	15	61.6	10
Diesel Particulate Matter ($\mu g/m^3$)	0.22	0.26	44	0.261	51
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	680	780	67	4,600	52
Traffic Proximity (daily traffic count/distance to road)	110	510	34	210	59
Lead Paint (% Pre-1960 Housing)	0.092	0.31	34	0.3	34
Superfund Proximity (site count/km distance)	0.051	0.17	32	0.13	44
RMP Facility Proximity (facility count/km distance)	0.14	0.57	31	0.43	42
Hazardous Waste Proximity (facility count/km distance)	2	5.9	25	1.9	73
Underground Storage Tanks ($count/km^2$)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.011	4	52	22	68
SOCIOECONOMIC INDICATORS					
Demographic Index	46%	45%	53	35%	70
Supplemental Demographic Index	12%	15%	44	14%	46
People of Color	73%	61%	59	39%	79
Low Income	19%	28%	41	31%	35
Unemployment Rate	10%	7%	76	6%	80
Limited English Speaking Households	4%	9%	47	5%	73
Less Than High School Education	9%	16%	47	12%	56
Under Age 5	2%	6%	19	6%	21
Over Age 64	27%	16%	87	17%	84
Low Life Expectancy	18%	18%	59	20%	39

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 0
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 1
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment .... Yes
Impaired Waters .... Yes

Selected location contains American Indian Reservation Lands* .... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community .... No
Selected location contains an EPA IRA disadvantaged community .... No

Report for Tract: 06095250104

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	18%	18%	59	20%	39
Heart Disease	5.9	5.2	74	6.1	48
Asthma	8.4	9.5	16	10	11
Cancer	6.9	5.3	82	6.1	67
Persons with Disabilities	18.3%	10.9%	93	13.4%	80

CLIMATE INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	2%	13%	32	12%	24
Wildfire Risk	11%	30%	64	14%	81

CRITICAL SERVICE GAPS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	16%	10%	79	14%	65
Lack of Health Insurance	7%	7%	62	9%	54
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095250104

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Vallejo, CA

Tract: 06095250105
Population: 7,194
Area in square miles: 1.33

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	62%
Spanish	7%
Other Indo-European	1%
Chinese (including Mandarin, Cantonese)	2%
Tagalog (including Filipino)	26%
Other Asian and Pacific Island	2%
Total Non-English	38%

COMMUNITY INFORMATION

Low income: 16 percent

People of color: 83 percent

Less than high school education: 5 percent

Limited English households: 4 percent

Unemployment: 10 percent

Persons with disabilities: 9 percent

Male: 46 percent

Female: 54 percent

84 years
Average life expectancy

$42,662
Per capita income

Number of households: 2,561

Owner occupied: 60 percent

BREAKDOWN BY RACE

White: 17%

Black: 16%

American Indian: 1%

Asian: 49%

Hawaiian/Pacific Islander: 0%

Other race: 0%

Two or more races: 7%

Hispanic: 11%

BREAKDOWN BY AGE

From Ages 1 to 4	3%
From Ages 1 to 18	21%
From Ages 18 and up	79%
From Ages 65 and up	22%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	6%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	94%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

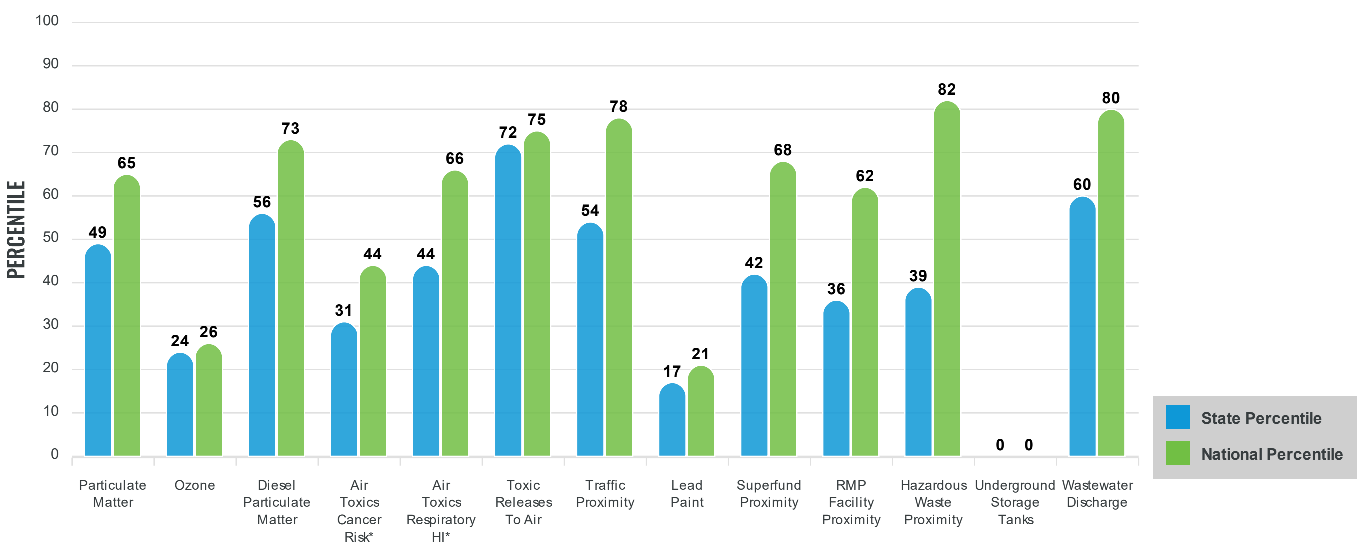
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

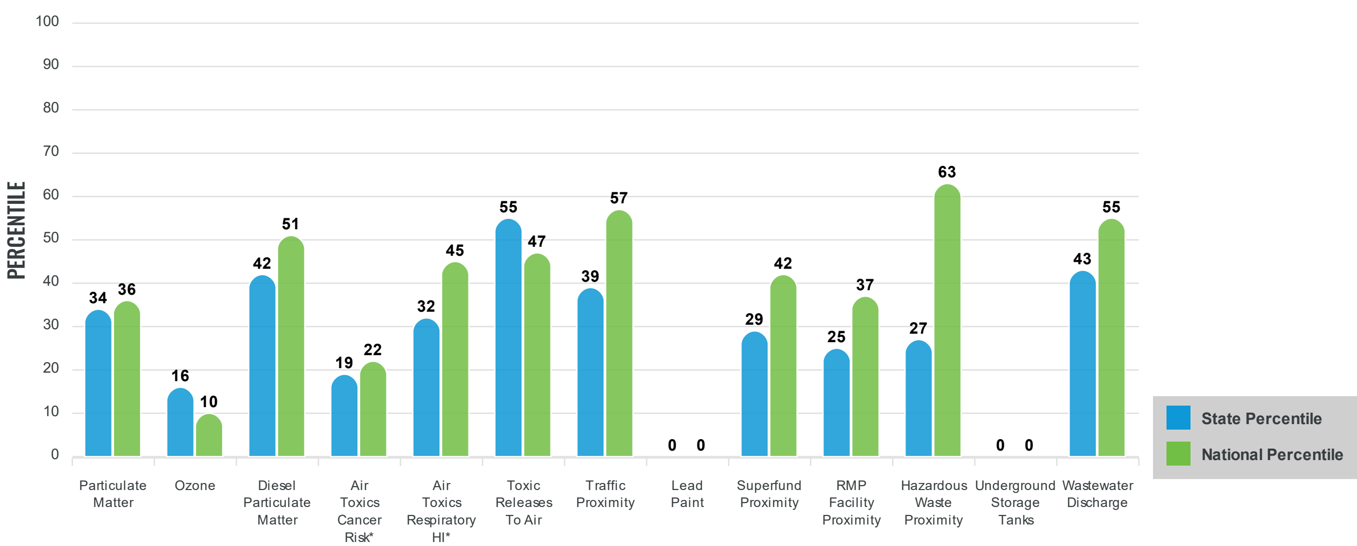
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095250105

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.74	8.65	35	8.08	38
Ozone (ppb)	55.5	65.9	15	61.6	10
Diesel Particulate Matter ($\mu g/m^3$)	0.23	0.26	46	0.261	53
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	660	780	66	4,600	51
Traffic Proximity (daily traffic count/distance to road)	220	510	53	210	76
Lead Paint (% Pre-1960 Housing)	0.012	0.31	16	0.3	16
Superfund Proximity (site count/km distance)	0.048	0.17	30	0.13	42
RMP Facility Proximity (facility count/km distance)	0.12	0.57	25	0.43	36
Hazardous Waste Proximity (facility count/km distance)	2.3	5.9	29	1.9	76
Underground Storage Tanks (count/km^2)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0059	4	48	22	63
SOCIOECONOMIC INDICATORS					
Demographic Index	50%	45%	59	35%	74
Supplemental Demographic Index	10%	15%	33	14%	34
People of Color	83%	61%	71	39%	85
Low Income	16%	28%	34	31%	30
Unemployment Rate	10%	7%	77	6%	80
Limited English Speaking Households	4%	9%	46	5%	72
Less Than High School Education	5%	16%	33	12%	38
Under Age 5	3%	6%	29	6%	31
Over Age 64	22%	16%	79	17%	74
Low Life Expectancy	14%	18%	17	20%	9

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 1
Water Dischargers 0
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment . . . . Yes
Impaired Waters . . . . Yes

Selected location contains American Indian Reservation Lands* . . . . No
Selected location contains a "Justice40 (CEJST)" disadvantaged community . . . . No
Selected location contains an EPA IRA disadvantaged community . . . . No

Report for Tract: 06095250105

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	14%	18%	17	20%	9
Heart Disease	3.9	5.2	16	6.1	10
Asthma	8.3	9.5	14	10	10
Cancer	4.2	5.3	29	6.1	14
Persons with Disabilities	8.5%	10.9%	33	13.4%	22

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	5%	13%	46	12%	40
Wildfire Risk	46%	30%	68	14%	85

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	3%	10%	31	14%	21
Lack of Health Insurance	2%	7%	10	9%	8
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095250105

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Vallejo, CA

Tract: 06095251901
Population: 5,682
Area in square miles: 1.32

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	56%
Spanish	22%
German or other West Germanic	1%
Other Indo-European	1%
Chinese (including Mandarin, Cantonese)	1%
Tagalog (including Filipino)	18%
Other Asian and Pacific Island	1%
Total Non-English	44%

COMMUNITY INFORMATION

Low income: 34 percent

People of color: 85 percent

Less than high school education: 14 percent

Limited English households: 8 percent

Unemployment: 10 percent

Persons with disabilities: 18 percent

Male: 52 percent

Female: 48 percent

78 years
Average life expectancy

$30,468
Per capita income

Number of households: 1,895

Owner occupied: 48 percent

BREAKDOWN BY RACE

White: 15%

Black: 23%

American Indian: 0%

Asian: 24%

Hawaiian/Pacific Islander: 0%

Other race: 0%

Two or more races: 4%

Hispanic: 33%

BREAKDOWN BY AGE

From Ages 1 to 4	4%
From Ages 1 to 18	22%
From Ages 18 and up	78%
From Ages 65 and up	21%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	35%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	65%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

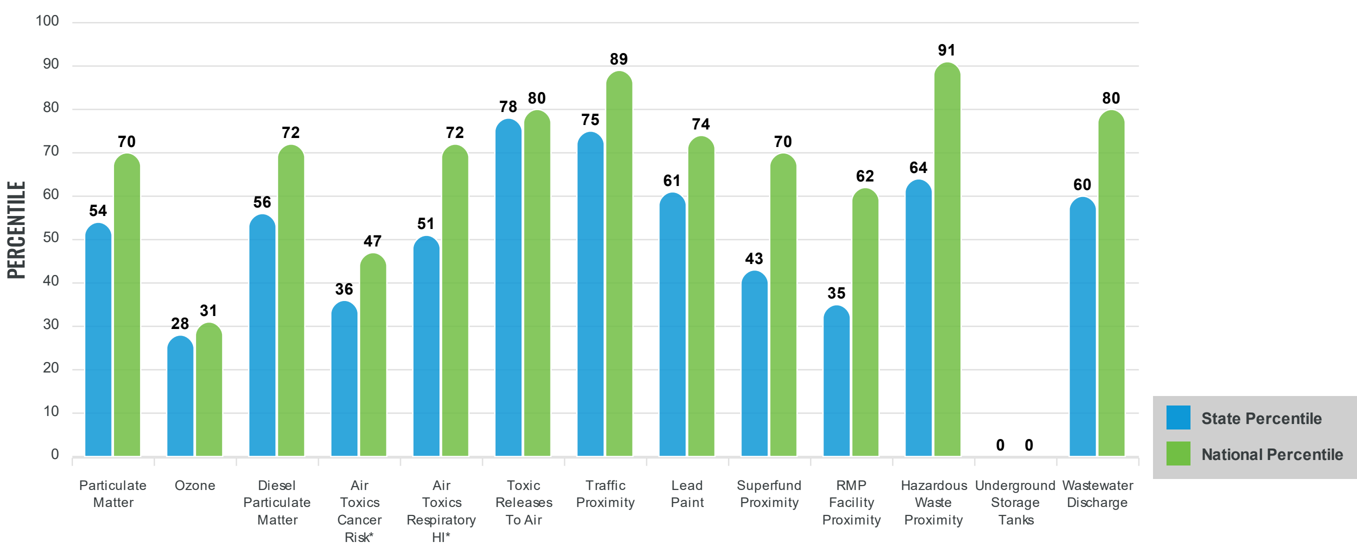
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

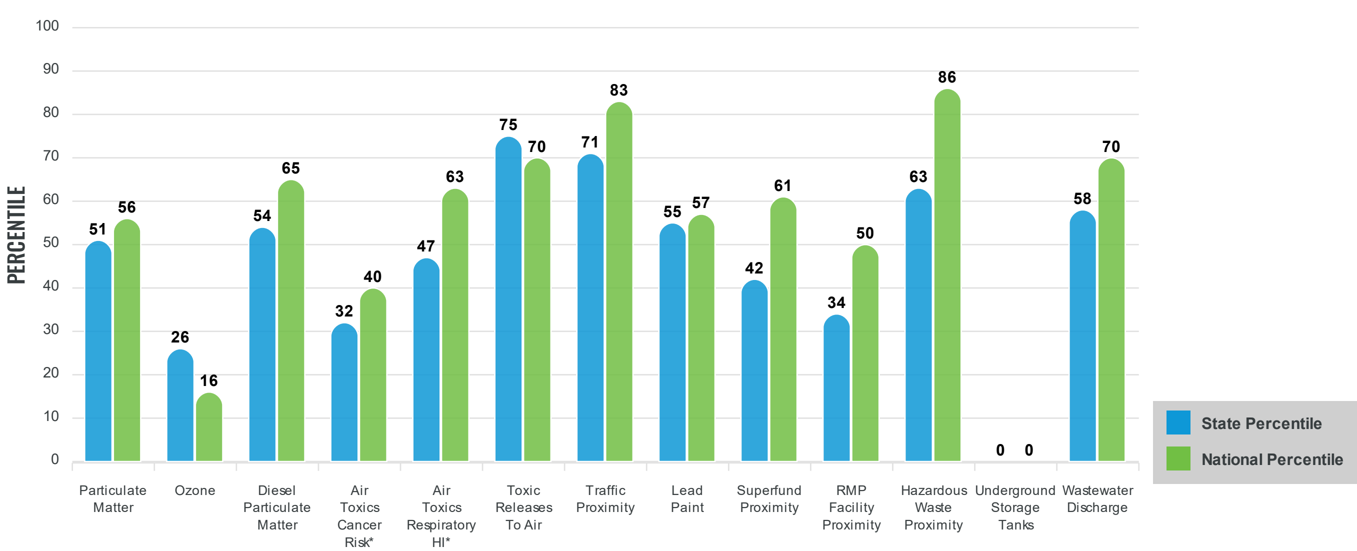
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095251901

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.68	8.65	34	8.08	37
Ozone (ppb)	55.3	65.9	15	61.6	10
Diesel Particulate Matter ($\mu g/m^3$)	0.197	0.26	38	0.261	44
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	610	780	64	4,600	50
Traffic Proximity (daily traffic count/distance to road)	310	510	64	210	83
Lead Paint (% Pre-1960 Housing)	0.15	0.31	42	0.3	43
Superfund Proximity (site count/km distance)	0.043	0.17	26	0.13	38
RMP Facility Proximity (facility count/km distance)	0.11	0.57	20	0.43	31
Hazardous Waste Proximity (facility count/km distance)	4.1	5.9	48	1.9	86
Underground Storage Tanks (count/km^2)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0015	4	40	22	52
SOCIOECONOMIC INDICATORS					
Demographic Index	60%	45%	75	35%	83
Supplemental Demographic Index	17%	15%	66	14%	71
People of Color	85%	61%	73	39%	86
Low Income	34%	28%	66	31%	62
Unemployment Rate	10%	7%	79	6%	82
Limited English Speaking Households	8%	9%	63	5%	82
Less Than High School Education	14%	16%	58	12%	70
Under Age 5	4%	6%	43	6%	46
Over Age 64	21%	16%	77	17%	71
Low Life Expectancy	20%	18%	78	20%	59

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 0
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 2
Hospitals 1
Places of Worship 0

Other environmental data:

Air Non-attainment .... Yes
Impaired Waters .... Yes

Selected location contains American Indian Reservation Lands* .... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community .... Yes
Selected location contains an EPA IRA disadvantaged community .... Yes

Report for Tract: 06095251901

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	20%	18%	78	20%	59
Heart Disease	6.4	5.2	83	6.1	58
Asthma	10.3	9.5	74	10	64
Cancer	6	5.3	69	6.1	45
Persons with Disabilities	18.1%	10.9%	92	13.4%	79

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	6%	13%	52	12%	49
Wildfire Risk	1%	30%	62	14%	78

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	14%	10%	74	14%	59
Lack of Health Insurance	8%	7%	67	9%	59
Housing Burden	Yes	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

Report for Tract: 06095251901

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Vallejo, CA

Tract: 06095251903
Population: 5,933
Area in square miles: 1.04

Dynamic map initially showing the user-selected area

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	60%
Spanish	18%
Other Indo-European	1%
Chinese (including Mandarin, Cantonese)	1%
Tagalog (including Filipino)	17%
Other Asian and Pacific Island	2%
Other and Unspecified	1%
Total Non-English	40%

COMMUNITY INFORMATION

Low income: 32 percent
People of color: 90 percent
Less than high school education: 15 percent
Limited English households: 5 percent
Unemployment: 12 percent
Persons with disabilities: 12 percent
Male: 50 percent
Female: 50 percent

76 years
Average life expectancy

$35,726
Per capita income

Number of households: 1,796

Owner occupied: 72 percent

BREAKDOWN BY RACE

White: 10%
Black: 24%
American Indian: 1%
Asian: 30%
Hawaiian/Pacific Islander: 4%
Other race: 2%
Two or more races: 5%
Hispanic: 23%

BREAKDOWN BY AGE

From Ages 1 to 4	6%
From Ages 1 to 18	25%
From Ages 18 and up	75%
From Ages 65 and up	16%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	32%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	68%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

Environmental Justice & Supplemental Indexes

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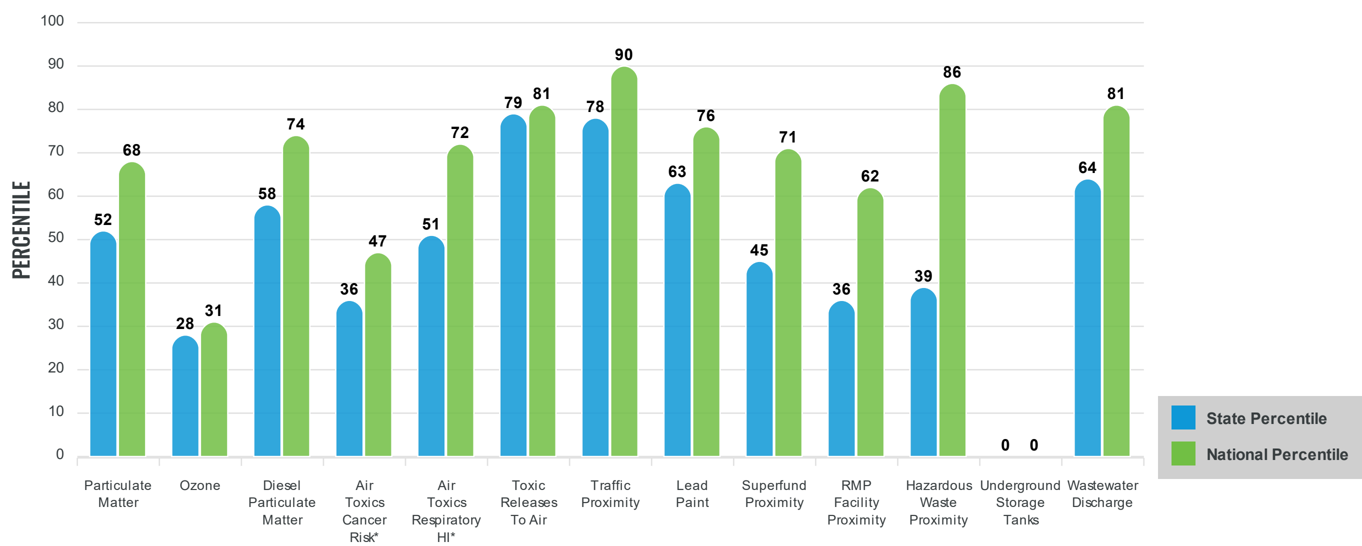

SUPPLEMENTAL INDEXES

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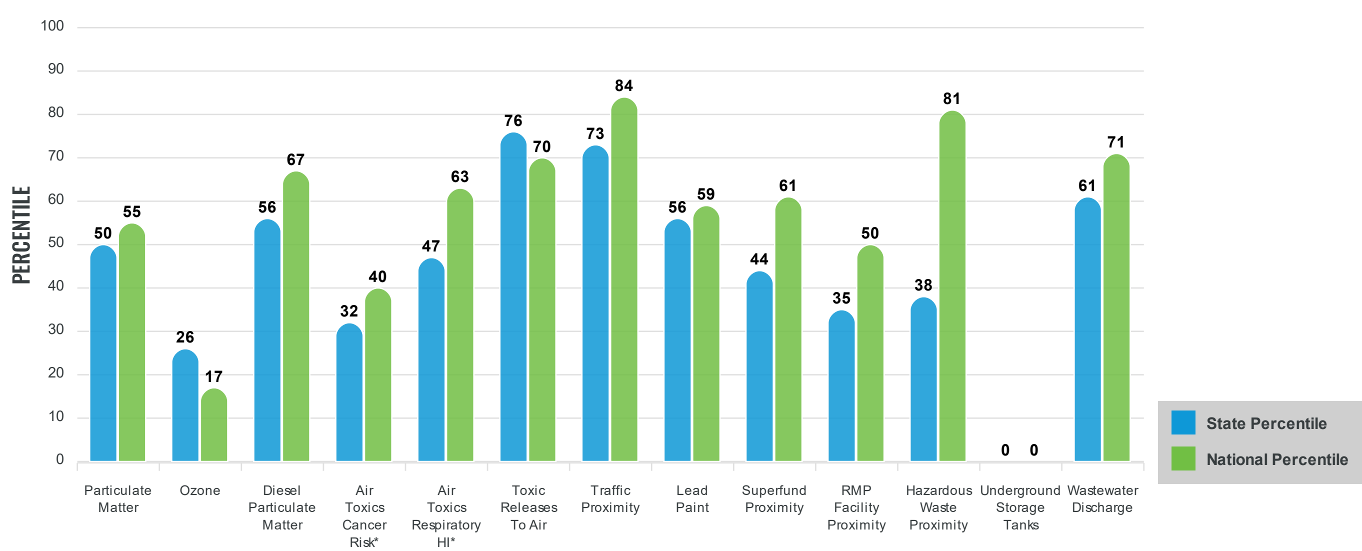

These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Tract: 06095251903

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	7.61	8.65	32	8.08	35
Ozone (ppb)	55.5	65.9	15	61.6	10
Diesel Particulate Matter ($\mu g/m^3$)	0.201	0.26	39	0.261	45
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	3	25	5
Air Toxics Respiratory HI*	0.3	0.34	17	0.31	31
Toxic Releases to Air	620	780	65	4,600	50
Traffic Proximity (daily traffic count/distance to road)	660	510	80	210	93
Lead Paint (% Pre-1960 Housing)	0.18	0.31	45	0.3	46
Superfund Proximity (site count/km distance)	0.044	0.17	26	0.13	39
RMP Facility Proximity (facility count/km distance)	0.11	0.57	20	0.43	31
Hazardous Waste Proximity (facility count/km distance)	1.8	5.9	23	1.9	71
Underground Storage Tanks (count/km^2)	0	1.5	0	3.9	0
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.024	4	57	22	74
SOCIOECONOMIC INDICATORS					
Demographic Index	61%	45%	76	35%	83
Supplemental Demographic Index	18%	15%	67	14%	71
People of Color	90%	61%	80	39%	88
Low Income	32%	28%	63	31%	59
Unemployment Rate	12%	7%	84	6%	86
Limited English Speaking Households	5%	9%	51	5%	75
Less Than High School Education	15%	16%	60	12%	72
Under Age 5	6%	6%	55	6%	57
Over Age 64	16%	16%	61	17%	53
Low Life Expectancy	22%	18%	87	20%	71

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 0
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment . . . . Yes
Impaired Waters . . . . No

Selected location contains American Indian Reservation Lands* . . . . No
Selected location contains a "Justice40 (CEJST)" disadvantaged community . . . . . . Yes
Selected location contains an EPA IRA disadvantaged community . . . . Yes

Report for Tract: 06095251903

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	22%	18%	87	20%	71
Heart Disease	5.2	5.2	56	6.1	33
Asthma	10.4	9.5	76	10	66
Cancer	4.8	5.3	44	6.1	22
Persons with Disabilities	11.3%	10.9%	61	13.4%	42

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	11%	13%	66	12%	68
Wildfire Risk	92%	30%	77	14%	91

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	8%	10%	54	14%	40
Lack of Health Insurance	6%	7%	54	9%	46
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Tract: 06095251903

Appendix K

Transportation Impact Analysis

Transportation Impact Analysis

Scotts Valley Development Project

City of Vallejo

Prepared by:
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Abrams Associates
TRAFFIC ENGINEERING, INC.

July 3, 2024

Table of Contents

Scotts Valley Development Project

City of Vallejo

TRANSPORTATION IMPACT ANALYSIS

1) INTRODUCTION

This transportation impact analysis describes the existing and future conditions for transportation with and without the proposed Scotts Valley Development Project in the City of Vallejo. The project would include a casino with restaurants, bars, and event space. It would also include Tribal housing, a Tribal administration building, and associated parking and infrastructure on the site. The site is currently vacant.

This study also describes the regulatory setting; the criterion used for determining the significance of environmental impacts; and summarizes potential environmental impacts and appropriate mitigation measures. This study has been conducted in accordance with the requirements and methodologies set forth by the City of Vallejo, Solano County, and Caltrans. This report has been prepared to assess off-reservation impacts of the project in accordance with Appendix B of the Tribe's Tribal-State Compact.

Summary of Required Mitigations and Recommended Improvement Measures - The following is a summary of the proposed mitigation measures to address the transportation impacts of the project. Based on a detailed analysis of traffic operations with and without each of the proposed mitigations, implementation of the following mitigation measures would reduce some of the project impacts to a *less-than-significant* level.

Impact #1 **Impacts to intersection operations - The project would contribute to LOS operations exceeding the established standards at the following intersection under future Friday conditions (Significant and Unavoidable):**

Auto Mall Parkway at Admiral Callaghan Lane (Intersection #1)

The addition of traffic from the proposed project would contribute to this intersection exceeding the established LOS standards. The proposed mitigation (MM 1) would be required for the anticipated 2028 opening of the project, and would also be required for a 2028 opening of the project under Alternative B. For Alternative C, no LOS or queuing impacts were identified for the existing and baseline scenarios. However, mitigation measure #1 would still be required to address queuing under Cumulative Plus Project conditions for Alternative C. The proposed mitigation measure would be forecast to sufficiently mitigate both the LOS and queuing to acceptable levels in all plus project scenarios.

Mitigation Measures

MM 1 *Auto Mall Parkway at Admiral Callaghan Lane and the Proposed Project Entrance – Widen Auto Mall Parkway to provide for a dual eastbound left turn movement. At this intersection a right turn overlap phase (i.e., a green arrow for southbound traffic turning right out of the site towards I-80) would also be required for traffic to exit the site efficiently. This mitigation is required for all alternatives except for Alternative C, where it is only required for cumulative plus project conditions.*

2) PROJECT DESCRIPTION

As noted above, the proposed project would consist of casino with 238,266 square feet of gaming floor area and ballroom/event space that could accommodate a maximum of 2,500 guests. It would also include 24 Tribal residences, and a 12,555 square foot Tribal administration building. All access to the site would be via a new entrance roadway that would connect to the Auto Mall Parkway as the north leg at its existing intersection with Admiral Callaghan Lane. **Figure 1** shows the project location and the surrounding roadway network. **Figures 2** presents the site plan for the project. Two alternatives to the project have also been studied. Alternative B is a Reduced Intensity Alternative which consists of the same casino project but without the Tribal Housing and Offices. Alternative C is a Non-Gaming Alternative that would involve construction of 50 tribal residences and three Tribal administration buildings with a total of 23,353 square feet of building space. This alternative would also include two commercial buildings with a total of 129,702 square feet of building space and two hotel buildings with a total of 264 hotel rooms.

3) EXISTING CONDITIONS

This section of the report describes the roadways, traffic conditions and other existing transportation characteristics in the vicinity of the project. The primary basis of the analysis is the peak hour level of service for the key intersections. The hours identified as the “peak” hours are generally from 8:00 a.m. to 9:00 a.m. and from 4:30 p.m. to 5:30 p.m. for the transportation facilities described, based on the intersection turning movement counts collected for this analysis. These peak hours will be identified as the AM and PM peak hours. These volumes represent the conditions on a typical weekday (Tuesday through Thursday). An analysis of project impacts on Friday evening traffic conditions is presented in Section 4.10.

3.1 Project Study Intersections

Figure 1 shows the location of the project study intersections included in the analysis. As mentioned above, all access to the site would be via a new entrance roadway that would connect to the Auto Mall Parkway as the north leg at its existing intersection with Admiral Callaghan Lane. The following sixteen study intersections were analyzed.

1. AUTO MALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE
2. AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY
3. COLUMBUS PARKWAY & REDWOOD PARKWAY
4. AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE
5. PLAZA DRIVE & ADMIRAL CALLAGHAN LANE
6. TURNER PARKWAY & ADMIRAL CALLAGHAN LANE
7. PLAZA DRIVE & TURNER PARKWAY
8. ASCOT PARKWAY & TURNER PARKWAY
9. ASCOT PARKWAY & REDWOOD PARKWAY
10. REDWOOD PARKWAY & OAKWOOD AVENUE
11. REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE
12. ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET
13. FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET
14. COLUMBUS PARKWAY & LAKE HERMAN ROAD
15. COLUMBUS PARKWAY & ROSE DRIVE
16. SONOMA BOULEVARD (SR-29) & THE SR-37 WB OFFRAMP

3.2 Traffic Analysis Scenarios

The study intersections were evaluated for the six scenarios described below:

- Scenario 1: *Existing Conditions* – Level of Service (LOS) based on the existing weekday peak hour volumes and existing intersection configurations.

- Scenario 2: *Existing Plus Project Conditions* – Existing traffic volumes plus the trips forecast to be generated by the proposed project.

- Scenario 3: *Baseline (No Project) Conditions* – The Baseline scenario is based on the existing volumes plus growth in background traffic (for three years) plus the traffic from all reasonably foreseeable developments that could substantially affect the volumes at the project study intersections.

- Scenario 4: *Baseline Plus Project Conditions* – This scenario is based on the Baseline traffic volumes plus the trips from the proposed project.

FIGURE 1 | PROJECT LOCATION & STUDY INTERSECTIONS

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates TRAFFIC ENGINEERING, INC.

FIGURE 2 | SITE PLAN
TRANSPORTATION IMPACT ANALYSIS
Scotts Valley Development Project
City of Vallejo

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- Scenario 5: *Cumulative Conditions* – This scenario includes year 2045 cumulative volumes based on planned and approved projects and the Solano Napa Activity Based Model (SNABM).

- Scenario 6: *Cumulative Plus Project Conditions* – This scenario includes year 2045 cumulative volumes based on the SNABM Model plus the forecast trips from proposed project.

3.3 Existing Roadway Network

As discussed previously, the project location and the surrounding roadway network are illustrated in **Figure 1**. The following is a more detailed description of some of the main roadways in the area that could be affected by the project:

- **Interstate 80 (I-80)** - is an east-west freeway that extends from Chicago to San Francisco. Within Vallejo, I-80 is six lanes and is oriented in a north-south direction. I-80 provides access to the project site from the north at Columbus Parkway and from the south at Redwood Parkway.

- **Auto Mall Parkway –** Auto Mall Parkway is an east-west four-lane arterial that begins at the terminus of SR-37 and changes names to the Columbus Parkway to the east of its intersection with St. John's Mine Road. Auto Mall Parkway would provide access to the project site at its intersection with Admiral Callaghan Lane. The posted speed limit is 45 miles per hour (mph); on-street parking is prohibited on Columbus Parkway.

- **Columbus Parkway –** Columbus Parkway is an north-south four-lane arterial that begins at St. John's Mine Road and extends south to terminate at the I-780 westbound ramps. The posted speed limit is 45 miles per hour (mph); on-street parking is prohibited on Columbus Parkway.

- **Admiral Callaghan Lane** – Admiral Callaghan Lane is a north-south four-lane arterial between Columbus Parkway and Turner Parkway and continues as a two-lane arterial between Turner Parkway and Rotary Way. South of Rotary Way, Admiral Callaghan Lane widens back out to a four-lane arterial before continuing as a residential street south of Redwood Parkway. An extension of Admiral Callaghan Lane would provide the primary access to project site. The posted speed limit is 35 mph; on-street parking is prohibited along most of its length.

- **Plaza Drive** – Plaza Drive is a north-south four-lane roadway between Admiral Callaghan Lane to the north and Turner Parkway to the south. Although there is no posted speed limit, vehicles generally travel at approximately 30 mph. On-street parking is prohibited on Plaza Drive.

- **Redwood Parkway** – Redwood Parkway is an east-west four-lane arterial between I-80 and Columbus Parkway. Redwood Parkway provides access to the project site at its intersection with Admiral Callaghan Lane. The posted speed limit is 35 mph; on-street parking is prohibited in the project vicinity.

- **Turner Parkway –** Turner Parkway is an east-west four-lane arterial that extends from Ascot Parkway to Admiral Callaghan Lane. The posted speed limit is 40 mph; on-street parking is prohibited.

- **Sonoma Boulevard** - is a four and six-lane arterial route that extends north-south through the City of Vallejo, and is the major thoroughfare in northwest Vallejo. All major intersections are signalized, and there are several bus routes on Sonoma Boulevard (Hwy 29). The posted speed limit on Sonoma Boulevard north of SR 37 is 50 miles per hour.

3.4 Analysis Methodology

Existing operational conditions at the sixteen (16) study intersections have been evaluated according to the requirements set forth by the Solano County and City of Vallejo General Plans. Analysis of traffic operations was conducted using the 6th Edition of the *Highway Capacity Manual* (*HCM*) Level of Service (LOS) methodology with Synchro software.[1] Level of service is an expression, in the form of a scale, of the relationship between the capacity of an intersection (or roadway segment) to accommodate the volume of traffic moving through it at any given time. The level of service scale describes traffic flow with six ratings ranging from A to F, with “A” indicating relatively free flow of traffic and “F” indicating stop-and-go traffic characterized by traffic jams. As the amount of traffic moving through a given intersection or roadway segment increases, the traffic flow conditions that motorists experience rapidly deteriorate as the capacity of the intersection or roadway segment is reached. Under such conditions, there is general instability in the traffic flow, which means that relatively small incidents (e.g., momentary engine stall) can cause considerable fluctuations in speeds and delays that lead to traffic congestion. This near-capacity situation is labeled level of service (LOS) E. Beyond LOS E, the intersection or roadway segment capacity has been exceeded, and arriving traffic will exceed the ability of the intersection to accommodate it.

For signalized intersections, The *HCM* methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average control delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average control delay and LOS are presented for the intersection. A summary of the HCM results and copies of the detailed HCM LOS calculations are included in the appendix to this report.

[1] *6th Edition of Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2016

Table 1 summarizes the relationship between LOS, average control delay, and the volume to capacity ratio at signalized intersections. For unsignalized intersections (all-way stop controlled and two-way stop controlled) the average control delay and LOS operating conditions are calculated by approach (e.g., northbound) and by movement (e.g., northbound left-turn) for those movements that are subject to delay. In general, the operating conditions for unsignalized intersections are presented for the worst approach. **Table 2** summarizes the relationship between LOS and average control delay at unsignalized intersections. For queuing, the *HCM* methodology implemented with Synchro software was used to calculate the 95th percentile queues for left turn pockets at the project study intersections. The resulting queue lengths are reported in feet and compared to the available left turn storage at each intersection.

3.5 Existing Intersection Capacity Conditions (Scenario 1)

The existing intersection geometry at each of the project study intersections can be seen in **Figure 3** and the existing traffic volumes at each are presented in **Figure 4.** Traffic counts at the study intersections were conducted on June 7th, 2023 when local schools were still in session. **Table 3** summarizes the associated LOS computation results for the existing weekday AM and PM peak hour conditions. Please note that the corresponding LOS analysis calculation sheets are presented in the appendix to this report. As shown in **Table 3**, all of the project study intersections currently have acceptable conditions (LOS E or better) during the weekday AM and PM peak hours. See Section 3.8 for a description of the applicable intersection thresholds.

3.6 Pedestrian and Bicycle Facilities

Bicycle and pedestrian facilities in the project study area are currently very limited with no bike lanes or sidewalks provided in the vicinity of the project. Bicycle paths, lanes and routes are typical examples of bicycle transportation facilities, which are defined by Caltrans as being in one of the four classes:

Class I – Provides a completely separated facility designed for the exclusive use of bicyclists and pedestrians with crossing points minimized.
Class II – Provides a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by pedestrians and motorists permitted.
Class III – Provides a route designated by signs or permanent markings and shared with pedestrians and motorists.
Class IV – Provides an adjacent bike lane or bikeway that is physically separated from motor vehicle traffic.

TABLE 1
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (sec/veh)	Volume to Capacity Ratio
A	Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.	≤ 10	< 0.60
B	Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.	> 10 to 20	> 0.61 to 0.70
C	Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.	> 20 to 35	> 0.71 to 0.80
D	Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.	> 35 to 55	> 0.81 to 0.90
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues from upstream.	> 55 to 80	> 0.91 to 1.00
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80	> 1.00

SOURCES: 6th Edition of the *Highway Capacity Manual*, Transportation Research Board, 2016.

TABLE 2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description of Operations	Average Delay (seconds/vehicle)
A	No delay for stop-controlled approaches.	0 to 10
B	Operations with minor delays.	> 10 to 15
C	Operations with moderate delays.	> 15 to 25
D	Operations with some delays.	> 25 to 35
E	Operations with high delays and long queues.	> 35 to 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50

SOURCE: 6th Edition of the *Highway Capacity Manual*, Transportation Research Board, 2016.

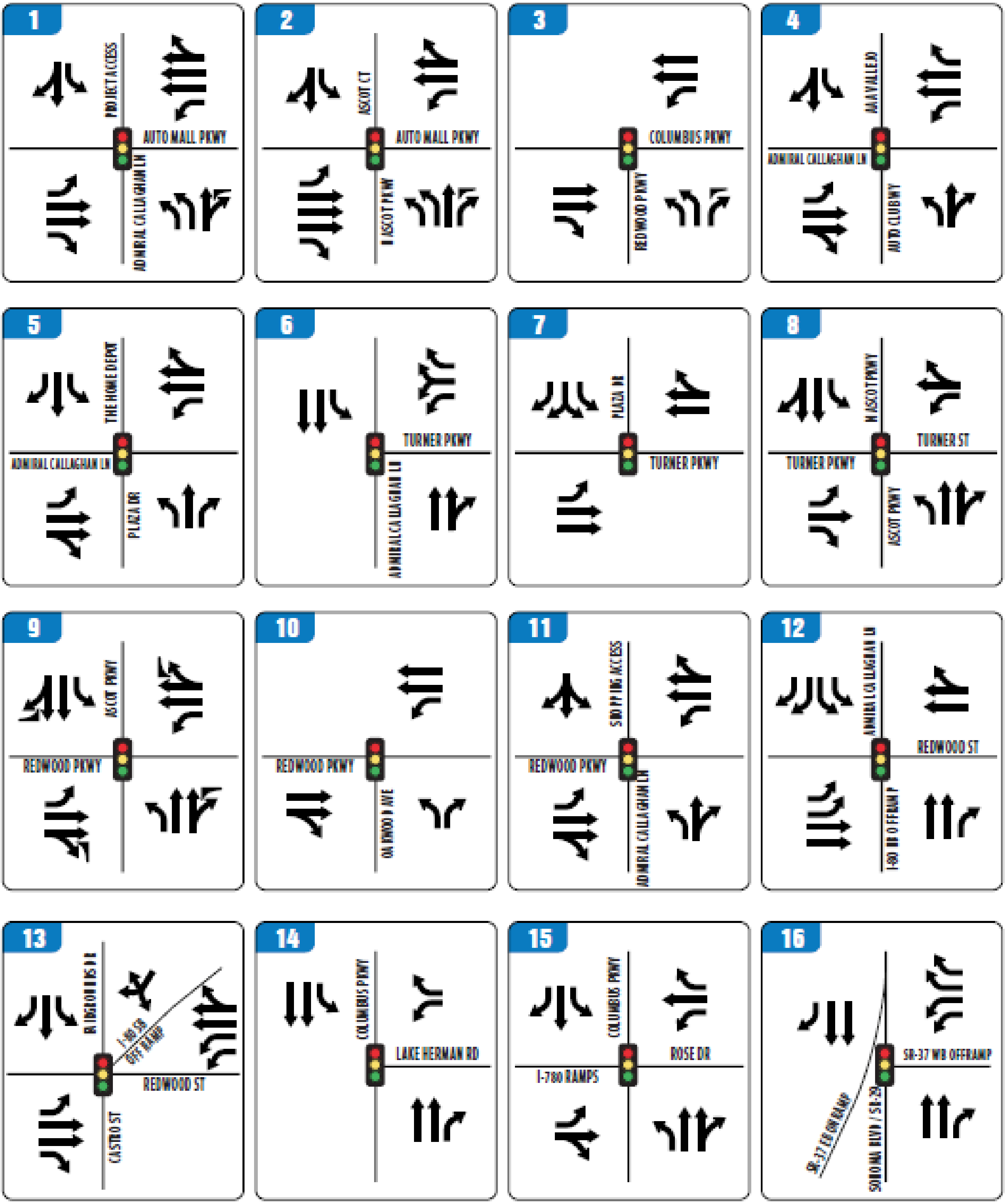

FIGURE 3 | LANE CONFIGURATIONS

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

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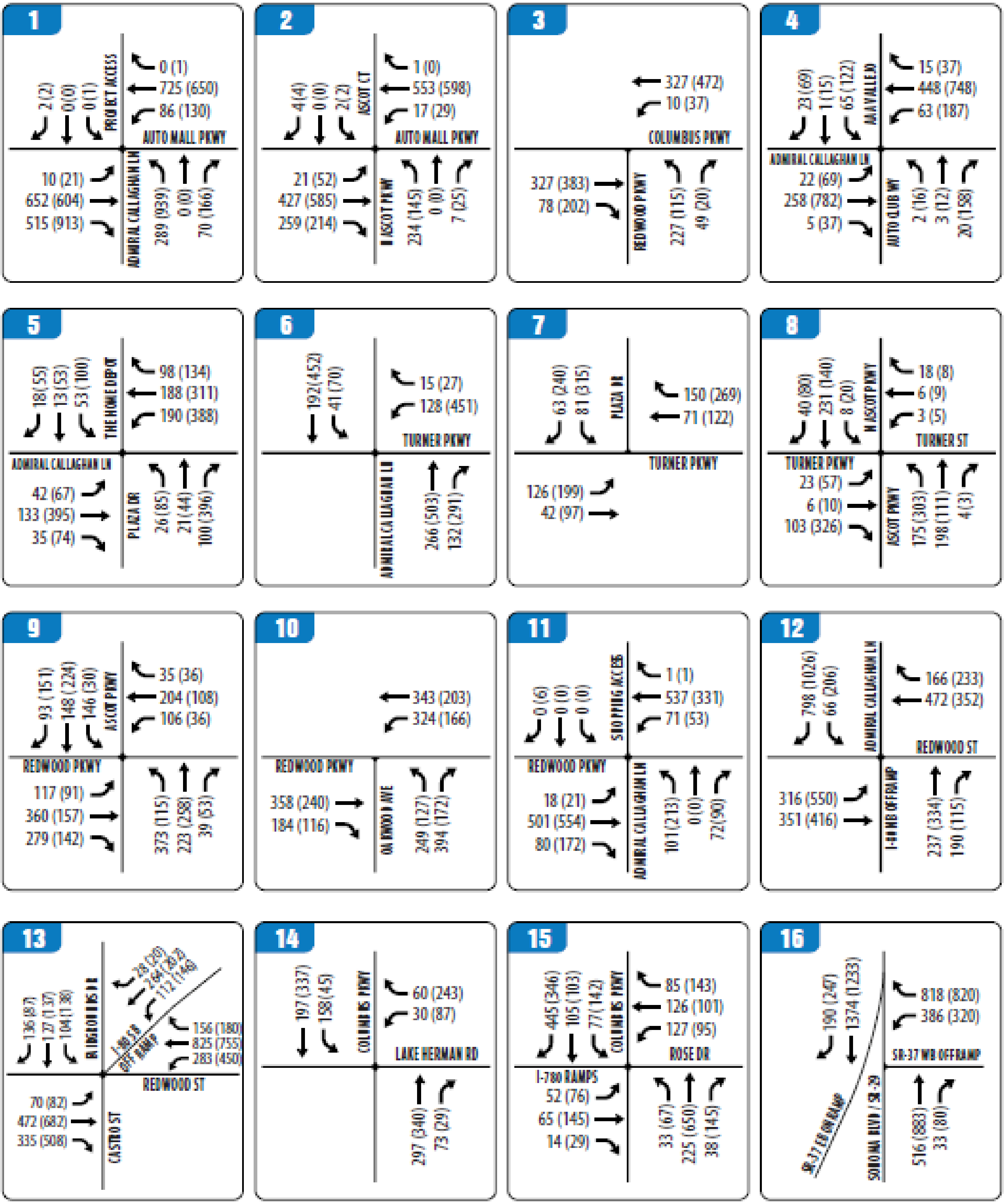

FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

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TABLE 3
EXISTING INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	EXISTING	
				Delay	LOS
1	AUTOMALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	12.5	B
			PM	21.5	C
2	AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY	Signalized	AM	11.9	B
			PM	12.1	B
3	COLUMBUS PARKWAY & REDWOOD PARKWAY	Signalized	AM	8.5	A
			PM	7.4	A
4	AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	8.3	A
			PM	17.0	B
5	PLAZA DRIVE & ADMIRAL CALLAGHAN LANE	Signalized	AM	16.0	B
			PM	44.5	D
6	TURNER PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	7.6	A
			PM	11.5	B
7	PLAZA DRIVE & TURNER PARKWAY	Signalized	AM	10.1	B
			PM	14.4	B
8	ASCOT PARKWAY & TURNER PARKWAY	Signalized	AM	14.0	B
			PM	21.2	C
9	ASCOT PARKWAY & REDWOOD PARKWAY	Signalized	AM	21.6	C
			PM	14.8	B
10	REDWOOD PARKWAY & OAKWOOD AVENUE	Signalized	AM	21.8	C
			PM	11.2	B
11	REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	9.0	A
			PM	11.8	B
12	ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	19.1	B
			PM	23.7	C
13	FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	29.9	C
			PM	31.6	D
14	COLUMBUS PARKWAY & LAKE HERMAN ROAD	Signalized	AM	8.5	A
			PM	10.2	B
15	COLUMBUS PARKWAY & ROSE DRIVE	Signalized	AM	18.0	B
			PM	21.4	C
16	SONOMA BOULEVARD (SR-29) & SR-37 WB OFFRAMP	Signalized	AM	21.6	C
			PM	17.6	B

SOURCE: Abrams Associates, 2024 **NOTE:** Delay results are presented in terms of seconds per vehicle.

Sidewalks are provided on most existing roadways in the study area with the exception of the north side of Auto Mall Parkway and Columbus Parkway. Bicycle lanes are provided on Redwood Parkway, Turner Parkway and Ascot Parkway. In addition, the Solano Bikeway (a Class I multi modal trail) extends north from the end of Admiral Callaghan Parkway along the project frontage and I-80 to McGary Road.

3.7 Transit Service

The major public transit operators that provide service within or adjacent to the study area include the San Francisco Bay Ferry, SolTrans and BART/Amtrak. These operators are described below.

San Francisco Bay Ferry - The San Francisco Bay Ferry/Vallejo Route offers ferry service daily between Vallejo and the San Francisco Ferry Building and San Francisco Pier 41. The Vallejo Ferry Terminal is located at 295 Mare Island Way approximately four miles from the project site. Parking is available at the Vallejo Ferry Terminal.

Bus Transit - Bus transit service in the project area is provided by SolTrans. SolTrans provides local and express bus service to the Solano County cities of Vallejo, Benicia, and Fairfield. Express bus service connects to the Contra Costa County communities of El Cerrito, Pleasant Hill, and Walnut Creek, with regional connections to BART. The following bus routes are proximate to the project site - SolTrans bus routes 7 and 38 within the City of Vallejo. Route 7 operates from approximately from 6:45 AM to 9:00 PM on weekdays, from approximately 8:45 AM to 7:00 PM on Saturdays, and from approximately 8:45 AM to 7:00 PM on Sundays. The route connects the Vallejo Transit Center with Gateway Place, and businesses, neighborhoods, and schools along Florida Street and Springs Road.

Near the project site, bus stops for Routes 7A, 7B, and 38 are located on Auto Mall Parkway west of St. John's Mine Road, which is about ¾ of a mile from the project site. Route 38 is a school tripper route that operates on weekday mornings. SolTrans ADA Paratransit bus service is also available to certified persons with disabilities unable to board a regular SolTrans fixed route bus, access a SolTrans bus stop, or otherwise navigate the regular fixed-route bus system due to a disabling condition as defined by the Americans with Disabilities Act (ADA). SolTrans Paratransit provides a shared ride, origin to destination bus service by advance appointment. Service operates parallel to the fixed route system, during the same hours and days.

BART/Amtrak - BART and Amtrak connections within Solano County can be made to Solano Express routes with connections to BART and/or Amtrak, which include the R and Y routes. The nearest BART/Amtrak station is located about 16 miles away in the City of Richmond.

3.8 Standards and Objectives

Existing policies, laws and regulations that have been used to guide the evaluation of potential off-site impacts from the proposed project are summarized below.

Caltrans - The California Department of Transportation (Caltrans) has jurisdiction over State highways. Therefore, Caltrans controls all construction, modification, and maintenance of State highways, such as U.S. 101. Any improvements to these roadways would require Caltrans' approval. As per Caltrans' Transportation Impact Study Guide, VMT analysis has now replaced level of service, the prior widely applied metric used for CEQA transportation analysis. Caltrans' primary review focus for a land use project's impact is now VMT.[2] Therefore, an analysis of level of service for freeways was not provided.

[2] *Vehicle Miles Traveled-Focused Transportation Impact Study Guide*, Caltrans, Sacramento, CA, May 20, 2020.

Vallejo General Plan - The Transportation and Circulation Element included in the City of Vallejo General Plan was prepared pursuant to Section 65302(b) of the California Government Code. The Transportation and Circulation Element addresses the location and extent of existing and planned transportation routes, terminals, and other local public utilities and facilities. The General Plan identifies roadway and transit goals and policies that have been adopted to ensure that the transportation system of the City will have adequate capacity to serve planned growth. These goals and policies are intended to provide a plan and implementation measures for an integrated, multi-modal transportation system that will safely and efficiently meet the transportation needs of all economic and social segments of the City.

Solano Transportation Authority Comprehensive Transportation Plan - The Comprehensive Transportation Plan (CTP) for Solano County identifies, plans, and prioritizes the transportation needs of Solano County through 2040. Solano County's transportation planning agency, the Solano Transportation Authority (STA), as the Transportation Planning and Congestion Management Agency for Solano County, developed the CTP 2040 in collaboration with its many transportation partners and the public. The CTP identifies overall policies as well as specific policies and projects for key plan elements including: arterials, highways, freeways, transit, and alternative modes.

Significance Criteria – For the purposes of this analysis a project would have a significant impact if it would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the off-reservation circulation system, taking into account all modes of transportation including mass transit and nonmotorized travel and relevant components of the circulation system, including, but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

- Consistent with Policy MTC 2.5 and Action MTC 2.5B in the Vallejo General Plan 2040, the advisory standard of the City of Vallejo is to maintain Level of Service (LOS) E during the peak hours "to be considered along with, but not to override, metrics for pedestrian, bicycle, transit and emergency access performance." Please note this report also includes one intersection outside the Vallejo city limits (Columbus Parkway at Rose Drive). The applicable measures of effectiveness are summarized below:

  Signalized Intersections - Project-related operational effects on the City's signalized study intersections are considered to result in significant effects if project-related traffic causes the Level of Service (LOS) rating to deteriorate to LOS F. If a signalized intersection is operating unacceptably before the addition of project trips, it would be considered a significant effect if the project causes the v/c ratio, as calculated with the HCM methodology, to increase by 0.01 or more at a signalized intersection operating at LOS F without the project. There is one study intersection outside the City limits. At Columbus Parkway at Rose Drive the Solano County/Caltrans standard of LOS D applies and it would be considered to result in a significant effect if project-related traffic causes the Level of Service (LOS) rating to deteriorate to LOS E.

Unsignalized Intersections - Project-related operational effects on unsignalized intersections are considered to result in significant effects if project generated traffic causes the LOS at an unsignalized intersection to degrade to worse than LOS E. As with signalized intersections, if an intersection is operating unacceptably before the addition of project trips, it would be considered a significant effect if the project causes a stop-controlled intersection to fall to LOS F (for side-street stop-controlled intersections, for the worst side street movement or approach), or adds traffic to a stop-controlled intersection already operating at LOS F and the California Manual on Uniform Traffic Control Devices peak hour signal warrant is met. Again, for Columbus Parkway at Rose Drive the Solano County/Caltrans standard of LOS D applies.

- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated off-reservation roads or highways.
- Substantially increase hazards to an off-reservation design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access for off-reservation responders.

4) TRANSPORTATION IMPACT ANALYSIS

4.1 Project Trip Generation

Casino Trip Generation – The trip generation forecasts for the Proposed Project are presented in **Table 4**. The peak-hour trip generation of the proposed casino was reviewed based on information published in Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition, 2021).[3] However, as described below, more recent trip generation data available from surveys of existing Native American casinos is available, and this data was used to estimate the traffic that would be produced by the casino portion of the project. The ITE Trip Generation Manual is generally the standard reference from which to determine trip generation rates. However, the rates for a casino included in the latest edition of the ITE Trip Generation Manual are based on limited surveys of casino/video lottery establishments in other parts of the country taken as far back as the 1990's. In addition, the square footages of the surveyed facilities ranged from 600 to 2,400 square feet. Based on preliminary calculations and a comparison of the ITE rates with other studies (as described below) it was found that use of the ITE rates would be inappropriate and produced results that did not compare with the expected traffic of the proposed project.

The approach used for establishing trip generation rates for the casino was to investigate trip generation characteristics at other similar casinos based on the results of trip generation surveys and validate the results with traffic counts at the existing casino. For this project additional data on casino trip generation rates were obtained from the transportation impact analysis prepared for the Tejon Casino in Kern County.[4] The trip generation rates were based on the fitted curve equations developed from traffic surveys conducted at three similar Native American casinos as part of the Tejon Casino Transportation Impact Analysis. This document includes extensive discussions on the research performed to determine an appropriate trip generation rate for Native American gaming facilities and on the actually developed trip rates for weekday daily, AM and PM peak of the street, as well as weekend peak hour conditions. The trip rates were verified to be conservative based on trip generation surveys conducted at the Graton Resort & Casino.[5] Consistent with other casino traffic studies, the total casino traffic was also reduced by 10% to account for pass-by traffic (i.e. 90% of the casino trips were considered to be new trips to the area).[6]

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[3] *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers (ITE), Washington D.C., September, 2021.
[4] *Transportation Impact Analysis of the Tejon Casino*, Linscott, Law, & Greenspan Engineers, San Diego, CA, October 30, 2019.
[5] *Graton Resort and Casino Expansion Project Traffic Impact Study*, Abrams Associates Traffic Engineering, Walnut Creek, CA, March 29, 2023.
[6] *Final Report – Phased Transportation Study for Proposed Urban Casinos in West Contra Costa County*, Dowling Associates, Inc., Oakland, CA, December 28, 2007.

TABLE 4
PROJECT TRIP GENERATION CALCULATIONS

Land Use	Size	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Tribal Casino Trip Rates - Trips per Square Foot		38.31	1.30	0.77	2.07	1.90	1.55	3.45
Unadjusted Casino Trip Generation	**238,266 sq. ft.**	9,128	311	182	493	452	370	822
Pass-By Traffic Reduction (10%)		913	31	18	49	45	37	82
Net New Off-Site Casino Trip Generation		**8,215**	**280**	**164**	**444**	**407**	**333**	**740**
ITE Single Family Detached Housing Trip Rates - Trips per Unit		11.31	0.23	0.69	0.92	0.60	0.35	0.95
Tribal Housing Trip Generation	**24 units**	**271**	**6**	**16**	**22**	**15**	**8**	**23**
ITE General Office Building Trip Rates - Trips per Square Foot		15.20	0.84	0.11	0.95	0.40	1.96	2.36
Tribal Offices Trip Generation	**12,555 sq. ft.**	191	11	1	12	5	25	30
Shared Traffic Reduction (50%)		95	6	0	6	3	12	15
Net New Off-Site Tribal Offices Trip Generation		**95**	**6**	**0**	**6**	**2**	**13**	**15**
Total Project Trip Generation		**8,582**	**291**	**181**	**472**	**424**	**354**	**778**

Tribal Housing and Tribal Administration Building Trip Generation - The trip generation for the Tribal housing and the Tribal administration building are based on trip generation rates using the fitted curve equations for Single Family Detached Housing (ITE Land Use Code 210) and General Office Building (ITE Land Use Code 710) from the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 11th Edition. It was assumed that approximately two thirds of the traffic to and from the Tribal Administration Building would be shared with trips from the Tribal residences and the casino. All the rates used in the analysis are presented in **Table 4,** which also summarizes the estimated weekday a.m. and p.m. peak-hour trip generation of the Proposed Project. During the normal weekday commute peak hours the total trip generation for the Proposed Project is estimated to be approximately 472 AM peak hour trips (291 inbound and 181 outbound) and 778 PM peak hour trips (424 inbound and 354 outbound).

4.2 Project Trip Distribution

The trip distribution assumptions have been based on the project's proximity to the access freeway and other key travel routes in Solano County, the existing directional split at nearby intersections, and engineering judgement considering the overall land use patterns in the area. A figure presenting the distribution percentages assumed for the analysis is included in the technical appendix to this report. **Figure 5** shows the project trips that would be added at each the project study intersections.

4.3 Existing Plus Project Traffic Capacity Conditions (Scenario 2)

This scenario evaluates the existing conditions with the addition of traffic from the proposed project. The traffic volumes for each of the study intersections for Existing Plus Project conditions are shown in **Figure 6**. The capacity calculations for the Existing Plus Project scenario are shown in **Table 5**. The corresponding LOS analysis calculation sheets are presented in the appendix to this report. As shown in **Table 5**, all of the project study intersections would continue to have acceptable conditions (LOS E or better) during the weekday AM and PM peak hours under the existing plus project scenario) Please note this scenario represents average weekday conditions that assume there is no event being held at the theater. Friday Theater/Special Event conditions are analyzed in Section 4.12.

4.4 Existing Plus Project Queuing Conditions

A review was conducted of the 95th percentile queue lengths, as determined with Synchro software, to determine if the existing plus project queue lengths exceed the storage provided at the project study intersections. The instance of a queue exceeding available storage is not in itself a significant impact as the City has no significance criteria for queuing. However, project-related operational effects on queuing at an intersection are reported if project generated traffic causes the forecast queues to extend beyond the existing available turn pocket storage by more than one vehicle. When turn pocket storage is exceeded, safety and sight distance are reviewed to determine if improvements are warranted.

Please note that queue lengths for all approaches to the project study intersections under this scenario are reported in the detailed LOS calculations included in the technical appendix to this report. Based on a review of the existing plus project queue lengths there are three intersections where available storage is forecast to be exceeded. As shown in **Table 6**, at Auto Mall Parkway and Admiral Callaghan Lane (Intersection #1) the eastbound left turn pocket has about 230 feet of storage and the calculations indicate the existing plus project queue length is forecast to be about 383 feet during the PM peak hour. The project is also forecast to contribute to queues that already exceed existing storage on the northbound left turn from Admiral Callaghan Lane at Intersection #1, the westbound and southbound left turn movements at Intersection #5, and the southbound left turn movements at Intersection #13.

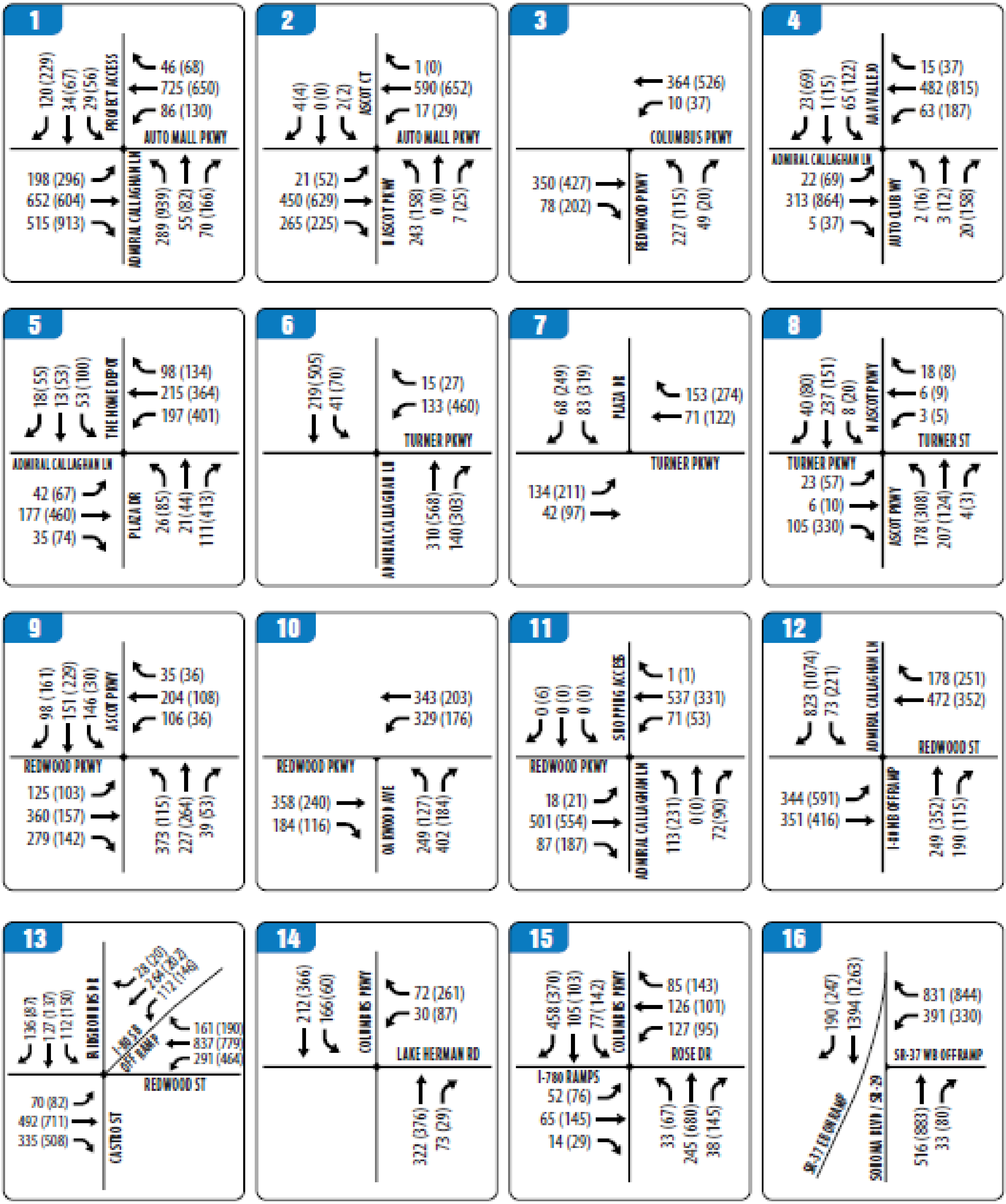

FIGURE 6 | EXISTING PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

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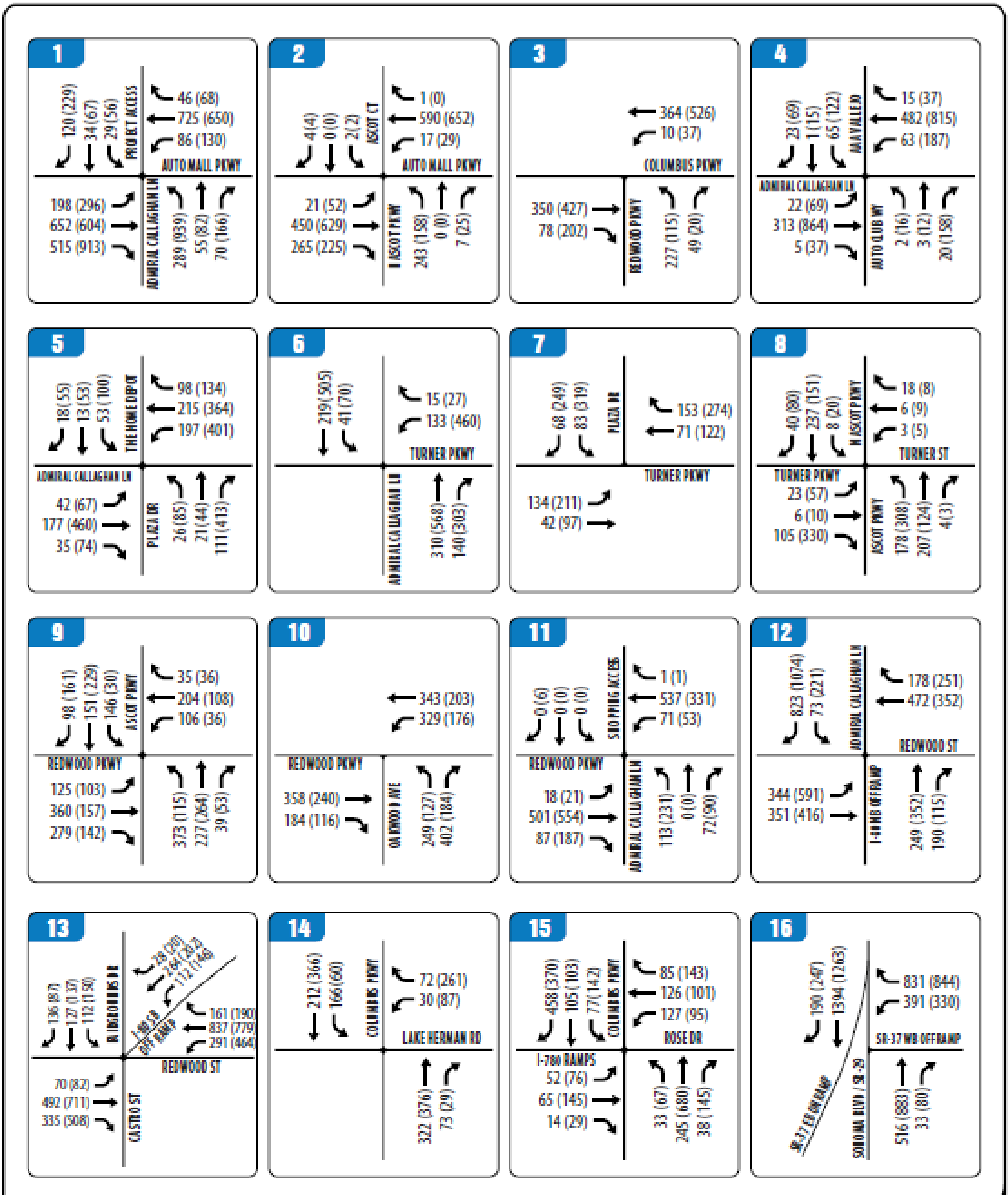

FIGURE 6 | EXISTING PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates

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TABLE 5
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	AUTOMALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	12.5	B	19.6	B
			PM	21.5	C	50.3	D
2	AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY	Signalized	AM	11.9	B	12.0	B
			PM	12.1	B	12.3	B
3	COLUMBUS PARKWAY & REDWOOD PARKWAY	Signalized	AM	8.5	A	8.4	A
			PM	7.4	A	7.3	A
4	AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	8.3	A	8.3	A
			PM	17.0	B	17.8	B
5	PLAZA DRIVE & ADMIRAL CALLAGHAN LANE	Signalized	AM	16.0	B	16.3	B
			PM	44.5	D	52.5	D
6	TURNER PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	7.6	A	7.6	A
			PM	11.5	B	11.8	B
7	PLAZA DRIVE & TURNER PARKWAY	Signalized	AM	10.1	B	10.3	B
			PM	14.4	B	14.8	B
8	ASCOT PARKWAY & TURNER PARKWAY	Signalized	AM	14.0	B	14.0	B
			PM	21.2	C	21.5	C
9	ASCOT PARKWAY & REDWOOD PARKWAY	Signalized	AM	21.6	C	21.7	C
			PM	14.8	B	15.1	B
10	REDWOOD PARKWAY & OAKWOOD AVENUE	Signalized	AM	21.8	C	22.4	C
			PM	11.2	B	11.5	B
11	REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	9.0	A	9.1	A
			PM	11.8	B	12.3	B
12	ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	19.1	B	19.9	B
			PM	23.7	C	25.7	C
13	FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	29.9	C	31.0	C
			PM	31.6	D	32.5	C
14	COLUMBUS PARKWAY & LAKE HERMAN ROAD	Signalized	AM	8.5	A	8.7	A
			PM	10.2	B	10.6	B
15	COLUMBUS PARKWAY & ROSE DRIVE	Signalized	AM	18.0	B	18.1	B
			PM	21.4	C	21.7	C
16	SONOMA BOULEVARD (SR-29) & SR-37 WB OFFRAMP	Signalized	AM	21.6	C	22.7	C
			PM	17.6	B	18.9	B

SOURCE: Abrams Associates, 2024 **NOTE:** Delay results are presented in terms of seconds per vehicle.

At Intersection #1 the queues would have the potential to create safety problems if they were to extend back into the SR 37/I-80 interchange. As discussed in Section 5.0, the proposed mitigation to address the queueing and intersection operations at Intersection #1 is to widen Auto Mall Parkway to provide for a dual eastbound left turn movement. In addition, a right turn overlap phase (i.e., a green arrow for southbound traffic turning right out of the site towards I-80) would also be required.

TABLE 6
EXISTING PEAK HOUR QUEUING ANALYSIS

ID	Intersection	Turn Lane	Available Storage (ft)	Period	95th % Queue (ft)		
					No Project	With Project	Delta
1	Auto Mall Parkway / Columbus Parkway & Admiral Callaghan Lane	EBL	230 ft	AM	21	193	172
				PM	41	383	342
		WBL	215 ft	AM	88	102	14
				PM	169	188	19
		NBL	425 ft	AM	114	136	22
				PM	405	480	75
		SBL	100 ft	AM	0	48	48
				PM	7	85	78
5	Admiral Callaghan Lane & Plaza Drive	EBL	250 ft	AM	42	44	2
				PM	103	104	1
		WBL	250 ft	AM	122	132	10
				PM	418	463	45
		NBL	200 ft	AM	30	32	2
				PM	117	118	1
		SBL	100 ft	AM	49	52	3
				PM	134	135	1
13	Redwood Street & Fairgrounds Drive / I-80 Southbound Ramps	EBL	160 ft	AM	141	141	0
				PM	122	122	0
		WBL	285 ft	AM	151	168	17
				PM	245	250	5
		SBL	125 ft	AM	129	150	21
				PM	180	193	13
		SWBL	150 ft	AM	138	139	1
				PM	186	186	0

4.5 Baseline Traffic Capacity Conditions (Scenario 3)

The Baseline scenario evaluates the existing conditions with the addition of traffic from reasonably foreseeable projects in the area and general baseline growth in traffic. For this analysis the baseline volumes were developed based on the assumption that the project completion date would be 2028 with a 10% growth in background traffic (representing a partial return to pre-covid conditions). This scenario also includes traffic from the approved (but not yet constructed) RSC Vallejo Apartment Project.[7] The traffic volumes for each of the study intersections for the Baseline scenario are shown in **Figure 7**. **Table 7** summarizes the associated LOS computation results for the Baseline weekday AM and PM peak hour conditions. As shown in **Table 7**, all of the study intersections would continue to have acceptable conditions under the Baseline scenario during the weekday AM and PM peak hours.

[7] *RSC Vallejo Traffic Impact Analysis*, Abrams Associates Traffic Engineering, Walnut Creek, CA, October 23, 2023.

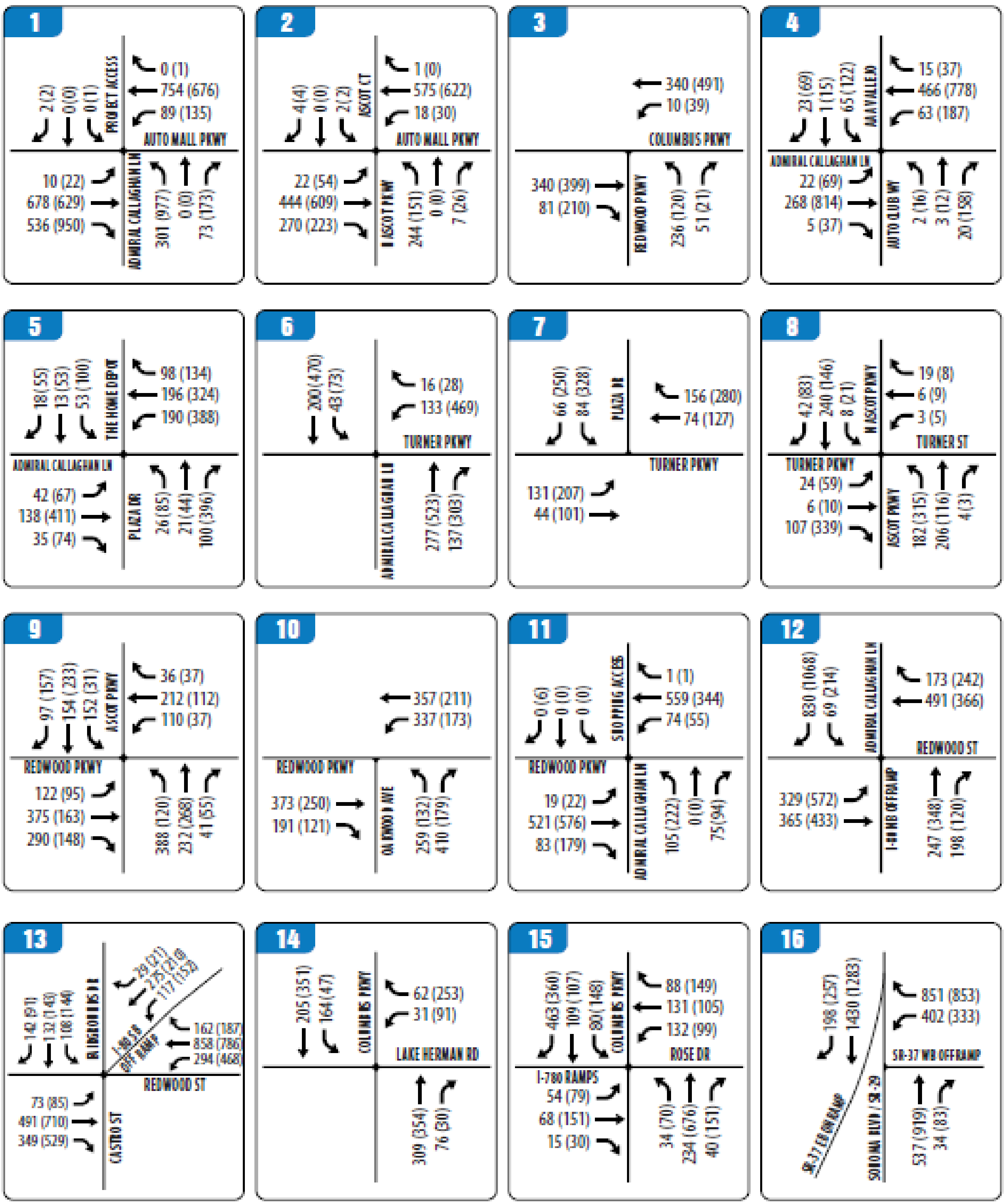

FIGURE 7 | BASELINE AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates
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4.6 Baseline Plus Project Traffic Capacity Conditions (Scenario 4)

The Baseline plus proposed project traffic forecasts were developed by adding traffic from the project to the baseline traffic volumes. The traffic volumes for each of the study intersections for the Baseline Plus Project scenario are shown in **Figure 8**. **Table 7** summarizes the LOS results for the Baseline and Baseline Plus Project weekday AM and PM peak hour conditions. The corresponding LOS analysis calculation sheets are presented in the appendix to this report. As shown in **Table 7**, all of the study intersections would continue to have acceptable conditions under the Baseline Plus Project scenario during the weekday AM and PM peak hours. Please note this scenario represents average weekday conditions that assume there is no event being held at the proposed theater. Theater/Special Event conditions are analyzed in Section 4.12.

TABLE 7
BASELINE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	BASELINE		BASELINE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	AUTOMALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	12.7	B	20.0	B
			PM	22.5	C	54.2	D
2	AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY	Signalized	AM	12.1	B	12.2	B
			PM	12.3	B	12.4	B
3	COLUMBUS PARKWAY & REDWOOD PARKWAY	Signalized	AM	8.5	A	8.5	A
			PM	7.4	A	7.4	A
4	AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	8.3	A	8.3	A
			PM	17.3	B	18.1	B
5	PLAZA DRIVE & ADMIRAL CALLAGHAN LANE	Signalized	AM	16.0	B	16.3	B
			PM	44.6	D	53.7	D
6	TURNER PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	7.7	A	7.7	A
			PM	11.9	B	12.2	B
7	PLAZA DRIVE & TURNER PARKWAY	Signalized	AM	10.2	B	10.4	B
			PM	14.9	B	15.4	B
8	ASCOT PARKWAY & TURNER PARKWAY	Signalized	AM	14.1	B	14.1	B
			PM	22.0	C	22.4	C
9	ASCOT PARKWAY & REDWOOD PARKWAY	Signalized	AM	22.4	C	22.4	C
			PM	15.0	B	15.2	B
10	REDWOOD PARKWAY & OAKWOOD AVENUE	Signalized	AM	23.8	C	24.5	C
			PM	11.4	B	11.8	B
11	REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	9.1	A	9.2	A
			PM	12.2	B	12.7	B
12	ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	19.8	B	20.7	C
			PM	25.1	C	27.2	C
13	FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	32.2	C	45.9	D
			PM	33.0	C	33.9	C
14	COLUMBUS PARKWAY & LAKE HERMAN ROAD	Signalized	AM	8.6	A	8.8	A
			PM	10.4	B	10.8	B
15	COLUMBUS PARKWAY & ROSE DRIVE	Signalized	AM	18.5	B	18.6	B
			PM	22.4	C	22.7	C
16	SONOMA BOULEVARD (SR-29) & SR-37 WB OFFRAMP	Signalized	AM	24.8	C	26.1	C
			PM	19.7	B	21.4	C

SOURCE: Abrams Associates, 2024 **NOTE:** Delay results are presented in terms of seconds per vehicle.

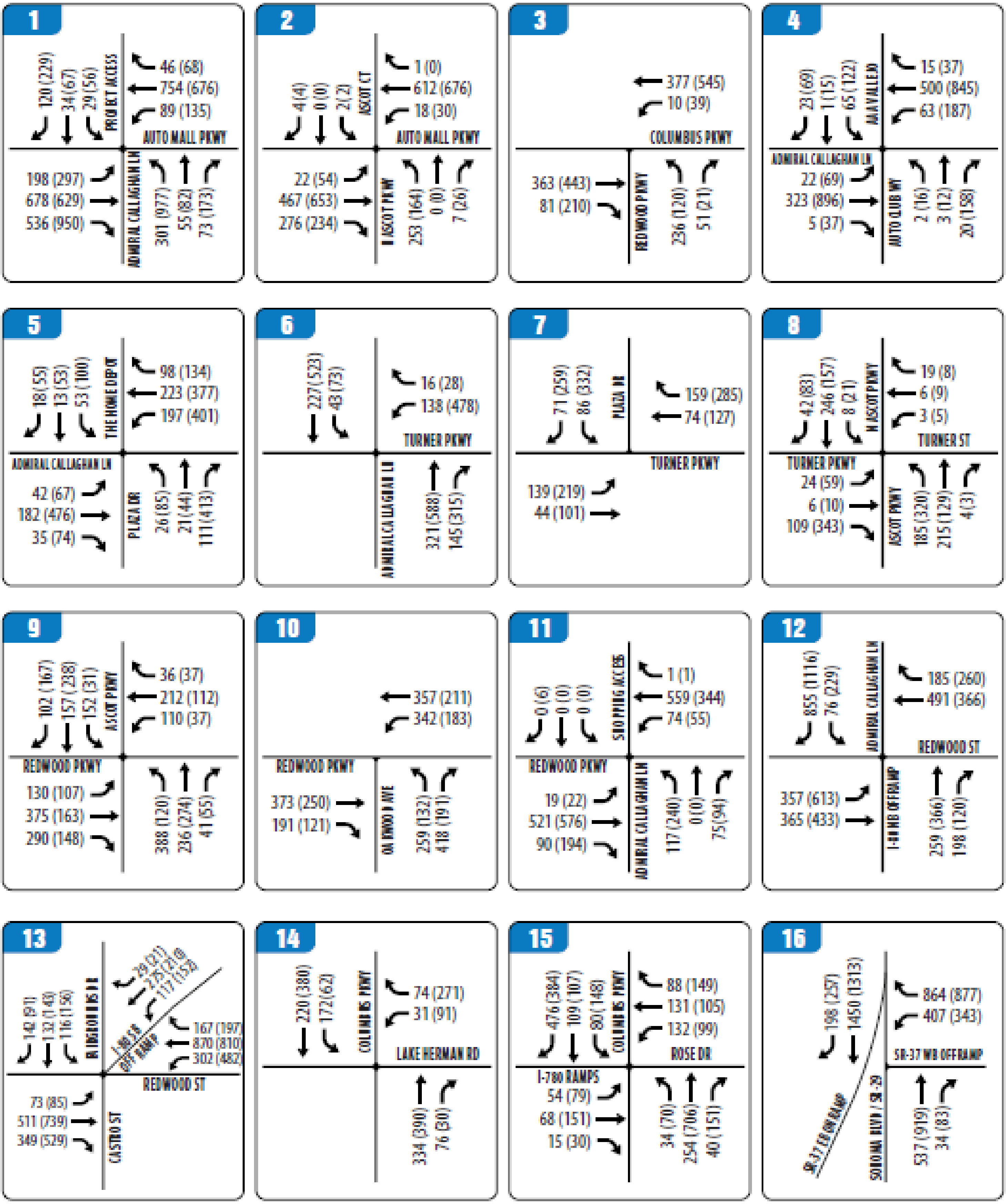

FIGURE 8 | BASELINE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates
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4.7 Baseline Plus Project Queuing Conditions

A review was conducted of the 95th percentile queue lengths, as determined with Synchro software, to determine if the existing plus project queue lengths exceed the storage provided at the project study intersections. The instance of a queue exceeding available storage is not in itself a significant impact as the City has no significance criteria for queuing. However, project-related operational effects on queuing at an intersection are reported if project generated traffic causes the forecast queues to extend beyond the existing available turn pocket storage by more than one vehicle. When turn pocket storage is exceeded, safety and sight distance are reviewed to determine if improvements are warranted.

Please note that queue lengths for all approaches to the project study intersections under this scenario are reported in the detailed LOS calculations included in the technical appendix to this report. Based on a review of the baseline plus project queue lengths there are three intersections where available storage is forecast to be exceeded during the AM and PM peak hours. As shown in **Table 8**, at the intersection of Auto Mall Parkway with Admiral Callaghan Lane (Intersection #1) the eastbound left turn pocket has about 230 feet of storage and the calculations indicate the existing plus project queue length is forecast to be about 394 feet during the PM peak hour. The project is also forecast to contribute to queues that already exceed existing storage on the northbound left turn from Admiral Callaghan Lane at Intersection #1, the westbound and southbound left turn movements at Intersection #5, and the southbound left turn movements at Intersection #13.

At Intersection #1 the queues would have the potential to create safety problems if they were to extend back into the SR 37/I-80 interchange. As discussed in Section 5.0, the proposed mitigation to address the queueing and intersection operations at Intersection #1 is to widen Auto Mall Parkway to provide for a dual eastbound left turn movement. In addition, a right turn overlap phase (i.e., a green arrow for southbound traffic turning right out of the site towards I-80) would also be required. As discussed in Section 5.0, the proposed mitigation to address the operations at Intersection #1 is to widen Auto Mall Parkway to provide for a dual eastbound left turn movement. In addition, a right turn overlap phase (i.e., a green arrow for southbound traffic turning right out of the site towards I-80) would also be required.

4.8 Cumulative Traffic Capacity Conditions (Scenario 5)

For the cumulative conditions, the intersection traffic volumes were based on the existing turning movements plus incremental 1% per year growth in background traffic based on the Solano Napa Activity Based Model and consistent with the most recent traffic study conducted in the area.[8] Traffic was also added for planned projects in the area consistent with the traffic studies for those projects, including the RSC Vallejo Apartment Project and the Fairview at

[8] *Fairview at Northgate Transportation Impact Analysis*, Fehr & Peers, Walnut Creek, CA, December, 2019.

TABLE 8
BASELINE PEAK HOUR QUEUING ANALYSIS

ID	Intersection	Turn Lane	Available Storage (ft)	Period	95th % Queue (ft)		
					No Project	With Project	Delta
1	Auto Mall Parkway / Columbus Parkway & Admiral Callaghan Lane	EBL	230 ft	AM	22	197	175
				PM	44	394	350
		WBL	215 ft	AM	93	108	15
				PM	178	193	15
		NBL	425 ft	AM	122	142	20
				PM	409	510	101
		SBL	100 ft	AM	0	49	49
				PM	7	85	78
5	Admiral Callaghan Lane & Plaza Drive	EBL	250 ft	AM	43	45	2
				PM	101	104	3
		WBL	250 ft	AM	122	133	11
				PM	403	466	63
		NBL	200 ft	AM	31	32	1
				PM	116	119	3
		SBL	100 ft	AM	50	52	2
				PM	132	136	4
13	Redwood Street & Fairgrounds Drive / I-80 Southbound Ramps	EBL	160 ft	AM	119	159	40
				PM	125	134	9
		WBL	285 ft	AM	170	174	4
				PM	256	263	7
		SBL	125 ft	AM	145	154	9
				PM	187	201	14
		SWBL	150 ft	AM	143	156	13
				PM	192	194	2

Northgate Project. In addition, the analysis of Intersections #12 and #13 accounts for future roadway improvements included as part of the planned Redwood Road Interchange Project. **Figure 9** presents the cumulative build-out traffic volumes for the project study intersections. **Table 9** summarizes the LOS results for the Cumulative (Year 2045) traffic conditions at each of the project study intersections. As shown on this table, the project study intersections would be forecast to continue to have acceptable conditions during the weekday AM and PM peak commute hours.

4.9 Cumulative Plus Project Traffic Capacity Conditions (Scenario 6)

Table 9 summarizes the LOS results for the Cumulative Plus Project (Year 2045) traffic conditions at each of the project study intersection. **Figure 10** presents the cumulative build-out traffic volumes including the traffic from the proposed project. As shown on this table, all of the signalized study intersections would continue to have acceptable conditions during the weekday

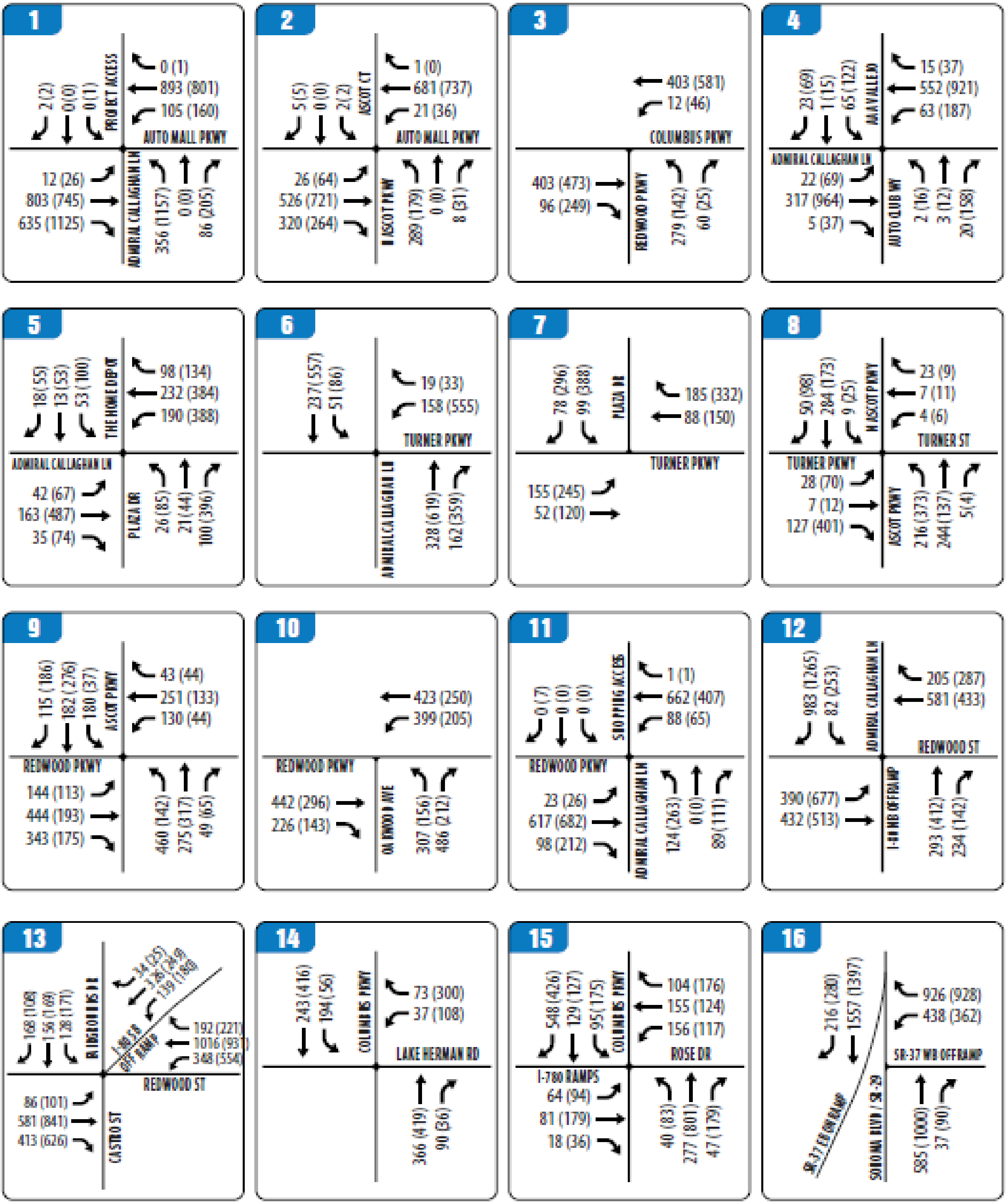

FIGURE 9 | CUMULATIVE AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

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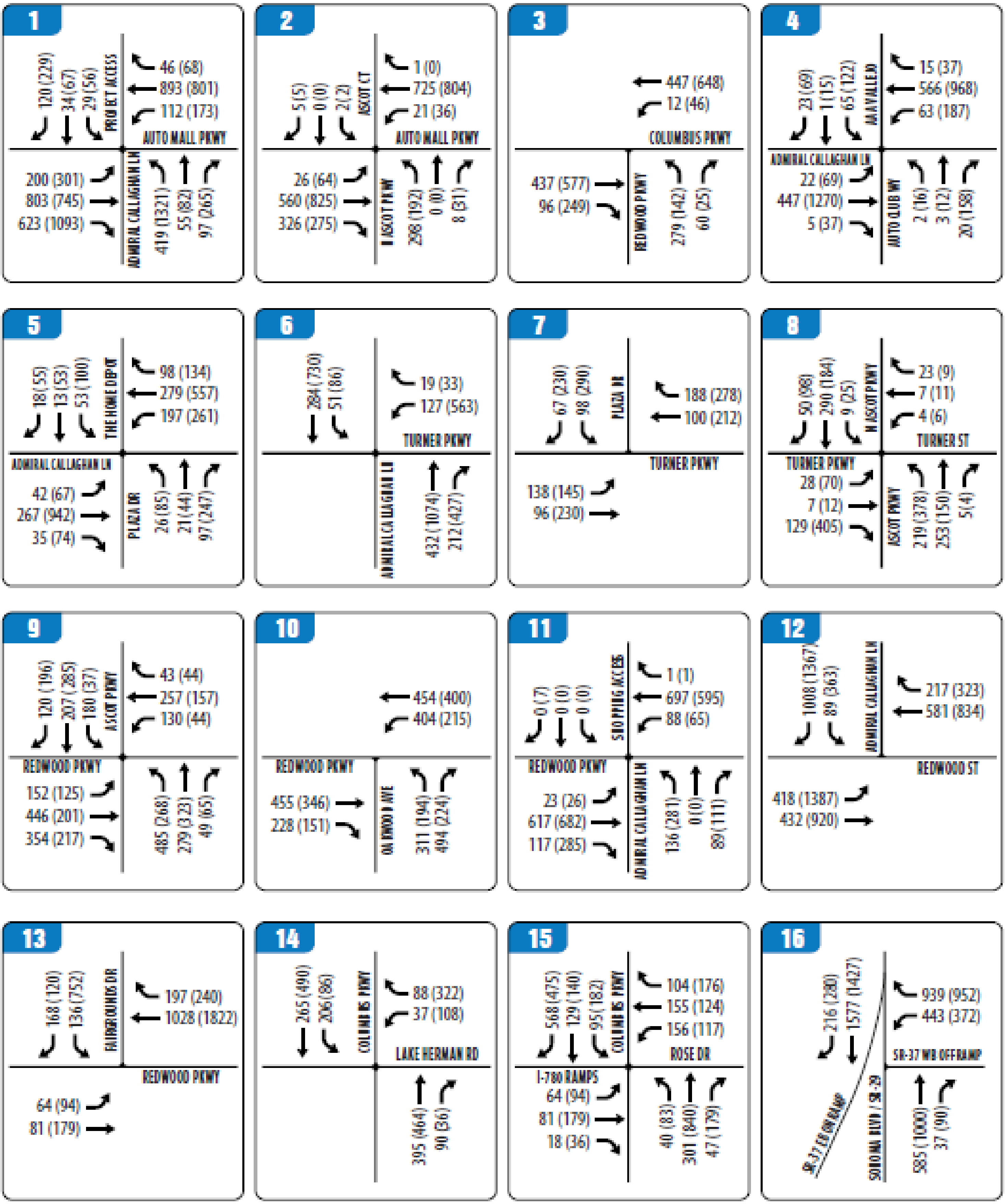

FIGURE 10 | CUMULATIVE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

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TABLE 9
CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	AUTOMALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	14.0	B	21.4	C
			PM	32.0	C	73.9	E
2	AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY	Signalized	AM	12.8	B	13.0	B
			PM	13.0	B	13.2	B
3	COLUMBUS PARKWAY & REDWOOD PARKWAY	Signalized	AM	8.9	A	8.9	A
			PM	7.7	A	7.6	A
4	AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	8.3	A	8.3	A
			PM	22.3	C	24.0	C
5	PLAZA DRIVE & ADMIRAL CALLAGHAN LANE	Signalized	AM	16.1	B	16.4	B
			PM	32.4	C	37.3	D
6	TURNER PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	7.8	A	7.8	A
			PM	19.1	B	20.9	C
7	PLAZA DRIVE & TURNER PARKWAY	Signalized	AM	9.9	A	10.1	B
			PM	12.0	B	12.4	B
8	ASCOT PARKWAY & TURNER PARKWAY	Signalized	AM	14.9	B	14.9	B
			PM	28.1	C	28.8	C
9	ASCOT PARKWAY & REDWOOD PARKWAY	Signalized	AM	28.1	C	28.2	C
			PM	17.5	B	17.8	B
10	REDWOOD PARKWAY & OAKWOOD AVENUE	Signalized	AM	42.0	D	43.5	D
			PM	12.6	B	13.0	B
11	REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	9.8	A	10.0	B
			PM	14.5	B	15.2	B
12	ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	26.0	C	26.4	C
			PM	40.9	D	34.1	C
13	FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	31.2	C	31.2	C
			PM	65.8	E	31.0	C
14	COLUMBUS PARKWAY & LAKE HERMAN ROAD	Signalized	AM	9.2	A	9.5	A
			PM	11.3	B	11.8	B
15	COLUMBUS PARKWAY & ROSE DRIVE	Signalized	AM	21.6	C	21.8	C
			PM	29.4	C	30.2	C
16	SONOMA BOULEVARD (SR-29) & SR-37 WB OFFRAMP	Signalized	AM	33.9	C	35.8	D
			PM	26.5	C	28.9	C

SOURCE: Abrams Associates, 2024 **NOTE:** Delay results are presented in terms of seconds per vehicle.

peak hours. Please note this scenario represents average weekday conditions that assume there is no event being held at the proposed theater. Friday conditions are analyzed in Section 4.11 and Friday Theater/Special Event conditions are analyzed in Section 4.12.

4.10 Cumulative Plus Project Queuing Conditions

A review was conducted of the 95th percentile queue lengths, as determined with Synchro software, to determine if the existing plus project queue lengths exceed the storage provided at the project study intersections. The instance of a queue exceeding available storage is not in itself a significant impact as the City has no significance criteria for queuing. However, project-related operational effects on queuing at an intersection are reported if project generated traffic causes the forecast queues to extend beyond the existing available turn pocket storage by more than one vehicle. When turn pocket storage is exceeded, safety and sight distance are reviewed to determine if improvements are warranted.

Please note that queue lengths for all approaches to the project study intersections under this scenario are reported in the detailed LOS calculations included in the technical appendix to this report. Based on a review of the cumulative plus project queue lengths there are three intersections where available storage is forecast to be exceeded during the AM and PM peak hours.

As shown in **Table 10**, at the intersection of Auto Mall Parkway with Admiral Callaghan Lane (Intersection #1) the eastbound left turn pocket has about 230 feet of storage and the calculations indicate the existing plus project queue length is forecast to be about 436 feet during the PM peak hour. As discussed in Section 5.0, the proposed mitigations to address the operations at this intersection are to widen Auto Mall Parkway to provide for a dual eastbound

TABLE 10
CUMULATIVE PEAK HOUR QUEUING ANALYSIS

ID	Intersection	Turn Lane	Available Storage (ft)	Period	95th % Queue (ft)		
					No Project	With Project	Delta
1	Auto Mall Parkway / Columbus Parkway & Admiral Callaghan Lane	EBL	230 ft	AM	22	193	171
				PM	42	403	361
		WBL	215 ft	AM	95	124	29
				PM	211	256	45
		NBL	425 ft	AM	135	180	45
				PM	444	660	216
		SBL	100 ft	AM	0	47	47
				PM	6	80	74
5	Admiral Callaghan Lane & Plaza Drive	EBL	250 ft	AM	45	46	1
				PM	99	101	2
		WBL	250 ft	AM	129	137	8
				PM	296	336	40
		NBL	200 ft	AM	32	33	1
				PM	114	116	2
		SBL	100 ft	AM	52	54	2
				PM	130	133	3
13	Redwood Street & Fairgrounds Drive / I-80 Southbound Ramps	EBL	160 ft	AM	100	101	1
				PM	125	125	0
		SBL	125 ft	AM	65	70	5
				PM	402	410	8

left turn movement. In addition, a right turn overlap phase (i.e., a green arrow for southbound traffic turning right out of the site towards I-80) would also be required. With the implementation of these mitigations the forecast queue for the eastbound left turn pocket under cumulative plus project conditions would be 219 feet.

The project is also forecast to contribute to queues that already exceed existing storage on the northbound and westbound left turns from Admiral Callaghan Lane at Intersection #1, the westbound and southbound left turn movements at Intersection #5, and the westbound and southbound left turn movements at Intersection #13. At Intersection #1 the queues would have the potential to create safety problems if they were to extend back into the SR 37/I-80 interchange. As discussed in Section 5.0, the proposed mitigation to address the queueing and intersection operations at Intersection #1 is to widen Auto Mall Parkway to provide for a dual eastbound left turn movement. In addition, a right turn overlap phase (i.e., a green arrow for southbound traffic turning right out of the site towards I-80) would also be required.

4.11 Friday Evening Cumulative Traffic Capacity Conditions

Traffic counts at all of the project study intersections were conducted from 4 PM to 10 PM on Friday, July 14th, 2023 and from 11:00 AM to 6:00 PM on Saturday July 15th, 2023. Saturday conditions were not analyzed as it was verified that the Friday evening counts provided the most conservative analysis because the counts indicated the Friday evening volumes were higher than the Saturday volumes at all of the project study intersections. The Friday evening peak hour recorded during the counts occurred from 5:00 PM to 6:00 PM. The same background and cumulative growth assumptions were applied but the project's trip generation was increased by 9% to account for Friday conditions, based on trip generation data from another recent casino study.[9] A table presenting the Friday trip generation is included in the technical appendix to this report. **Table 11** summarizes the associated LOS computation results for cumulative Friday PM peak hour conditions with and without the proposed project.

Please note that the corresponding LOS analysis calculation sheets for all analysis scenarios are presented in the appendix to this report. Friday Evening cumulative and cumulative plus project conditions are presented in **Table 11**. As shown in **Table 11**, all project study intersections would continue to have acceptable operations (LOS E or better) under cumulative plus project conditions during the Friday PM peak hours.

[9] *Traffic Evaluation of the Category 4 Casino*, David E. Wooster and Associates, Inc., Pittsburg, PA, February 25, 2021.

TABLE 11
FRIDAY EVENING CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	FRIDAY CUMULATIVE		FRIDAY CUMULATIVE PLUS PROJECT	
			Delay	LOS	Delay	LOS
1	AUTOMALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	33.6	C	76.5	E
2	AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY	Signalized	12.8	B	13.0	B
3	COLUMBUS PARKWAY & REDWOOD PARKWAY	Signalized	7.6	A	7.5	A
4	AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE	Signalized	26.6	C	29.3	C
5	PLAZA DRIVE & ADMIRAL CALLAGHAN LANE	Signalized	36.6	D	43.1	D
6	TURNER PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	20.7	C	23.1	C
7	PLAZA DRIVE & TURNER PARKWAY	Signalized	13.1	B	13.5	B
8	ASCOT PARKWAY & TURNER PARKWAY	Signalized	29.1	C	30.0	C
9	ASCOT PARKWAY & REDWOOD PARKWAY	Signalized	19.2	B	19.6	B
10	REDWOOD PARKWAY & OAKWOOD AVENUE	Signalized	15.8	B	16.3	B
11	REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	14.3	B	15.0	B
12	ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET	Signalized	43.7	D	38.3	D
13	FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET	Signalized	70.6	E	73.3	E
14	COLUMBUS PARKWAY & LAKE HERMAN ROAD	Signalized	8.8	A	9.3	A
15	COLUMBUS PARKWAY & ROSE DRIVE	Signalized	27.1	C	27.6	C
16	SONOMA BOULEVARD (SR-29) & SR-37 WB OFFRAMP	Signalized	37.8	D	41.1	D

SOURCE: Abrams Associates, 2024 **NOTE:** Delay results are presented in terms of seconds per vehicle.

4.12 Friday Evening Concert/Special Event Traffic Capacity Conditions

The proposed conference/event space would be approximately 52,794 square feet and could accommodate a maximum of 2,500 guests. A table presenting the resulting trip generation forecasts for the theater and the detailed LOS calculations are included in the technical appendix to this report. The LOS analysis of special event conditions was based on a full capacity event with an average of 2.21 persons per vehicle and it was conservatively assumed that 80% of the pre-event theater traffic would occur during the PM peak commute hour. The trip generation forecasts for theater traffic are based on data from the Tachi Palace Hotel and Casino Expansion Traffic Impact Study.[10]

Table 12 summarizes the associated LOS computation results for the cumulative and cumulative plus project Friday PM peak hour conditions with a sold-out special event. Please note that the corresponding LOS analysis calculation sheets for all analysis scenarios are presented in the appendix to this report. For this analysis the results are presented in **Table 12**. As shown in this table, all of the signalized study intersections would continue to have acceptable conditions during the weekday peak hours, with the exception of Auto Mall Parkway at Admiral Callaghan Lane and the project entrance (Intersection #1). The addition of traffic from the proposed project (plus a full capacity event at the theater) would cause the level of service standard to be exceeded at this intersection. Mitigations to improve the operations at this intersection are discussed in Section 5.

4.13 Transit Impacts

The project would not result in degradation of the level of service (or a significant increase in delay) on any roadway segments currently being utilized by bus transit in the area and, as such, no significant impacts to bus transit are expected. Soltrans ridership was still (as of 2023) at only about 50% of pre-pandemic ridership.[11] Soltrans local routes use buses with approximately 40 seats (varying by a couple seats) and based on ridership surveys conducted on Thursday June 27, 2024 on the three routes that serve the site (Routes 7A, 7B, and 38) none of them are currently operating above 30% capacity. Therefore, the proposed project would not be expected to significantly impact the operating capacity any existing SolTrans bus routes. Although the proposed project does have the potential to increase patronage on bus lines in the area, no significant effects on transit capacity are anticipated given that the additional ridership would be added primarily in the non-peak directions. As a result, the project would not be expected to result in any significant impacts to bus transit service in the area.

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[10] *Tachi Palace Hotel and Casino Expansion Project Traffic Impact Study*, VRPA Technologies Inc., Fresno, CA, May, 2020. [5]
[11] *SolTrans Short Range Transit Plan - 2022 Update*, Moore & Associates, Inc., Valencia, CA, 2022.

TABLE 12
FRIDAY CUMULATIVE PLUS PROJECT AND SPECIAL EVENT INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	FRIDAY CUMULATIVE		FRIDAY CUMULATIVE PLUS PROJECT PLUS THEATER	
			Delay	LOS	Delay	LOS
1	AUTOMALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	33.6	C	**107.5**	**F**
2	AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY	Signalized	12.8	B	13.1	B
3	COLUMBUS PARKWAY & REDWOOD PARKWAY	Signalized	7.6	A	7.4	A
4	AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE	Signalized	26.6	C	31.3	C
5	PLAZA DRIVE & ADMIRAL CALLAGHAN LANE	Signalized	36.6	D	47.8	D
6	TURNER PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	20.7	C	24.8	C
7	PLAZA DRIVE & TURNER PARKWAY	Signalized	13.1	B	13.8	B
8	ASCOT PARKWAY & TURNER PARKWAY	Signalized	29.1	C	30.1	C
9	ASCOT PARKWAY & REDWOOD PARKWAY	Signalized	19.2	B	19.8	B
10	REDWOOD PARKWAY & OAKWOOD AVENUE	Signalized	15.8	B	16.6	B
11	REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	14.3	B	15.4	B
12	ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET	Signalized	43.7	D	50.6	D
13	FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET	Signalized	70.6	E	73.5	E
14	COLUMBUS PARKWAY & LAKE HERMAN ROAD	Signalized	8.8	A	9.6	A
15	COLUMBUS PARKWAY & ROSE DRIVE	Signalized	27.1	C	27.9	C
16	SONOMA BOULEVARD (SR-29) & SR-37 WB OFFRAMP	Signalized	37.8	D	42.5	D

SOURCE: Abrams Associates, 2024 **NOTE:** Delay results are presented in terms of seconds per vehicle.

4.14 Pedestrians, Bicycles and Non-Motorized Vehicular Travel

The City does not have level of service standards for pedestrian or bicycle facilities. Nevertheless, use of existing facilities by the users of the project would not be expected to overcrowd those facilities or decrease their performance or safety. The project will add some pedestrians and bicyclists in the area but the volumes added would not be expected to significantly impact any existing facilities. In relation to the existing conditions, the proposed project would not cause substantial changes to the pedestrian or bicycle traffic in the area and would not significantly impact or require changes to the design of any existing bicycle or pedestrian facilities.

4.15 Site Access and Circulation

Based on the analysis of the proposed project with an event at the conference/event space, it was determined that excessive queuing could occur without improvements to the intersection of Auto Mall Parkway with Admiral Callaghan Lane and the proposed project entrance. At this intersection a dual eastbound left turn movement would be required for project ingress and a right turn overlap phase (a green arrow for traffic exiting the site towards I-80) would be required for egress to address the potential for significant on-site queuing after special events. The project would implement a Traffic Control Plan for any major special events at the theater. No other site circulation or access issues have been identified that would cause a traffic safety problem or any unusual traffic congestion or delay. Detailed LOS calculations for each of the project entrances under all scenarios are included in the appendix.

Sufficient emergency access is determined by factors such as number of access points, roadway width, and proximity to fire stations. The land use plan for the proposed project would include a main entrance on Auto Mall Parkway along with a secondary entrance for emergency vehicles only. All lane widths within the project would meet the minimum width that can accommodate an emergency vehicle; therefore, the width of the internal roadways would be adequate. In addition, with the above recommended improvements the addition of traffic from project traffic would not be forecast to result in any significant changes to emergency vehicle response times in the area. Therefore, subject to approval from the City and the fire department, the development of the proposed project is expected to have less-than-significant impacts regarding emergency vehicle access.

4.16 Parking

The proposed project would provide an adequate supply of off-street parking based on the City's requirements. The project is currently proposing to meet the City's parking requirements and based on a review of the proposed parking plan there would be no significant parking impacts expected to the surrounding properties.

4.17 Analysis of Alternative B – Reduced Intensity Alternative

Alternative B Trip Generation - This analysis evaluated the Reduced Intensity Alternative which consists of the same casino project but without the Tribal Housing and Offices. The proposed site plan for Alternative B is shown in **Figure 11**. The resulting trip generation calculations are shown in **Table 13**, using the trip generation methodology outlined in Section 4.1. The total trip generation reflects all vehicle trips at the project driveway.

TABLE 13
REDUCED INTENSITY ALTERNATIVE TRIP GENERATION CALCULATIONS

Land Use	Size	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Tribal Casino Trip Rates - Trips per Square Feet		38.31	1.30	0.77	2.07	1.90	1.55	3.45
Unadjusted Casino Trip Generation		9,128	311	182	493	452	370	822
Pass-By Traffic Reduction (10%)		913	31	18	49	45	37	82
Total Project Trip Generation	**238,266 sq. ft.**	**8,215**	**280**	**164**	**444**	**407**	**333**	**740**

For the purposes of determining the worst-case impacts on the surrounding streets, the trips generated by this proposed development are estimated for the peak commute hours of 8:00 a.m. to 9:00 a.m. and 4:30 p.m. to 5:30 p.m., representing the peak of "*adjacent street traffic*". The Reduced Intensity Alternative is estimated to generate 444 a.m. peak-hour trips (280 inbound and 164 outbound) and 740 p.m. peak-hour trips (407 inbound and 333 outbound).

Alternative B Trip Distribution - The trip distribution assumptions have been based on the project's proximity to the access freeway and other key travel routes in Solano County, the existing directional split at nearby intersections, and engineering judgement considering the overall land use patterns in the area. The distribution percentages assumed for Alternative B are the same as for the proposed project, which are presented in Figure A-1 in the technical appendix to this report. **Figure 12** shows the traffic that would be added at each of the study intersections under Alternative B.

Cumulative Plus Alternative B Traffic Capacity Conditions – Table 14 summarizes the LOS results for the Cumulative Plus Project (Year 2045) traffic conditions at each of the project study are summarized in Table 14. **Figure 13** presents the cumulative build-out traffic volumes including the traffic from the Alternative B. As shown in **Table 14**, all of the study intersections would continue to have acceptable conditions during the cumulative weekday AM and PM peak commute hours. It should be noted that the cumulative scenario provides the most conservative analysis results and the existing and baseline scenarios were verified to also have no impacts.

FIGURE 11 | ALTERNATIVE B REDUCED INTENSITY ALTERNATIVE SITE PLAN
TRANSPORTATION IMPACT ANALYSIS
Scotts Valley Development Project
City of Vallejo

Abrams Associates
TRAFFIC ENGINEERING, INC.

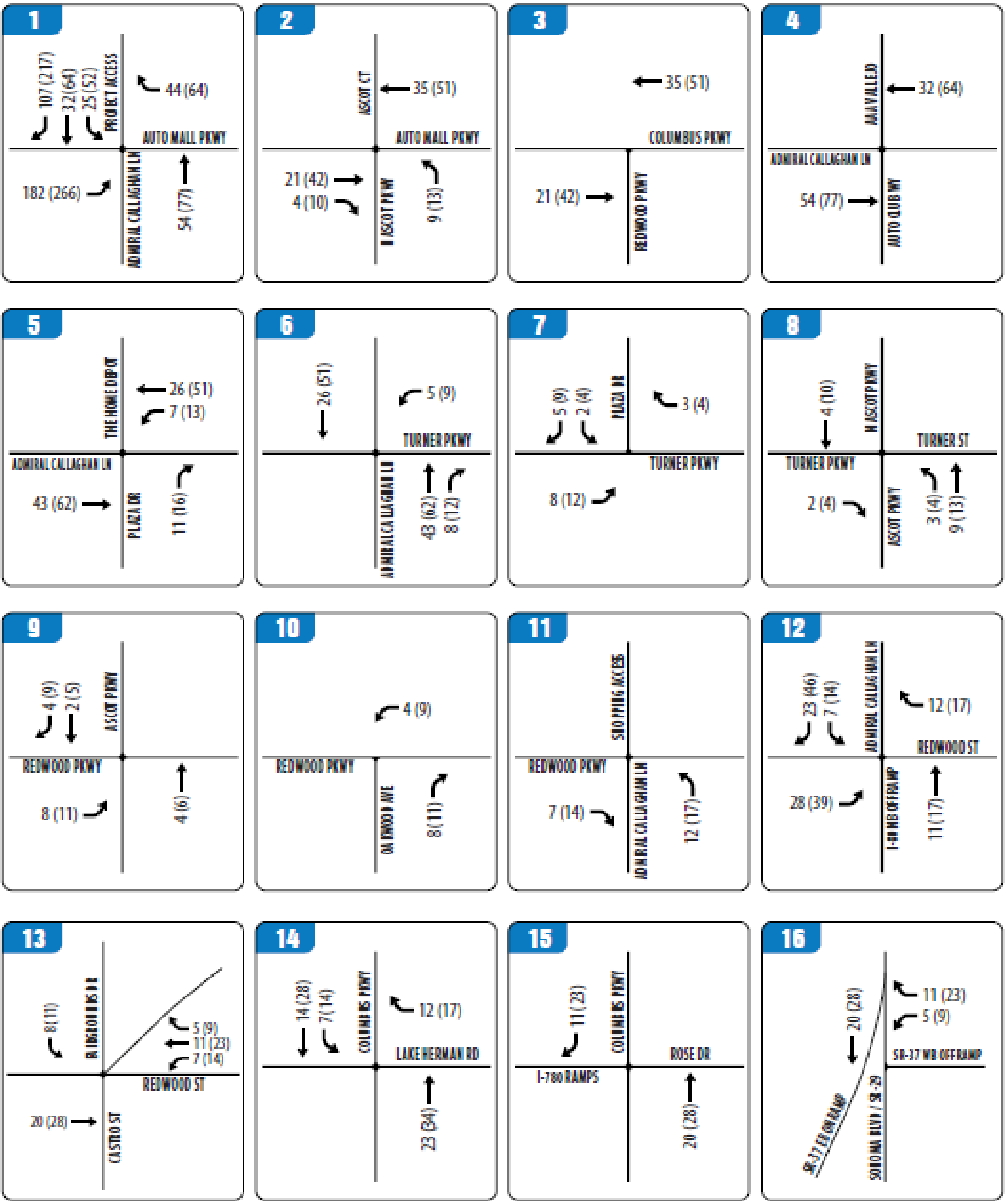

FIGURE 12 | ALTERNATIVE B AM(PM) PEAK HOUR TRIPS

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates
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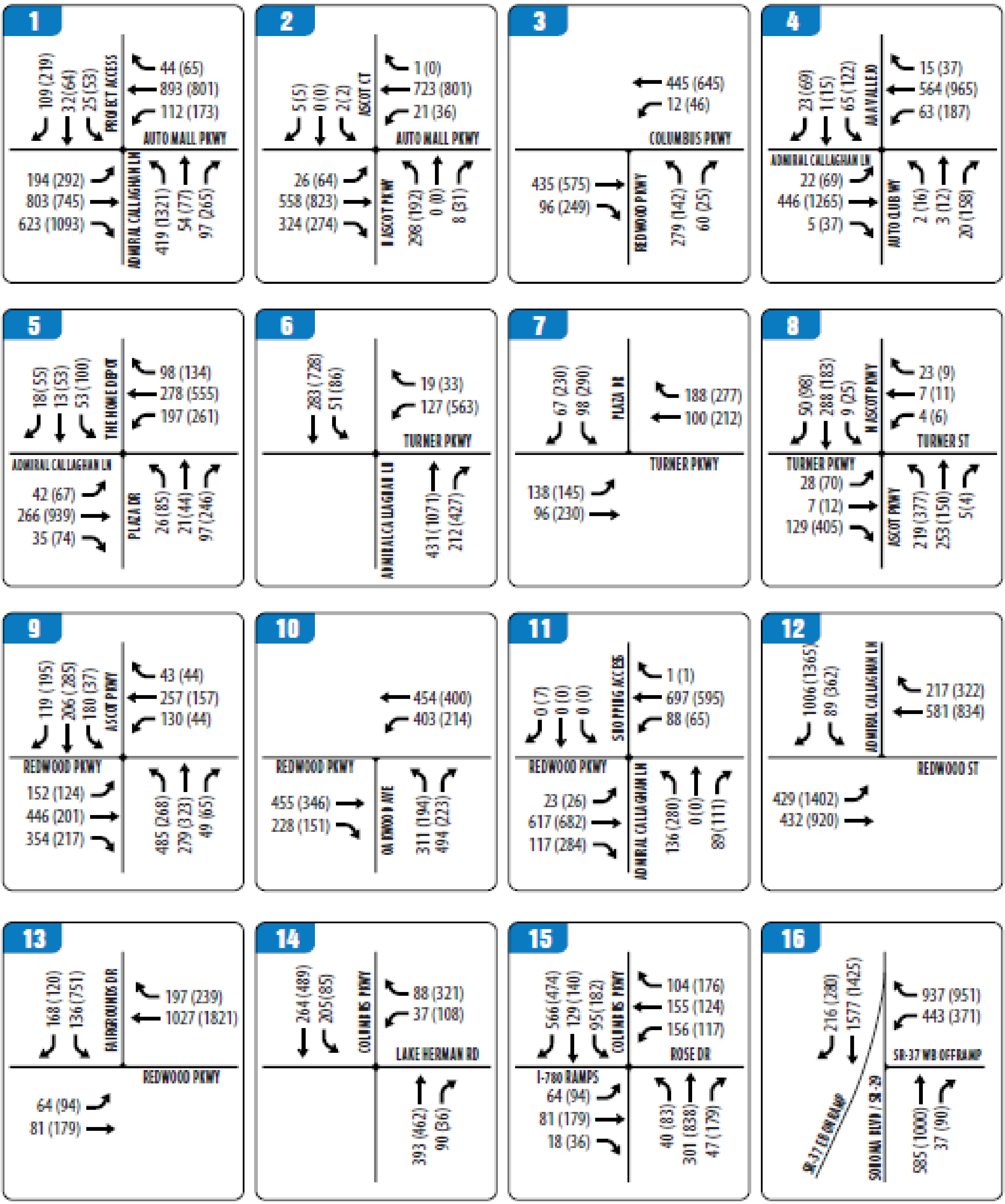

FIGURE 13 | ALT B CUMULATIVE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates
TRAFFIC ENGINEERING, INC.

TABLE 14
CUMULATIVE PLUS ALTERNATIVE B INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	AUTOMALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	14.0	B	21.4	C
			PM	32.0	C	73.9	E
2	AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY	Signalized	AM	12.8	B	13.0	B
			PM	13.0	B	13.2	B
3	COLUMBUS PARKWAY & REDWOOD PARKWAY	Signalized	AM	8.9	A	8.9	A
			PM	7.7	A	7.6	A
4	AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	8.3	A	8.3	A
			PM	22.3	C	24.0	C
5	PLAZA DRIVE & ADMIRAL CALLAGHAN LANE	Signalized	AM	16.1	B	16.4	B
			PM	32.4	C	37.3	D
6	TURNER PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	7.8	A	7.8	A
			PM	19.1	B	20.9	C
7	PLAZA DRIVE & TURNER PARKWAY	Signalized	AM	9.9	A	10.1	B
			PM	12.0	B	12.4	B
8	ASCOT PARKWAY & TURNER PARKWAY	Signalized	AM	14.9	B	14.9	B
			PM	28.1	C	28.8	C
9	ASCOT PARKWAY & REDWOOD PARKWAY	Signalized	AM	28.1	C	28.2	C
			PM	17.5	B	17.8	B
10	REDWOOD PARKWAY & OAKWOOD AVENUE	Signalized	AM	42.0	D	43.5	D
			PM	12.6	B	13.0	B
11	REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	9.8	A	10.0	B
			PM	14.5	B	15.2	B
12	ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	26.0	C	26.4	C
			PM	40.9	D	34.1	C
13	FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	31.2	C	31.2	C
			PM	65.8	E	31.0	C
14	COLUMBUS PARKWAY & LAKE HERMAN ROAD	Signalized	AM	9.2	A	9.5	A
			PM	11.3	B	11.8	B
15	COLUMBUS PARKWAY & ROSE DRIVE	Signalized	AM	21.6	C	21.8	C
			PM	29.4	C	30.2	C
16	SONOMA BOULEVARD (SR-29) & SR-37 WB OFFRAMP	Signalized	AM	33.9	C	35.8	D
			PM	26.5	C	28.9	C

SOURCE: Abrams Associates, 2024 **NOTE:** Delay results are presented in terms of seconds per vehicle.

4.18 Analysis of Alternative C – Non-Gaming Alternative

Alternative C Trip Generation - This analysis also included evaluation of a development alternative that would involve construction of 50 tribal residences and three Tribal administration buildings with a total of 23,353 square feet of building space. This alternative would also include two commercial buildings with a total of 129,702 square feet of building space and two hotel buildings with a total of 264 hotel rooms. The proposed site plan for Alternative C is shown in **Figure 14**. The resulting trip generation calculations are shown in **Table 15**, using the trip generation methodology outlines in Section 4.1. For the hotel and shopping center uses the peak hour trip generation was based on trip rates published in Institute of Transportation Engineers (ITE) Trip Generation Manual (Eleventh Edition, 2021).

FIGURE 14 | ALTERNATIVE C NON GAMING ALTERNATIVE SITE PLAN
TRANSPORTATION IMPACT ANALYSIS
Scotts Valley Development Project
City of Vallejo

Abrams Associates
TRAFFIC ENGINEERING, INC.

TABLE 15
NON-GAMING ALTERNATIVE TRIP GENERATION CALCULATIONS

Land Use	Size	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
ITE Single Family Detached Housing Trip Rates - Trips per Unit		7.92	0.18	0.59	0.77	0.53	0.31	0.84
Tribal Housing Trip Generation	**50 units**	**396**	**9**	**30**	**39**	**26**	**16**	**42**
ITE General Office Building Trip Rates - Trips per Unit		15.20	0.84	0.11	0.95	0.40	1.96	2.36
Tribal Offices Trip Generation		355	19	3	22	9	46	55
Shared Traffic Reduction (50%)		177	10	1	11	5	23	28
Net New Off-Site Tribal Offices Trip Generation	**23,353 sq. ft.**	**177**	**10**	**1**	**11**	**5**	**23**	**28**
ITE Shopping Center Trip Rates - Trips per Unit		67.52	0.80	0.93	1.73	2.54	2.65	5.19
Commercial Trip Generation		8,757	104	120	224	330	343	673
Pass-By Traffic Reduction (34%)		5,780	68	79	148	218	227	444
Net New Off-Site Commercial Trip Generation	**129,702 sq. ft.**	**2,978**	**69**	**55**	**124**	**85**	**81**	**166**
ITE Hotel Trip Rates - Trips per Room		9.24	0.26	0.21	0.47	0.32	0.31	0.63
Hotel Trip Generation		**2,439**	**69**	**55**	**124**	**85**	**81**	**166**
Total Project Trip Generation		**5,990**	**123**	**126**	**249**	**228**	**237**	**465**

The pass-by reduction for the shopping center was based on the standard reduction as specified in the ITE Trip Generation Handbook (3rd, Edition, September, 2017). The total trip generation reflects all vehicle trips that would be counted at the project driveway. For the purposes of determining the worst-case impacts on the surrounding streets, the trips generated by this proposed development are estimated for the peak commute hours of 8:00 a.m. to 9:00 a.m. and 4:30 p.m. to 5:30 p.m., representing the peak hours of "*adjacent street traffic*". The Reduced Intensity Alternative is estimated to generate a total of 249 a.m. peak-hour trips (123 inbound and 126 outbound) and 465 p.m. peak-hour trips (228 inbound and 237 outbound).

Alternative C Trip Distribution - The trip distribution assumptions have been based on the project's proximity to the access freeway and other key travel routes in Solano County, the existing directional split at nearby intersections, and engineering judgement considering the overall land use patterns in the area. The distribution percentages assumed for Alternative B are the same as for the proposed project, which are presented in Figure A-1 in the technical appendix to this report. **Figure 15** shows the traffic that would be added at each of the study intersections under Alternative C.

Cumulative Plus Alternative C Traffic Capacity Conditions - The LOS results for the Cumulative Plus Project (Year 2045) traffic conditions at each of the project study intersections are summarized in **Table 16**. **Figure 16** presents the cumulative build-out traffic volumes including the traffic from the Alternative C. As shown in **Table 16**, all of the study intersections would continue to have acceptable conditions during the cumulative weekday AM and PM peak commute hours. It should be noted that the cumulative scenario provides the most conservative analysis results and the existing and baseline scenarios were verified to also have no impacts.

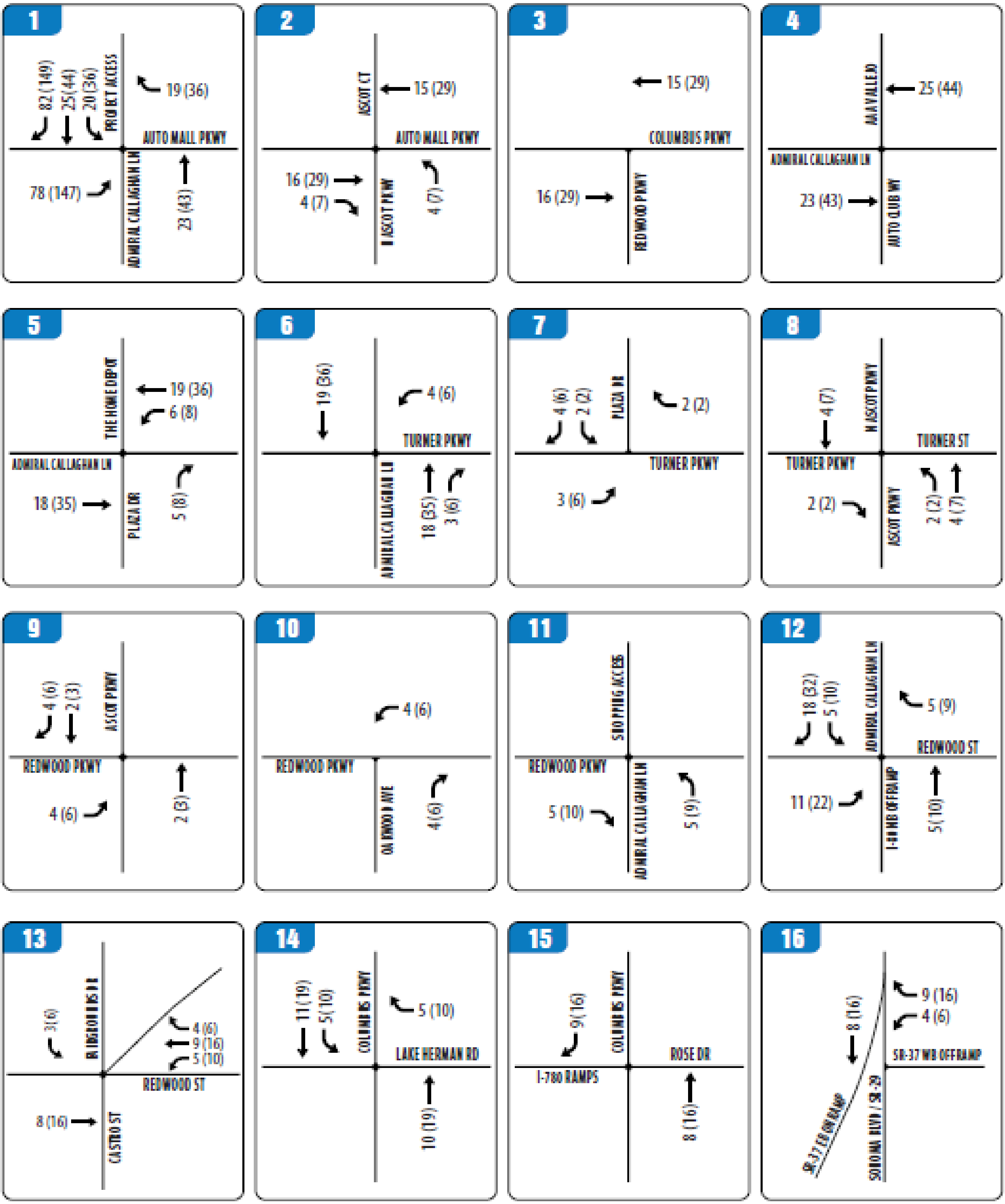

FIGURE 15 | ALTERNATIVE C AM(PM) PEAK HOUR TRIPS

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates
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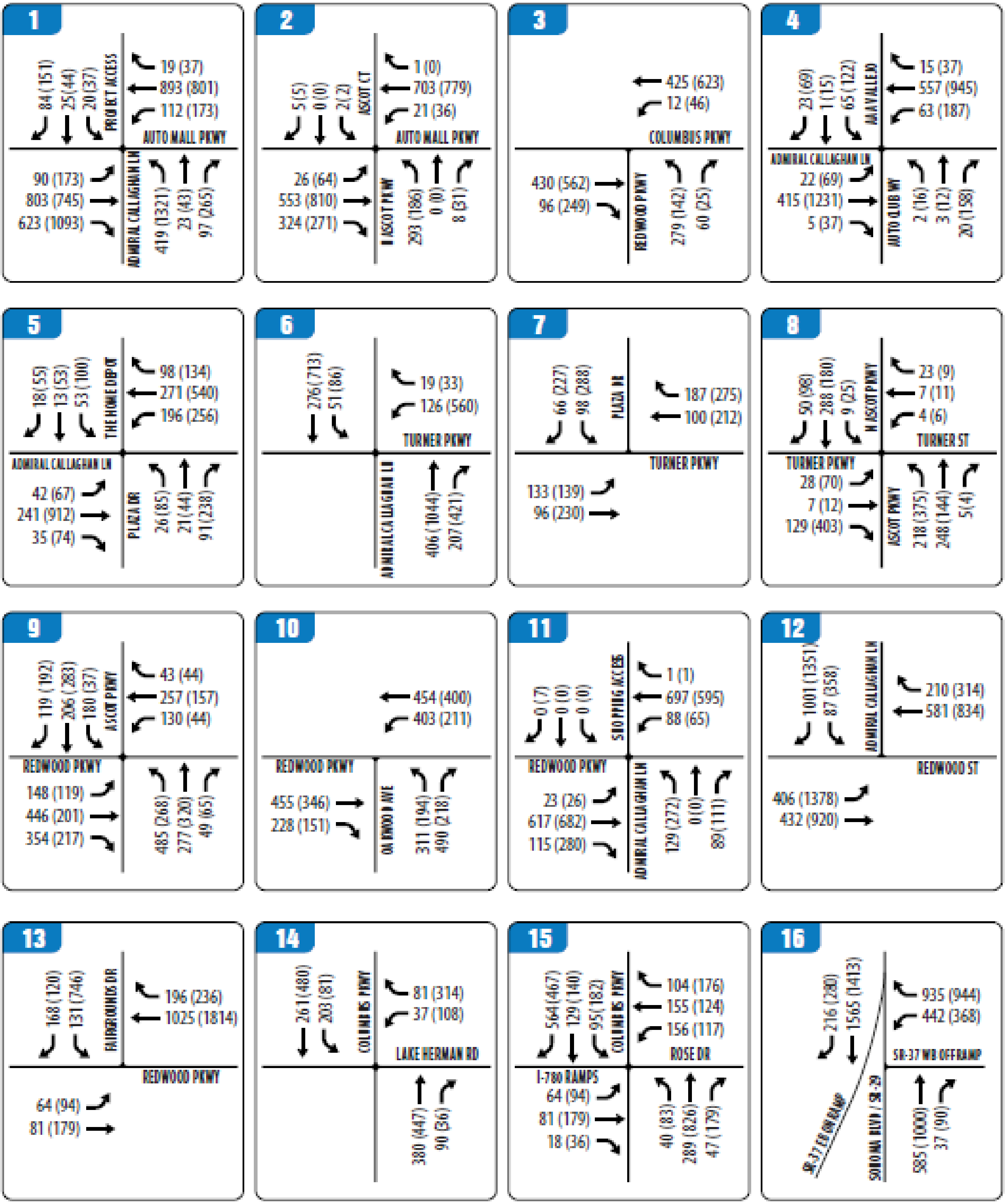

FIGURE 16 | ALT C CUMULATIVE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates
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TABLE 16
CUMULATIVE PLUS ALTERNATIVE C INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS ALT C	
				Delay	LOS	Delay	LOS
1	AUTOMALL / COLUMBUS PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	14.0	B	18.6	B
			PM	32.0	C	53.1	D
2	AUTOMALL / COLUMBUS PARKWAY & N ASCOT PARKWAY	Signalized	AM	12.8	B	12.9	B
			PM	13.0	B	13.1	B
3	COLUMBUS PARKWAY & REDWOOD PARKWAY	Signalized	AM	8.9	A	8.9	A
			PM	7.7	A	7.6	A
4	AUTO CLUB WAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	8.3	A	8.2	A
			PM	22.3	C	23.1	C
5	PLAZA DRIVE & ADMIRAL CALLAGHAN LANE	Signalized	AM	16.1	B	16.2	B
			PM	32.4	C	34.9	C
6	TURNER PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	7.8	A	8.0	A
			PM	19.1	B	20.1	C
7	PLAZA DRIVE & TURNER PARKWAY	Signalized	AM	9.9	A	11.0	B
			PM	12.0	B	12.2	B
8	ASCOT PARKWAY & TURNER PARKWAY	Signalized	AM	14.9	B	14.9	B
			PM	28.1	C	28.5	C
9	ASCOT PARKWAY & REDWOOD PARKWAY	Signalized	AM	28.1	C	28.1	C
			PM	17.5	B	17.6	B
10	REDWOOD PARKWAY & OAKWOOD AVENUE	Signalized	AM	42.0	D	42.9	D
			PM	12.6	B	12.8	B
11	REDWOOD PARKWAY & ADMIRAL CALLAGHAN LANE	Signalized	AM	9.8	A	9.9	A
			PM	14.5	B	14.9	B
12	ADMIRAL CALLAGHAN LANE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	26.0	C	26.3	C
			PM	40.9	D	43.9	D
13	FAIRGROUNDS DRIVE / I-80 OFFRAMP & REDWOOD STREET	Signalized	AM	31.2	C	31.2	C
			PM	65.8	E	67.5	E
14	COLUMBUS PARKWAY & LAKE HERMAN ROAD	Signalized	AM	9.2	A	9.3	A
			PM	11.3	B	11.6	B
15	COLUMBUS PARKWAY & ROSE DRIVE	Signalized	AM	21.6	C	21.8	C
			PM	29.4	C	28.8	C
16	SONOMA BOULEVARD (SR-29) & SR-37 WB OFFRAMP	Signalized	AM	33.9	C	34.9	C
			PM	26.5	C	27.9	C

SOURCE: Abrams Associates, 2024 **NOTE:** Delay results are presented in terms of seconds per vehicle.

5) MITIGATION

The following is a summary of the proposed mitigation measures to address the transportation impacts of the project. Based on a detailed analysis of traffic operations with and without each of the proposed mitigations, implementation of the following mitigation measures would reduce some of the project impacts to a *less-than-significant* level.

Impact #1 Impacts to intersection operations - The project would contribute to LOS operations exceeding the established standards at the following intersection under future Friday conditions (Significant and Unavoidable):

Auto Mall Parkway at Admiral Callaghan Lane (Intersection #1)

The addition of traffic from the proposed project would contribute to this intersection exceeding the established LOS standards. The proposed mitigation (MM 1) would be required for the anticipated 2028 opening of the project, and would also be required for a 2028 opening of the project under Alternative B. For Alternative C, no LOS or queuing impacts were identified for the existing and baseline scenarios. However, mitigation measure #1 would still be required to address queuing under Cumulative Plus Project conditions for Alternative C. The proposed mitigation measure would be forecast to sufficiently mitigate both the LOS and queuing to acceptable levels in all plus project scenarios.

<u>Mitigation Measures</u>

MM 1 *<u>Auto Mall Parkway at Admiral Callaghan Lane and the Proposed Project Entrance</u> – Widen Auto Mall Parkway to provide for a dual eastbound left turn movement. At this intersection a right turn overlap phase (i.e., a green arrow for southbound traffic turning right out of the site towards I-80) would also be required for traffic to exit the site efficiently. This mitigation is required for all alternatives except for Alternative C, where it is only required for cumulative plus project conditions.*

Impact #2 Impacts related to conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or potential decreases to the performance or safety of such facilities.

The project would not result in degradation of the level of service (or a significant increase in delay) on any roadways currently being utilized by bus transit in the area and would not increase ridership beyond existing capacity. Soltrans local routes use buses with approximately 40 seats (varying by a couple seats) and based on surveys conducted of ridership on the three routes that serve the site

(Routes 7A, 7B, and 38) none of them are currently operating above 50% capacity. As such, no significant impacts to bus transit are expected. In addition, the project would not significantly impact or change the design of any existing transportation facility or create any new safety problems in the area. Therefore, the project's impacts on alternative transportation would be considered less than significant and no mitigations would be required.

<u>Mitigation Measure(s)</u>
None required.

Impact #3 Demolition and construction activities associated with the proposed project would result in an increase in traffic to and from the site and could lead to unsafe conditions near the project site.

The increase in traffic as a result of demolition and construction activities associated with the proposed project has been quantified assuming a worst-case single phase construction period of 18 months.

Heavy Equipment

Approximately 30 truck trips per day are estimated throughout the demolition and construction of the proposed project. Heavy equipment transport to and from the site could cause traffic impacts in the vicinity of the project site during construction. The project would implement a Traffic Control Plan. The requirements within the Traffic Control Plan include, but are not limited to, the following: truck drivers would be notified of and required to use the most direct routes; all site ingress and egress would occur only at the main driveway to the project site and construction activities may require installation of temporary traffic signals; specifically designated travel routes for large vehicles would be monitored and controlled by flaggers for large construction vehicle ingress and egress; warning signs indicating frequent truck entry and exit would be posted on Auto Mall Parkway; and any debris and mud on nearby streets caused by trucks would be monitored daily and may require instituting a street cleaning program. In addition, the ten loads of heavy equipment being hauled to and from the site each month would be short-term and temporary and, with implementation of a traffic control plan, the resulting impacts would therefore be considered less than significant.

Employees

The weekday work is expected to begin around 7:00 AM and end around 4:00 PM. The construction worker arrival peak would occur between 6:30 AM and 7:30 AM, and the departure peak would occur between 4:00 PM and 5:00 PM. These peak hours are slightly before the countywide commute peaks. It should be noted that the number of trips generated during construction would not only be temporary, but would also be substantially less than the proposed project at buildout. Based on estimates of the number of construction workers (about 500), it is conservatively assumed the project could require parking for up to 500 worker vehicles during the peak construction period. Additionally, deliveries, visits, and other activities may generate peak non-worker parking demand of 40 to 50 trucks and automobiles per day. Therefore, up to 550 vehicle parking spaces may be required during the peak construction period for the construction employees. Because the construction of the project can be staged so that employee parking demand is met by using on-site parking, the impacts of construction-related employee traffic and parking are considered less-than-significant.

Construction Material Import/Export

The project would also require removal of existing debris as well as the importation of construction material, including raw materials for the building pads, the buildings, the parking area, and landscaping. During the maximum peak construction period, it is estimated material import and export could generate approximately 100 truck trips per day. These trips would be short-term and temporary and, with implementation of a traffic control plan, the resulting impacts would therefore be considered less than significant.

Traffic Control Plan

The Traffic Control Plan would indicate how parking for construction workers would be provided during construction to ensure a safe flow of traffic in the project area during construction. This analysis assumed construction of the entire project in one phase to identify the potential worst-case traffic effects. If the project is built in phases over time, the effects of each phase will be the same or less. Therefore, the demolition and construction activities associated with the proposed project or its individual phases would not lead to noticeable congestion in the vicinity of the site or the perception of decreased traffic safety resulting in a ***less-than-significant*** impact.

<u>Mitigation Measure(s)</u>
None required.

Impact #4 Impacts related to site access and circulation.

Based on the analysis of the proposed project under Friday conditions, it was determined that excessive queuing could occur without improvements to at the project entrance intersection with Auto Mall Parkway and Admiral Callaghan Lane. The queuing analysis for Alternatives B and C (included in the technical appendix) verified that this queuing problem would also occur with both of the alternatives. The queuing problem was identified to occur under all scenarios for Alternative B, but it would only be required under cumulative conditions for Alternative C. The recommended improvement includes widening Auto Mall Parkway to allow for a dual westbound left turn movement into the site and a right turn overlap phase (a green arrow for traffic leaving the site towards I-80). This mitigation would address both the LOS impacts and also the potential for queuing problems before and after special events. The project would implement a Traffic Control Plan for any major special events at the theater. No other site circulation or access issues have been identified that would cause a traffic safety problem or any unusual traffic congestion or delay. Detailed LOS calculations for the project entrance under all scenarios are included in the technical appendix.

Mitigation Measure(s)

MM 1 (a) *Auto Mall Parkway at Admiral Callaghan Lane and the Proposed Project Entrance – Widen Auto Mall Parkway to provide for a dual eastbound left turn movement. At this intersection a right turn overlap phase (i.e., a green arrow for southbound traffic turning right out of the site towards I-80) would also be required for traffic to exit the site efficiently.*

Impact #5 Impacts regarding emergency vehicle access on and surrounding the proposed project site.

Sufficient emergency access is determined by factors such as number of access points, roadway width, and proximity to fire stations. The land use plan for the proposed project includes a main entrance and a secondary entrance on Auto Mall Parkway. All lane widths within the project would meet the minimum width (10 feet) that can accommodate an emergency vehicle; therefore, the width of the internal roadways would be adequate. In addition, with the proposed mitigations the addition of traffic from project traffic would not result in any significant changes to emergency vehicle response times in the area. Therefore, development of the project is expected to have ***less-than-significant*** impacts regarding emergency vehicle access.

Mitigation Measure(s)

None required.

Transportation Impact Analysis Technical Appendix

Scotts Valley Development Project

City of Vallejo

Prepared by:
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Walnut Creek CA 94596

Abrams Associates
TRAFFIC ENGINEERING, INC.

July 3, 2024

Appendix
Table of Contents

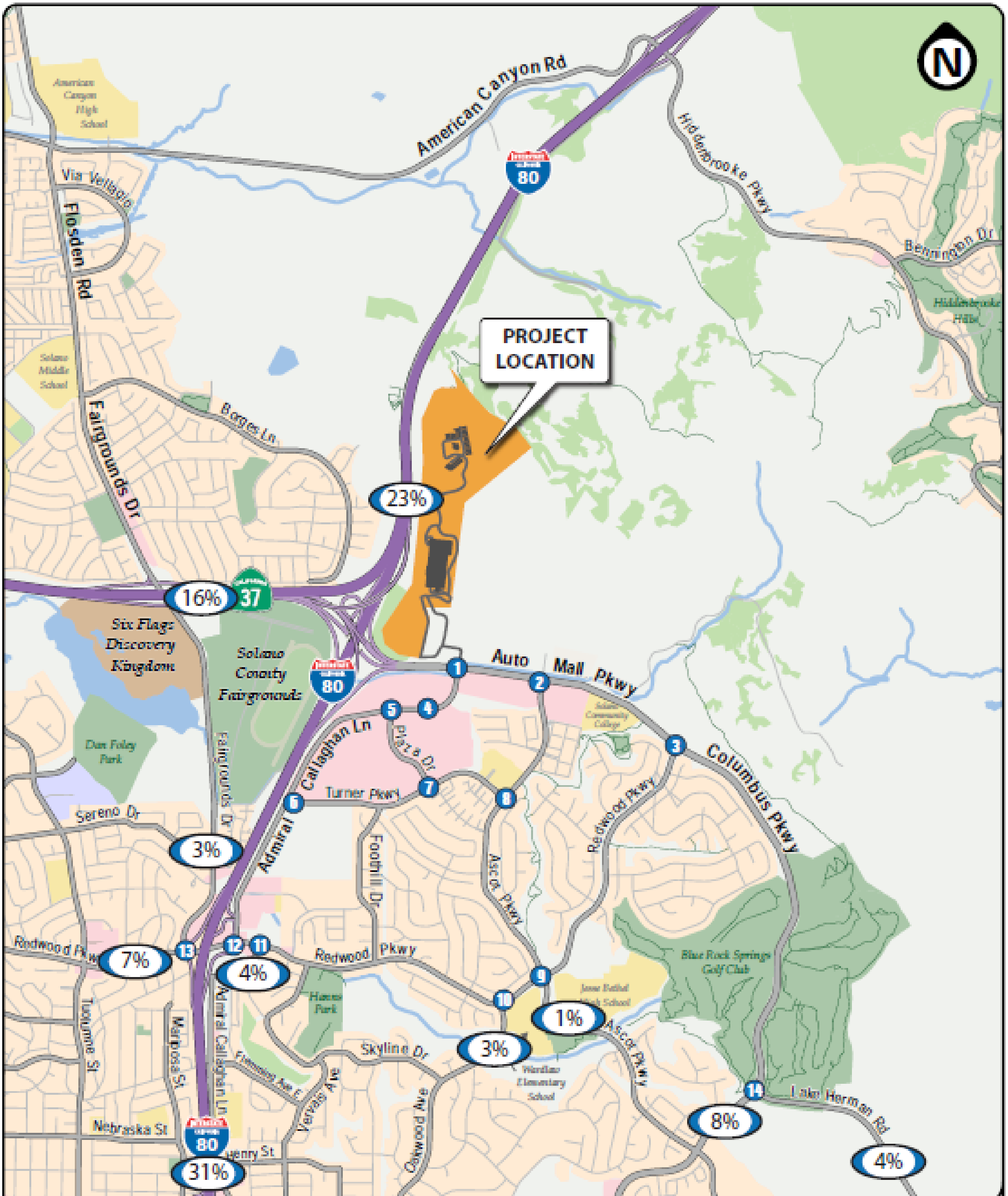

FIGURE A1 | PROJECT TRIP DISTRIBUTION

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates
TRAFFIC ENGINEERING, INC.

TABLE A1
FRIDAY TRIP GENERATION CALCULATIONS

Land Use	Size	PM Peak Hour		
		In	Out	Total
Tribal Casino Trip Rates - Trips per Square Foot		2.07	1.69	3.76
Unadjusted Casino Trip Generation	**238,266 sq. ft.**	493	403	896
Pass-By Traffic Reduction (10%)		50	40	90
Net New Off-Site Casino Trip Generation		**50**	**40**	**90**
ITE Single Family Detached Housing Trip Rates - Trips per Unit		0.60	0.35	0.95
Tribal Housing Trip Generation	**24 units**	**15**	**8**	**23**
ITE General Office Building Trip Rates - Trips per Square Foot		0.40	1.96	2.36
Tribal Offices Trip Generation	**12,555 sq. ft.**	5	25	30
Shared Traffic Reduction (50%)		3	12	15
Net New Off-Site Tribal Offices Trip Generation		**2**	**13**	**15**
Total Project Trip Generation		**460**	**384**	**844**

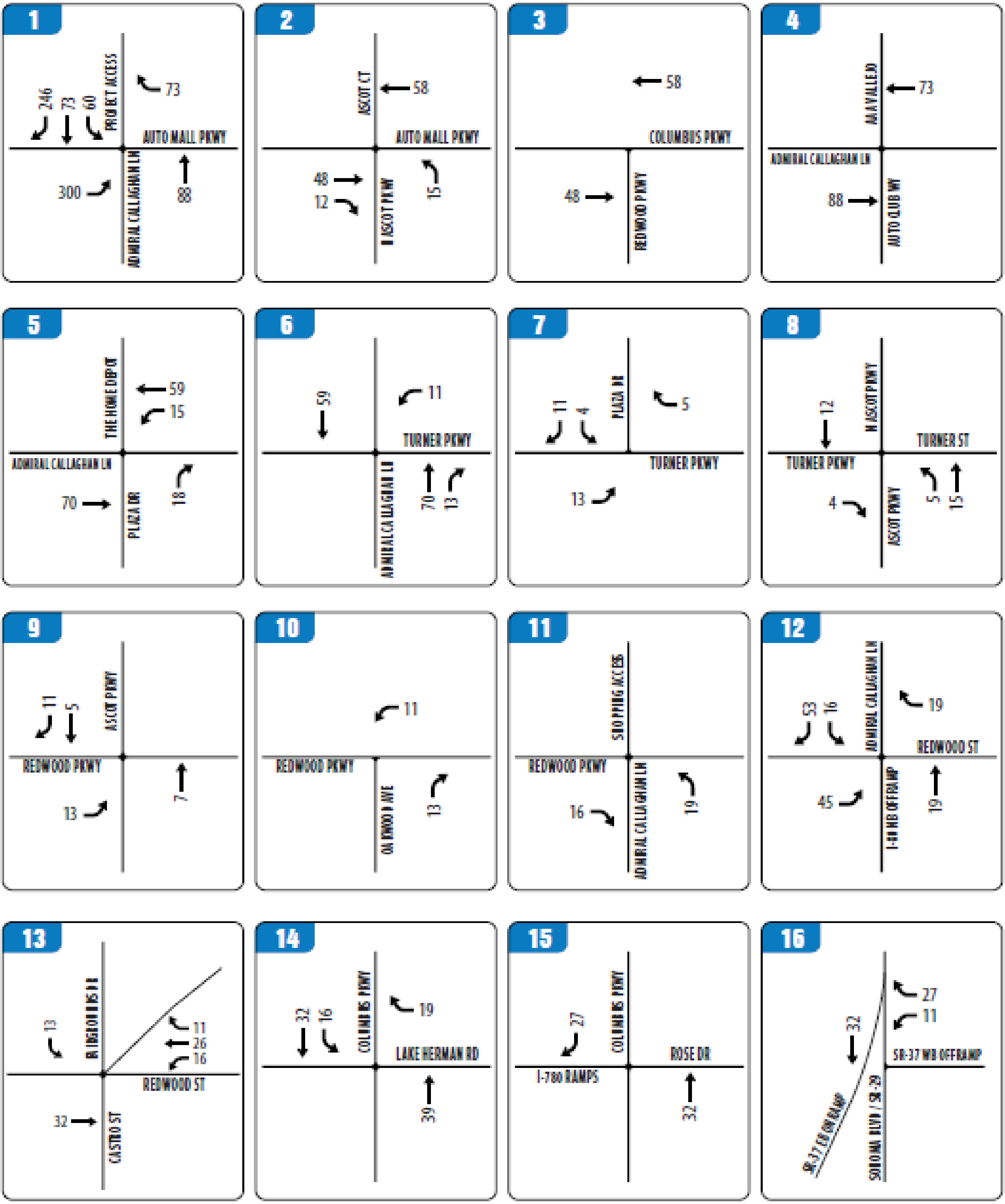

FIGURE A2 | FRIDAY PM PEAK HOUR TRIPS

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Development Project

City of Vallejo

Abrams Associates
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TABLE A2
SPECIAL EVENT TRIP GENERATION CALCULATIONS

Land Use	Size	PM Peak Hour		
		In	Out	Total
Special Event Trip Rates - Trips per Square Feet		0.02	0.21	0.23
Special Event Trip Generation	2,500 seats	529	46	575
Peak Hour Traffic (80% of total)		423	37	460
Casino Shared Traffic (25%)		106	9	115
Special Event Trip Generation		**317**	**28**	**345**

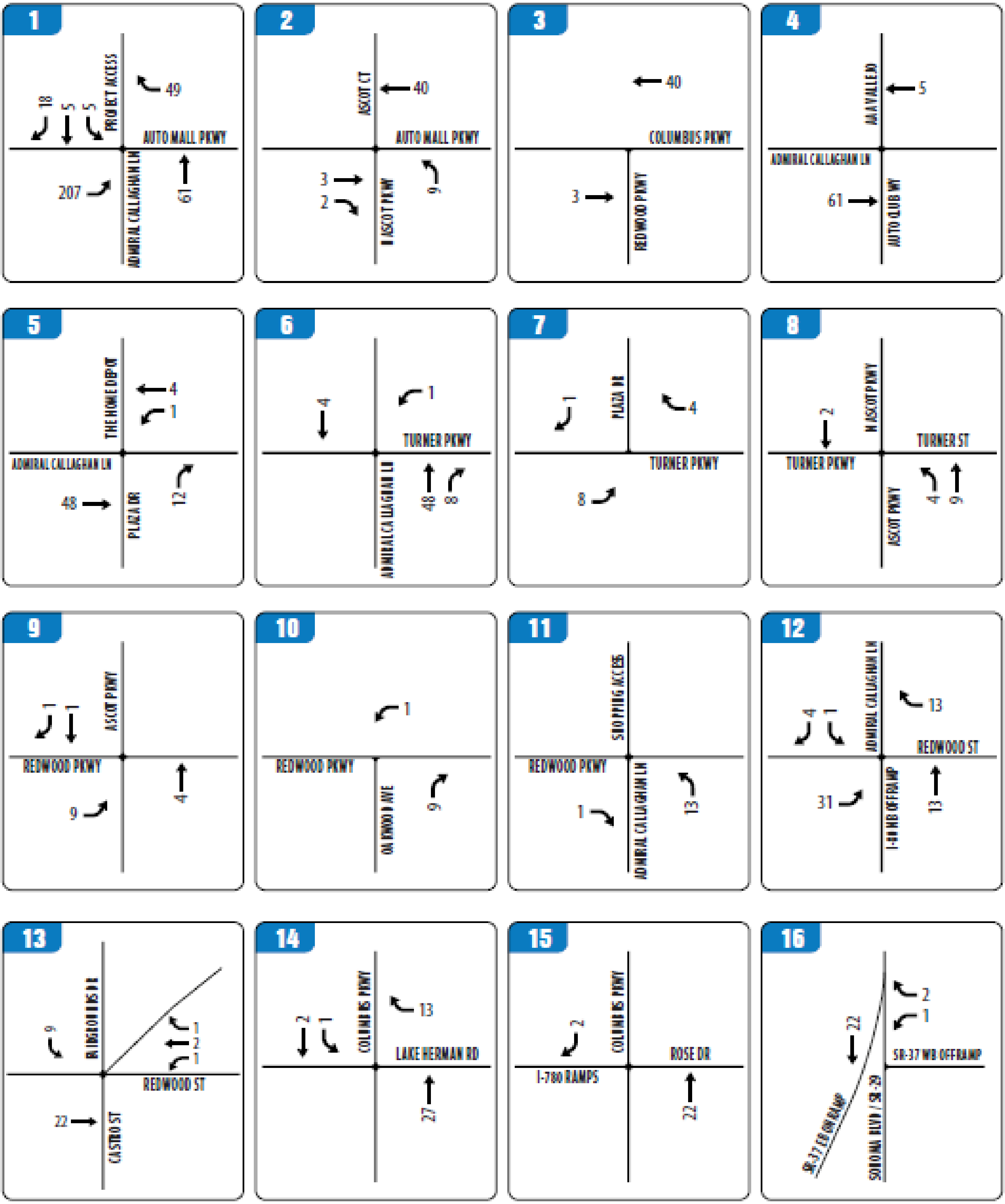

FIGURE A3 | FRIDAY PM EVENT PEAK HOUR TRIPS

TRANSPORTATION IMPACT ANALYSIS

Scotts Valley Casino

City of Vallejo

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Scotts Valley Development – City of Vallejo

TABLE A1
EXISTING PEAK HOUR QUEUING ANALYSIS

ID	Intersection	Turn Lane	Available Storage (ft)	Period	95th % Queue (ft)		
					No Project	With Project	Delta
1	Auto Mall Parkway / Columbus Parkway & Admiral Callaghan Lane	EBL	230 ft	AM	21	193	172
				PM	41	383	342
		WBL	215 ft	AM	88	102	14
				PM	169	188	19
		NBL	425 ft	AM	114	136	22
				PM	405	480	75
		SBL	100 ft	AM	0	48	48
				PM	7	85	78
5	Admiral Callaghan Lane & Plaza Drive	EBL	250 ft	AM	42	44	2
				PM	103	104	1
		WBL	250 ft	AM	122	132	10
				PM	418	463	45
		NBL	200 ft	AM	30	32	2
				PM	117	118	1
		SBL	100 ft	AM	49	52	3
				PM	134	135	1
13	Redwood Street & Fairgrounds Drive / I-80 Southbound Ramps	EBL	160 ft	AM	141	141	0
				PM	122	122	0
		WBL	285 ft	AM	151	168	17
				PM	245	250	5
		SBL	125 ft	AM	129	150	21
				PM	180	193	13
		SWBL	150 ft	AM	138	139	1
				PM	186	186	0

Scotts Valley Development – City of Vallejo

TABLE A2 BASELINE PEAK HOUR QUEUING ANALYSIS							
ID	Intersection	Turn Lane	Available Storage (ft)	Period	95th % Queue (ft)		
					No Project	With Project	Delta
1	Auto Mall Parkway / Columbus Parkway & Admiral Callaghan Lane	EBL	230 ft	AM	22	197	175
				PM	44	394	350
		WBL	215 ft	AM	93	108	15
				PM	178	193	15
		NBL	425 ft	AM	122	142	20
				PM	409	510	101
		SBL	100 ft	AM	0	49	49
				PM	7	85	78
5	Admiral Callaghan Lane & Plaza Drive	EBL	250 ft	AM	43	45	2
				PM	101	104	3
		WBL	250 ft	AM	122	133	11
				PM	403	466	63
		NBL	200 ft	AM	31	32	1
				PM	116	119	3
		SBL	100 ft	AM	50	52	2
				PM	132	136	4
13	Redwood Street & Fairgrounds Drive / I-80 Southbound Ramps	EBL	160 ft	AM	119	159	40
				PM	125	134	9
		WBL	285 ft	AM	170	174	4
				PM	256	263	7
		SBL	125 ft	AM	145	154	9
				PM	187	201	14
		SWBL	150 ft	AM	143	156	13
				PM	192	194	2

Scotts Valley Development – City of Vallejo

TABLE A3
CUMULATIVE PEAK HOUR QUEUING ANALYSIS

ID	Intersection	Turn Lane	Available Storage (ft)	Period	95th % Queue (ft)		
					No Project	With Project	Delta
1	Auto Mall Parkway / Columbus Parkway & Admiral Callaghan Lane	EBL	230 ft	AM	28	211	183
				PM	49	436	387
		WBL	215 ft	AM	120	130	10
				PM	242	259	17
		NBL	425 ft	AM	160	175	15
				PM	548	650	102
		SBL	100 ft	AM	0	52	52
				PM	7	86	79
5	Admiral Callaghan Lane & Plaza Drive	EBL	250 ft	AM	43	45	2
				PM	103	105	2
		WBL	250 ft	AM	125	135	10
				PM	447	483	36
		NBL	200 ft	AM	31	33	2
				PM	118	120	2
		SBL	100 ft	AM	50	53	3
				PM	134	136	2
13	Redwood Street & Fairgrounds Drive / I-80 Southbound Ramps	EBL	160 ft	AM	161	168	7
				PM	166	168	2
		WBL	285 ft	AM	195	199	4
				PM	327	340	13
		SBL	125 ft	AM	169	178	9
				PM	235	259	24
		SWBL	150 ft	AM	170	170	0
				PM	250	250	0

Scotts Valley Development
City of Vallejo

Columbus Parkway/ Auto Mall
2023-2018

CASE ID	COLLISION DATE	COLLISION TIME	PRIMARY RD	SECONDARY RD	DISTANCE	DIRECTION	INTERSECTION	WEATHER 1	TYPE OF COLLISION	COLLISION SEVERITY	NUMBER KILLED	NUMBER INJURED	PCF VIOLATION CATEGORY	MOTOR VEHICLE INVOLVED WITH	ALCOHOL INVOLVED
2023															
82284545	20231013	1209	ADMIRAL CALLAGHAI	AUTO MALL PKWY	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	2	Traffic Signals and Signs	Other Motor Vehicle	0
2022															
81809553	20220601	1550	COLUMBUS PKWY	ADMIRAL CALLAGHA	40	E	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
2021															
81673205	20211201	1840	ADMIRAL CALLAGHAI	AUTO MALL PKWY	15	E	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
81506271	20210522	2040	COLUMBUS PKWY	ADM CALLAGHAN	562	W	N	Clear	Broadside	Injury (Complaint of Pain)	0	1	Improper Turning	Other Motor Vehicle	0
91485226	20210512	2227	ADMIRAL CALLAGHAI	COLUMBUS PKWY	502	W	N	Clear	Hit Object	Property Damage Only	0	0	Other Improper Driving	Fixed Object	0
2020															
9098640	20200425	1448	ADMIRAL CALLAGHAI	AUTO MALL PKWY	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9098570	20200315	1106	ADMIRAL CALLAGHAI	AUTO MALL PKWY	12	S	N	Raining	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
2019															
8894076	20190522	1644	COLUMBUS PKWY	ADMIRAL CALLAGHA	15	W	N	Clear	Hit Object	Injury (Complaint of Pain)	0	1	Improper Turning	Fixed Object	0
2018															
8861898	20181023	1942	COLUMBUS PKWY	ADMIRAL CALLAGHA	555	W	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
9002889	20180905	1746	COLUMBUS PKWY	ADMIRAL CALLAGHA	426	E	N	Clear	Overturned	Injury (Other Visible)	0	1	Other than Driver (or Pedestrian)	Non-Collision	0
90657125	20180205	1635	I-80 E/B TO COLUMB	ADMIRAL CALLAGHA	1000	W	N	Clear	Hit Object	Injury (Complaint of Pain)	0	1	Unsafe Speed	Fixed Object	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBR
Lane Group Flow (vph)	11	709	560	93	788	314	76	2
v/c Ratio	0.05	0.56	0.36	0.30	0.29	0.41	0.09	0.00
Control Delay	29.7	17.4	0.6	26.9	8.4	22.8	0.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	17.4	0.6	26.9	8.4	22.8	0.2	0.0
Queue Length 50th (ft)	3	88	0	25	33	41	0	0
Queue Length 95th (ft)	21	212	0	88	129	114	0	0
Internal Link Dist (ft)		1084			414		644	
Turn Bay Length (ft)	230			215		425		
Base Capacity (vph)	1021	2813	1568	575	3349	1477	1106	971
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.25	0.36	0.16	0.24	0.21	0.07	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	652	515	86	725	0	289	0	70	0	0	2
Future Volume (veh/h)	10	652	515	86	725	0	289	0	70	0	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	709	0	93	788	0	314	0	0	0	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	25	1187		139	2033	0	521	486		4	5	4
Arrive On Green	0.01	0.34	0.00	0.08	0.40	0.00	0.15	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1767	3526	1572	1767	5233	0	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	11	709	0	93	788	0	314	0	0	0	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	0	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	0.3	7.0	0.0	2.1	4.6	0.0	3.6	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.3	7.0	0.0	2.1	4.6	0.0	3.6	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	25	1187		139	2033	0	521	486		4	5	4
V/C Ratio(X)	0.43	0.60		0.67	0.39	0.00	0.60	0.00		0.00	0.00	0.46
Avail Cap(c_a), veh/h	1160	3577		654	3689	0	1678	1130		781	1041	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	20.5	11.5	0.0	18.8	8.9	0.0	16.6	0.0	0.0	0.0	0.0	20.9
Incr Delay (d2), s/veh	11.3	0.5	0.0	5.4	0.1	0.0	1.1	0.0	0.0	0.0	0.0	61.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.0	0.0	0.9	1.2	0.0	1.3	0.0	0.0	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	12.0	0.0	24.1	9.0	0.0	17.7	0.0	0.0	0.0	0.0	82.7
LnGrp LOS	C	B		C	A	A	B	A		A	A	F
Approach Vol, veh/h		720			881			314			2	
Approach Delay, s/veh		12.3			10.6			17.7			82.7	
Approach LOS		B			B			B			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	15.5	7.8	18.6	10.9	4.6	5.1	21.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	25.5	15.5	42.5	20.5	23.5	27.5	30.5
Max Q Clear Time (g_c+I1), s	0.0	0.0	4.1	9.0	5.6	2.1	2.3	6.6
Green Ext Time (p_c), s	0.0	0.0	0.1	5.1	1.0	0.0	0.0	5.4

Intersection Summary	
HCM 6th Ctrl Delay	12.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	23	464	282	18	602	254	8	2	4
v/c Ratio	0.07	0.34	0.36	0.06	0.44	0.28	0.01	0.01	0.01
Control Delay	19.5	10.1	3.5	19.8	10.9	14.7	0.0	21.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	10.1	3.5	19.8	10.9	14.7	0.0	21.5	0.0
Queue Length 50th (ft)	3	23	0	3	32	16	0	0	0
Queue Length 95th (ft)	28	112	46	24	147	77	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	230		275	200		225		75	
Base Capacity (vph)	563	3302	1493	510	3291	2541	1471	402	1088
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.14	0.19	0.04	0.18	0.10	0.01	0.00	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	427	259	17	553	1	234	0	7	2	0	4
Future Volume (veh/h)	21	427	259	17	553	1	234	0	7	2	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	23	464	0	18	601	1	254	0	8	2	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	51	1084		41	1090	2	469	283	240	5	0	29
Arrive On Green	0.03	0.31	0.00	0.02	0.30	0.30	0.14	0.00	0.15	0.00	0.00	0.02
Sat Flow, veh/h	1767	3526	1572	1767	3611	6	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	23	464	0	18	293	309	254	0	8	2	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1854	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	0.4	3.7	0.0	0.4	4.9	4.9	2.4	0.0	0.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.4	3.7	0.0	0.4	4.9	4.9	2.4	0.0	0.2	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	51	1084		41	532	560	469	283	240	5	0	29
V/C Ratio(X)	0.45	0.43		0.44	0.55	0.55	0.54	0.00	0.03	0.40	0.00	0.14
Avail Cap(c_a), veh/h	530	4785		480	2342	2464	2400	1988	1685	379	0	921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	9.7	0.0	16.9	10.2	10.2	14.1	0.0	12.6	17.4	0.0	16.9
Incr Delay (d2), s/veh	6.3	0.3	0.0	7.4	0.9	0.8	1.0	0.0	0.1	43.5	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.9	0.0	0.2	1.3	1.4	0.8	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.0	9.9	0.0	24.3	11.1	11.1	15.0	0.0	12.7	61.0	0.0	19.1
LnGrp LOS	C	A		C	B	B	B	A	B	E	A	B
Approach Vol, veh/h		487			620			262			6	
Approach Delay, s/veh		10.5			11.5			15.0			33.1	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	9.8	5.3	15.3	9.3	5.1	5.5	15.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	37.5	9.5	47.5	24.5	20.5	10.5	46.5
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.4	5.7	4.4	2.1	2.4	6.9
Green Ext Time (p_c), s	0.0	0.0	0.0	3.2	0.8	0.0	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	355	85	11	355	247	53
v/c Ratio	0.32	0.15	0.03	0.27	0.25	0.11
Control Delay	9.0	3.9	12.5	6.3	9.7	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	3.9	12.5	6.3	9.7	4.9
Queue Length 50th (ft)	14	0	1	14	10	0
Queue Length 95th (ft)	61	21	12	33	47	19
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1368	3505	3345	1543
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.05	0.01	0.10	0.07	0.03

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	327	78	10	327	227	49
Future Volume (veh/h)	327	78	10	327	227	49
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	355	85	11	355	247	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	841	375	280	1929	524	240
Arrive On Green	0.24	0.24	0.16	0.55	0.15	0.15
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	355	85	11	355	247	53
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	2.6	1.3	0.2	1.5	2.0	0.9
Cycle Q Clear(g_c), s	2.6	1.3	0.2	1.5	2.0	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	841	375	280	1929	524	240
V/C Ratio(X)	0.42	0.23	0.04	0.18	0.47	0.22
Avail Cap(c_a), veh/h	5462	2436	1207	8398	4512	2069
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.7	9.2	10.7	3.4	11.6	11.1
Incr Delay (d2), s/veh	0.3	0.3	0.1	0.0	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.3	0.0	0.1	0.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.0	9.5	10.7	3.5	12.3	11.6
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	440			366	300	
Approach Delay, s/veh	9.9			3.7	12.1	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.1	9.3	11.7				20.9
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		39.5	20.5	46.5				71.5
Max Q Clear Time (g_c+I1), s		4.0	2.2	4.6				3.5
Green Ext Time (p_c), s		1.0	0.0	2.6				2.4

Intersection Summary	
HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	285	68	487	16	2	25	71	26
v/c Ratio	0.05	0.15	0.12	0.20	0.01	0.00	0.05	0.11	0.05
Control Delay	16.1	10.3	14.4	6.2	0.6	13.5	8.3	13.5	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	10.3	14.4	6.2	0.6	13.5	8.3	13.5	7.6
Queue Length 50th (ft)	4	25	12	22	0	0	1	12	0
Queue Length 95th (ft)	21	54	42	84	2	4	14	41	14
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	1099	3476	1330	3505	1568	1699	1476	1699	1456
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.05	0.14	0.01	0.00	0.02	0.04	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	258	5	63	448	15	2	3	20	65	1	23
Future Volume (veh/h)	22	258	5	63	448	15	2	3	20	65	1	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	280	5	68	487	16	2	3	22	71	1	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1016	18	132	1167	520	416	22	161	417	7	174
Arrive On Green	0.03	0.29	0.29	0.07	0.33	0.33	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3544	63	1767	3526	1572	1374	192	1410	1375	61	1521
Grp Volume(v), veh/h	24	139	146	68	487	16	2	0	25	71	0	26
Grp Sat Flow(s),veh/h/ln	1767	1763	1844	1767	1763	1572	1374	0	1602	1375	0	1582
Q Serve(g_s), s	0.3	1.6	1.6	1.0	2.8	0.2	0.0	0.0	0.4	1.3	0.0	0.4
Cycle Q Clear(g_c), s	0.3	1.6	1.6	1.0	2.8	0.2	0.4	0.0	0.4	1.6	0.0	0.4
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	54	506	529	132	1167	520	416	0	183	417	0	181
V/C Ratio(X)	0.44	0.28	0.28	0.51	0.42	0.03	0.00	0.00	0.14	0.17	0.00	0.14
Avail Cap(c_a), veh/h	1064	3183	3330	1681	7598	3389	2153	0	2208	2156	0	2180
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.3	7.1	7.1	11.5	6.7	5.8	10.5	0.0	10.3	11.0	0.0	10.3
Incr Delay (d2), s/veh	5.6	0.3	0.3	3.1	0.2	0.0	0.0	0.0	0.3	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.4	0.4	0.6	0.0	0.0	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	7.4	7.4	14.5	6.9	5.8	10.5	0.0	10.6	11.2	0.0	10.6
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		309			571			27			97	
Approach Delay, s/veh		8.2			7.8			10.6			11.0	
Approach LOS		A			A			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.4	6.4	11.9		7.4	5.3	13.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		35.5	24.5	46.5		35.5	15.5	55.5				
Max Q Clear Time (g_c+I1), s		2.4	3.0	3.6		3.6	2.3	4.8				
Green Ext Time (p_c), s		0.1	0.1	1.8		0.3	0.0	3.8				
Intersection Summary												
HCM 6th Ctrl Delay			8.3									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	183	207	311	28	23	109	58	14	20
v/c Ratio	0.16	0.27	0.44	0.17	0.10	0.08	0.31	0.19	0.04	0.05
Control Delay	23.4	18.9	20.7	9.7	23.9	24.0	6.6	23.1	21.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	18.9	20.7	9.7	23.9	24.0	6.6	23.1	21.0	0.2
Queue Length 50th (ft)	13	22	55	18	8	6	0	16	3	0
Queue Length 95th (ft)	42	54	122	63	30	27	29	49	19	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	548	1838	1295	2841	855	1126	1010	942	1186	1056
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.16	0.11	0.03	0.02	0.11	0.06	0.01	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	133	35	190	188	98	26	21	100	53	13	18
Future Volume (veh/h)	42	133	35	190	188	98	26	21	100	53	13	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	145	38	207	204	107	28	23	109	58	14	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	89	364	93	282	544	274	209	265	225	167	221	187
Arrive On Green	0.05	0.13	0.13	0.16	0.24	0.24	0.12	0.14	0.14	0.09	0.12	0.12
Sat Flow, veh/h	1767	2783	708	1767	2270	1143	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	46	90	93	207	157	154	28	23	109	58	14	20
Grp Sat Flow(s),veh/h/ln	1767	1763	1728	1767	1763	1650	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	1.0	1.8	1.9	4.2	2.8	3.0	0.5	0.4	2.4	1.2	0.3	0.4
Cycle Q Clear(g_c), s	1.0	1.8	1.9	4.2	2.8	3.0	0.5	0.4	2.4	1.2	0.3	0.4
Prop In Lane	1.00		0.41	1.00		0.69	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	89	231	226	282	422	395	209	265	225	167	221	187
V/C Ratio(X)	0.51	0.39	0.41	0.73	0.37	0.39	0.13	0.09	0.49	0.35	0.06	0.11
Avail Cap(c_a), veh/h	580	995	975	1554	1967	1841	905	1242	1053	997	1340	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	15.2	15.2	15.2	12.1	12.1	15.0	14.2	15.0	16.1	14.9	15.0
Incr Delay (d2), s/veh	4.5	1.1	1.2	3.7	0.5	0.6	0.3	0.1	1.6	1.2	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.7	0.7	1.7	1.0	0.9	0.2	0.2	0.8	0.5	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	16.2	16.4	19.0	12.6	12.8	15.3	14.3	16.7	17.4	15.0	15.2
LnGrp LOS	C	B	B	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		229			518			160			92	
Approach Delay, s/veh		17.5			15.2			16.1			16.6	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	9.9	10.6	9.5	9.0	9.0	6.4	13.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	21.5	25.5	33.5	21.5	19.5	27.5	12.5	42.5				
Max Q Clear Time (g_c+I1), s	3.2	4.4	6.2	3.9	2.5	2.4	3.0	5.0				
Green Ext Time (p_c), s	0.1	0.4	0.6	0.9	0.0	0.1	0.0	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			16.0									
HCM 6th LOS			B									

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	141	14	432	45	209
v/c Ratio	0.14	0.03	0.27	0.09	0.10
Control Delay	12.3	8.5	7.7	13.6	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	8.5	7.7	13.6	4.4
Queue Length 50th (ft)	6	0	13	4	8
Queue Length 95th (ft)	32	10	61	29	18
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2979	1250	3330	1325	3505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.13	0.03	0.06

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	128	15	266	132	41	192
Future Volume (veh/h)	128	15	266	132	41	192
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	139	16	289	143	45	209
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	459	204	677	326	94	1838
Arrive On Green	0.13	0.13	0.29	0.29	0.05	0.52
Sat Flow, veh/h	3534	1572	2399	1112	1767	3618
Grp Volume(v), veh/h	139	16	219	213	45	209
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1655	1767	1763
Q Serve(g_s), s	0.9	0.2	2.6	2.7	0.6	0.8
Cycle Q Clear(g_c), s	0.9	0.2	2.6	2.7	0.6	0.8
Prop In Lane	1.00	1.00		0.67	1.00	
Lane Grp Cap(c), veh/h	459	204	518	486	94	1838
V/C Ratio(X)	0.30	0.08	0.42	0.44	0.48	0.11
Avail Cap(c_a), veh/h	3902	1736	3859	3623	1472	11268
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	9.9	7.4	7.4	11.9	3.1
Incr Delay (d2), s/veh	0.4	0.2	0.6	0.6	3.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.6	0.6	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.5	10.0	7.9	8.0	15.6	3.2
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	155		432			254
Approach Delay, s/veh	10.5		8.0			5.4
Approach LOS	B		A			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	5.9	12.1	18.0	7.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	56.5	82.5	28.5
Max Q Clear Time (g_c+I1), s	2.6	4.7	2.8	2.9
Green Ext Time (p_c), s	0.1	3.0	1.5	0.5

Intersection Summary	
HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	137	46	240	107	49
v/c Ratio	0.29	0.03	0.30	0.15	0.14
Control Delay	13.4	3.6	6.4	11.6	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	3.6	6.4	11.6	6.6
Queue Length 50th (ft)	21	1	6	7	0
Queue Length 95th (ft)	56	5	27	22	19
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1752	3505	2980	3104	1326
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	0.08	0.03	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	126	42	71	150	81	63
Future Volume (veh/h)	126	42	71	150	81	63
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	137	46	77	163	103	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	217	1783	355	317	467	208
Arrive On Green	0.12	0.51	0.20	0.20	0.13	0.13
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	137	46	77	163	103	52
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	1.8	0.2	0.9	2.3	0.6	0.7
Cycle Q Clear(g_c), s	1.8	0.2	0.9	2.3	0.6	0.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	217	1783	355	317	467	208
V/C Ratio(X)	0.63	0.03	0.22	0.51	0.22	0.25
Avail Cap(c_a), veh/h	2880	11135	2376	2120	4622	2056
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.4	3.1	8.3	8.8	9.6	9.7
Incr Delay (d2), s/veh	3.0	0.0	0.3	1.3	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.2	0.6	0.2	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.4	3.1	8.6	10.1	9.9	10.3
LnGrp LOS	B	A	A	B	A	B
Approach Vol, veh/h		183	240		155	
Approach Delay, s/veh		10.8	9.6		10.0	
Approach LOS		B	A		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				17.1		7.8	7.6	9.5
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				78.5		32.5	40.5	33.5
Max Q Clear Time (g_c+I1), s				2.2		2.7	3.8	4.3
Green Ext Time (p_c), s				0.3		0.5	0.4	1.5

Intersection Summary			
HCM 6th Ctrl Delay			10.1
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	7	112	3	27	190	219	9	294
v/c Ratio	0.09	0.02	0.30	0.01	0.10	0.39	0.10	0.03	0.34
Control Delay	20.9	20.2	6.4	22.0	14.0	17.5	6.7	21.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	20.2	6.4	22.0	14.0	17.5	6.7	21.5	15.7
Queue Length 50th (ft)	5	1	0	1	1	34	7	2	26
Queue Length 95th (ft)	28	12	30	8	23	113	50	15	80
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	542	1231	1091	354	958	1490	3466	401	2793
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.10	0.01	0.03	0.13	0.06	0.02	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	6	103	3	6	18	175	198	4	8	231	40
Future Volume (veh/h)	23	6	103	3	6	18	175	198	4	8	231	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	7	112	3	7	20	190	215	4	9	251	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	55	256	217	7	47	135	261	1125	21	21	549	93
Arrive On Green	0.03	0.14	0.14	0.00	0.11	0.11	0.15	0.32	0.32	0.01	0.18	0.18
Sat Flow, veh/h	1767	1856	1572	1767	424	1213	1767	3541	66	1767	3017	510
Grp Volume(v), veh/h	25	7	112	3	0	27	190	107	112	9	145	149
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1637	1767	1763	1844	1767	1763	1764
Q Serve(g_s), s	0.5	0.1	2.3	0.1	0.0	0.5	3.5	1.5	1.5	0.2	2.5	2.6
Cycle Q Clear(g_c), s	0.5	0.1	2.3	0.1	0.0	0.5	3.5	1.5	1.5	0.2	2.5	2.6
Prop In Lane	1.00		1.00	1.00		0.74	1.00		0.04	1.00		0.29
Lane Grp Cap(c), veh/h	55	256	217	7	0	182	261	560	586	21	321	321
V/C Ratio(X)	0.46	0.03	0.52	0.41	0.00	0.15	0.73	0.19	0.19	0.43	0.45	0.46
Avail Cap(c_a), veh/h	597	1389	1177	389	0	1033	1842	3131	3274	441	1733	1735
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	12.7	13.6	16.9	0.0	13.7	13.9	8.4	8.4	16.7	12.4	12.4
Incr Delay (d2), s/veh	5.9	0.0	1.9	33.5	0.0	0.4	3.9	0.2	0.2	12.9	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.7	0.1	0.0	0.2	1.3	0.4	0.4	0.1	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	12.8	15.5	50.4	0.0	14.1	17.7	8.6	8.6	29.6	13.4	13.5
LnGrp LOS	C	B	B	D	A	B	B	A	A	C	B	B
Approach Vol, veh/h		144			30			409			303	
Approach Delay, s/veh		16.5			17.7			12.8			13.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.9	15.3	4.6	9.2	9.5	10.7	5.6	8.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.5	60.5	7.5	25.5	35.5	33.5	11.5	21.5
Max Q Clear Time (g_c+I1), s	2.2	3.5	2.1	4.3	5.5	4.6	2.5	2.5
Green Ext Time (p_c), s	0.0	1.3	0.0	0.3	0.5	1.7	0.0	0.1

Intersection Summary			
HCM 6th Ctrl Delay			14.0
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	127	694	115	260	405	284	159	262
v/c Ratio	0.53	0.75	0.52	0.32	0.78	0.32	0.59	0.55
Control Delay	48.3	30.9	50.1	29.9	41.7	27.2	48.2	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	30.9	50.1	29.9	41.7	27.2	48.2	30.0
Queue Length 50th (ft)	68	148	62	59	209	64	85	46
Queue Length 95th (ft)	149	267	142	120	372	115	179	102
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	367	1207	300	1050	799	1622	400	876
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.57	0.38	0.25	0.51	0.18	0.40	0.30

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	360	279	106	204	35	373	223	39	146	148	93
Future Volume (veh/h)	117	360	279	106	204	35	373	223	39	146	148	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	127	391	0	115	222	0	405	242	0	159	161	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	168	661		151	628		490	904		210	345	
Arrive On Green	0.09	0.19	0.00	0.09	0.18	0.00	0.28	0.26	0.00	0.12	0.10	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	127	391	0	115	222	0	405	242	0	159	161	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	3.6	5.2	0.0	3.3	2.8	0.0	11.0	2.8	0.0	4.5	2.2	0.0
Cycle Q Clear(g_c), s	3.6	5.2	0.0	3.3	2.8	0.0	11.0	2.8	0.0	4.5	2.2	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	168	661		151	628		490	904		210	345	
V/C Ratio(X)	0.76	0.59		0.76	0.35		0.83	0.27		0.76	0.47	
Avail Cap(c_a), veh/h	612	1964		501	1744		1330	2736		667	1413	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.6	19.0	0.0	22.9	18.4	0.0	17.3	15.2	0.0	21.8	21.8	0.0
Incr Delay (d2), s/veh	6.8	0.8	0.0	7.7	0.3	0.0	3.6	0.2	0.0	5.5	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.9	0.0	1.5	1.0	0.0	4.2	1.0	0.0	2.0	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	19.8	0.0	30.6	18.8	0.0	20.9	15.3	0.0	27.4	22.8	0.0
LnGrp LOS	C	B		C	B		C	B		C	C	
Approach Vol, veh/h		518			337			647			320	
Approach Delay, s/veh		22.2			22.8			18.8			25.1	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	17.6	8.9	14.1	18.7	9.5	9.4	13.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	19.3	39.7	14.5	28.5	38.5	20.5	17.7	25.3				
Max Q Clear Time (g_c+I1), s	6.5	4.8	5.3	7.2	13.0	4.2	5.6	4.8				
Green Ext Time (p_c), s	0.3	1.6	0.2	2.4	1.2	0.8	0.2	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			21.6									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	589	352	373	271	428
v/c Ratio	0.65	0.69	0.17	0.62	0.60
Control Delay	26.5	32.8	6.6	33.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	32.8	6.6	33.6	7.0
Queue Length 50th (ft)	103	133	31	104	0
Queue Length 95th (ft)	223	306	70	245	77
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1480	1015	3192	963	1055
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.35	0.12	0.28	0.41

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	358	184	324	343	249	394
Future Volume (veh/h)	358	184	324	343	249	394
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	389	200	352	373	271	428
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	544	276	417	1918	566	503
Arrive On Green	0.24	0.24	0.24	0.54	0.32	0.32
Sat Flow, veh/h	2356	1148	1767	3618	1767	1572
Grp Volume(v), veh/h	302	287	352	373	271	428
Grp Sat Flow(s),veh/h/ln	1763	1649	1767	1763	1767	1572
Q Serve(g_s), s	10.4	10.6	12.6	3.6	8.2	16.8
Cycle Q Clear(g_c), s	10.4	10.6	12.6	3.6	8.2	16.8
Prop In Lane		0.70	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	423	396	417	1918	566	503
V/C Ratio(X)	0.71	0.73	0.84	0.19	0.48	0.85
Avail Cap(c_a), veh/h	786	735	1054	3914	1001	891
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	23.1	24.1	7.7	18.1	21.0
Incr Delay (d2), s/veh	2.2	2.5	4.8	0.0	0.6	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	4.1	5.4	1.1	3.2	6.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.3	25.7	28.9	7.7	18.7	25.2
LnGrp LOS	C	C	C	A	B	C
Approach Vol, veh/h	589			725	699	
Approach Delay, s/veh	25.5			18.0	22.7	
Approach LOS	C			B	C	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		25.7	20.1	20.4				40.5
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		37.5	39.5	29.5				73.5
Max Q Clear Time (g_c+I1), s		18.8	14.6	12.6				5.6
Green Ext Time (p_c), s		2.4	1.1	3.3				2.6

Intersection Summary	
HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	20	632	77	585	110	78
v/c Ratio	0.06	0.37	0.18	0.27	0.28	0.11
Control Delay	22.3	12.0	20.2	7.2	19.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	12.0	20.2	7.2	19.3	0.3
Queue Length 50th (ft)	5	67	18	32	25	0
Queue Length 95th (ft)	23	133	57	112	73	0
Internal Link Dist (ft)		424		851		1161
Turn Bay Length (ft)	125		125		75	
Base Capacity (vph)	678	3267	999	3475	1143	1358
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.19	0.08	0.17	0.10	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	501	80	71	537	1	101	0	72	0	0	0
Future Volume (veh/h)	18	501	80	71	537	1	101	0	72	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	545	87	77	584	1	110	0	78	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	45	1058	168	139	1446	2	467	0	206	236	243	0
Arrive On Green	0.03	0.35	0.35	0.08	0.40	0.40	0.13	0.00	0.13	0.00	0.00	0.00
Sat Flow, veh/h	1767	3046	485	1767	3611	6	1767	0	1572	1311	1856	0
Grp Volume(v), veh/h	20	315	317	77	285	300	110	0	78	0	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1768	1767	1763	1854	1767	0	1572	1311	1856	0
Q Serve(g_s), s	0.3	4.3	4.3	1.3	3.5	3.5	1.8	0.0	1.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	4.3	4.3	1.3	3.5	3.5	1.8	0.0	1.4	0.0	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	45	612	614	139	706	743	467	0	206	236	243	0
V/C Ratio(X)	0.44	0.51	0.52	0.55	0.40	0.40	0.24	0.00	0.38	0.00	0.00	0.00
Avail Cap(c_a), veh/h	667	2865	2874	1190	3386	3562	2355	0	1885	1636	2224	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	14.6	7.9	7.9	13.5	6.5	6.5	12.3	0.0	12.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.7	0.7	0.7	3.4	0.4	0.4	0.3	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.0	1.0	0.5	0.7	0.8	0.6	0.0	0.4	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	8.6	8.6	16.9	6.9	6.9	12.5	0.0	13.3	0.0	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	B	A	A	A
Approach Vol, veh/h		652			662			188			0	
Approach Delay, s/veh		9.0			8.1			12.8			0.0	
Approach LOS		A			A			B				
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		8.5	6.9	15.1		8.5	5.3	16.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		36.5	20.5	49.5		36.5	11.5	58.5				
Max Q Clear Time (g_c+I1), s		3.8	3.3	6.3		0.0	2.3	5.5				
Green Ext Time (p_c), s		0.8	0.1	4.2		0.0	0.0	3.8				
Intersection Summary												
HCM 6th Ctrl Delay			9.0									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	343	382	693	258	207	72	867
v/c Ratio	0.56	0.21	0.69	0.47	0.49	0.17	0.78
Control Delay	35.1	10.5	28.3	35.3	10.0	34.5	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	10.5	28.3	35.3	10.0	34.5	8.5
Queue Length 50th (ft)	73	42	134	56	0	15	0
Queue Length 95th (ft)	159	97	274	126	64	42	57
Internal Link Dist (ft)		852	424	1178			
Turn Bay Length (ft)	275				450	100	300
Base Capacity (vph)	937	2709	1517	927	567	1361	1625
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.14	0.46	0.28	0.37	0.05	0.53

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	316	351	0	0	472	166	0	237	190	66	0	798
Future Volume (veh/h)	316	351	0	0	472	166	0	237	190	66	0	798
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	0	1856	1856	1856	0	1856
Adj Flow Rate, veh/h	343	382	0	0	513	180	0	258	207	72	0	867
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	3	3	0	3
Cap, veh/h	502	1813	0	0	740	258	0	665	297	205	0	0
Arrive On Green	0.15	0.51	0.00	0.00	0.29	0.29	0.00	0.19	0.19	0.06	0.00	0.00
Sat Flow, veh/h	3428	3618	0	0	2655	895	0	3618	1572	3428	72	
Grp Volume(v), veh/h	343	382	0	0	352	341	0	258	207	72	26.7	
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1763	1694	0	1763	1572	1714	C	
Q Serve(g_s), s	5.4	3.4	0.0	0.0	10.1	10.2	0.0	3.6	7.0	1.1		
Cycle Q Clear(g_c), s	5.4	3.4	0.0	0.0	10.1	10.2	0.0	3.6	7.0	1.1		
Prop In Lane	1.00		0.00	0.00		0.53	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	502	1813	0	0	509	489	0	665	297	205		
V/C Ratio(X)	0.68	0.21	0.00	0.00	0.69	0.70	0.00	0.39	0.70	0.35		
Avail Cap(c_a), veh/h	1223	3564	0	0	1013	974	0	1209	539	1778		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	23.0	7.5	0.0	0.0	18.0	18.0	0.0	20.2	21.6	25.7		
Incr Delay (d2), s/veh	1.6	0.1	0.0	0.0	1.7	1.8	0.0	0.4	3.0	1.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.1	1.0	0.0	0.0	3.8	3.7	0.0	1.4	2.6	0.5		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	7.6	0.0	0.0	19.7	19.8	0.0	20.6	24.5	26.7		
LnGrp LOS	C	A	A	A	B	B	A	C	C	C		
Approach Vol, veh/h		725			693			465				
Approach Delay, s/veh		15.7			19.8			22.3				
Approach LOS		B			B			C				
Timer - Assigned Phs	1	2		4			7	8				
Phs Duration (G+Y+Rc), s	7.9	15.2		33.8			12.8	20.9				
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s	29.5	19.5		57.5			20.3	32.7				
Max Q Clear Time (g_c+I1), s	3.1	9.0		5.4			7.4	12.2				
Green Ext Time (p_c), s	0.2	1.7		2.7			1.0	4.2				
Intersection Summary												
HCM 6th Ctrl Delay			19.1									
HCM 6th LOS			B									

Lane Group	EBL	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL	SWR
Lane Group Flow (vph)	76	513	364	308	1067	113	138	148	122	317
v/c Ratio	0.64	0.46	0.48	0.61	0.77	0.47	0.54	0.43	0.38	0.80
Control Delay	71.1	26.4	5.1	43.0	27.6	45.0	46.8	11.0	39.6	37.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.1	26.4	5.1	43.0	27.6	45.0	46.8	11.0	39.6	37.7
Queue Length 50th (ft)	43	122	0	85	272	60	74	0	60	97
Queue Length 95th (ft)	#141	192	62	151	382	129	152	56	138	#286
Internal Link Dist (ft)		693			852		265		1072	
Turn Bay Length (ft)	150		200	285		125		125		
Base Capacity (vph)	118	1950	1033	693	2368	363	382	442	363	432
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.26	0.35	0.44	0.45	0.31	0.36	0.33	0.34	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	70	472	335	283	825	156	104	127	136	112	0	264
Future Volume (vph)	70	472	335	283	825	156	104	127	136	112	0	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	1568	3400	3421		1752	1845	1568		1752	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	1568	3400	3421		1752	1845	1568		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	513	364	308	897	170	113	138	148	122	0	287
RTOR Reduction (vph)	0	0	246	0	0	0	0	0	127	0	0	111
Lane Group Flow (vph)	76	513	118	308	1067	0	113	138	21	0	122	206
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Prot	Prot	Prot	Prot
Protected Phases	5	2		1	6		4	4	4	8	8	8
Permitted Phases			2									
Actuated Green, G (s)	6.1	28.8	28.8	13.4	36.1		12.4	12.4	12.4		16.4	16.4
Effective Green, g (s)	6.1	28.8	28.8	13.4	36.1		12.4	12.4	12.4		16.4	16.4
Actuated g/C Ratio	0.07	0.32	0.32	0.15	0.41		0.14	0.14	0.14		0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	120	1134	507	511	1387		244	257	218		322	288
v/s Ratio Prot	0.04	0.15		c0.09	c0.31		0.06	c0.07	0.01		0.07	c0.13
v/s Ratio Perm			0.08									
v/c Ratio	0.63	0.45	0.23	0.60	0.77		0.46	0.54	0.09		0.38	0.72
Uniform Delay, d1	40.4	23.9	22.0	35.3	22.9		35.2	35.6	33.4		31.8	34.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	10.4	0.3	0.2	2.0	2.6		1.4	2.2	0.2		0.7	8.2
Delay (s)	50.8	24.1	22.3	37.3	25.5		36.6	37.8	33.6		32.6	42.3
Level of Service	D	C	C	D	C		D	D	C		C	D
Approach Delay (s)		25.5			28.1			35.9			39.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	28
Future Volume (vph)	28
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	30
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	33	65	323	79	172	214
v/c Ratio	0.08	0.16	0.28	0.14	0.30	0.09
Control Delay	16.3	7.0	12.4	5.0	14.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	7.0	12.4	5.0	14.0	2.8
Queue Length 50th (ft)	6	0	30	0	31	7
Queue Length 95th (ft)	26	24	64	23	78	16
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1384	1252	3315	1487	1690	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.05	0.10	0.05	0.10	0.06

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	60	297	73	158	197
Future Volume (veh/h)	30	60	297	73	158	197
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	33	65	323	79	172	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	170	151	825	368	307	2020
Arrive On Green	0.10	0.10	0.23	0.23	0.17	0.57
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	33	65	323	79	172	214
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	0.5	1.1	2.1	1.1	2.4	0.8
Cycle Q Clear(g_c), s	0.5	1.1	2.1	1.1	2.4	0.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	170	151	825	368	307	2020
V/C Ratio(X)	0.19	0.43	0.39	0.21	0.56	0.11
Avail Cap(c_a), veh/h	1786	1589	4989	2225	2630	10819
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	11.6	8.8	8.4	10.3	2.6
Incr Delay (d2), s/veh	0.6	1.9	0.3	0.3	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.5	0.2	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.9	13.5	9.1	8.7	11.9	2.7
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	98		402			386
Approach Delay, s/veh	13.0		9.0			6.8
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.2	10.9				20.1		7.1
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	40.5	38.5				83.5		27.5
Max Q Clear Time (g_c+I1), s	4.4	4.1				2.8		3.1
Green Ext Time (p_c), s	0.5	2.3				1.4		0.2

Intersection Summary		
HCM 6th Ctrl Delay		8.5
HCM 6th LOS		A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	57	86	138	137	92	36	286	84	114	484
v/c Ratio	0.15	0.21	0.30	0.23	0.16	0.10	0.23	0.21	0.13	0.49
Control Delay	25.6	23.5	24.2	21.4	2.7	26.4	19.9	25.1	17.5	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	23.5	24.2	21.4	2.7	26.4	19.9	25.1	17.5	4.5
Queue Length 50th (ft)	17	23	40	39	0	11	41	25	22	0
Queue Length 95th (ft)	55	70	102	98	17	40	87	72	79	69
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	628	871	869	1144	1024	478	2791	724	1664	1462
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.10	0.16	0.12	0.09	0.08	0.10	0.12	0.07	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	65	14	127	126	85	33	225	38	77	105	445
Future Volume (veh/h)	52	65	14	127	126	85	33	225	38	77	105	445
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	71	15	138	137	92	36	245	41	84	114	484
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	98	155	33	184	283	240	70	1043	172	124	696	589
Arrive On Green	0.06	0.10	0.10	0.10	0.15	0.15	0.04	0.34	0.34	0.07	0.37	0.37
Sat Flow, veh/h	1767	1485	314	1767	1856	1572	1767	3029	500	1767	1856	1572
Grp Volume(v), veh/h	57	0	86	138	137	92	36	141	145	84	114	484
Grp Sat Flow(s),veh/h/ln	1767	0	1799	1767	1856	1572	1767	1763	1766	1767	1856	1572
Q Serve(g_s), s	1.5	0.0	2.1	3.6	3.2	2.5	1.0	2.7	2.8	2.2	2.0	13.3
Cycle Q Clear(g_c), s	1.5	0.0	2.1	3.6	3.2	2.5	1.0	2.7	2.8	2.2	2.0	13.3
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	98	0	187	184	283	240	70	607	608	124	696	589
V/C Ratio(X)	0.58	0.00	0.46	0.75	0.48	0.38	0.51	0.23	0.24	0.68	0.16	0.82
Avail Cap(c_a), veh/h	426	0	773	796	1186	1005	315	1644	1647	574	2003	1697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	0.0	20.1	20.8	18.5	18.2	22.5	11.2	11.2	21.6	9.9	13.5
Incr Delay (d2), s/veh	5.3	0.0	1.8	6.0	1.3	1.0	5.7	0.2	0.2	6.2	0.1	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.9	1.7	1.3	0.9	0.5	0.9	0.9	1.0	0.7	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	0.0	21.9	26.8	19.8	19.2	28.1	11.3	11.4	27.9	10.0	16.4
LnGrp LOS	C	A	C	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		143			367			322			682	
Approach Delay, s/veh		24.0			22.3			13.2			16.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	20.9	9.5	9.5	6.4	22.4	7.2	11.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	44.5	21.5	20.5	8.5	51.5	11.5	30.5
Max Q Clear Time (g_c+I1), s	4.2	4.8	5.6	4.1	3.0	15.3	3.5	5.2
Green Ext Time (p_c), s	0.1	1.8	0.3	0.3	0.0	2.6	0.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	18.0
HCM 6th LOS	B

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	420	889	561	36	1493	207
v/c Ratio	0.44	0.75	0.27	0.04	0.73	0.13
Control Delay	24.7	13.3	8.4	3.0	14.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	13.3	8.4	3.0	14.2	0.2
Queue Length 50th (ft)	75	61	56	0	218	0
Queue Length 95th (ft)	166	192	125	13	452	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	2346	2082	3329	1491	3329	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.43	0.17	0.02	0.45	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	386	0	818	0	516	33	0	1374	190
Future Volume (veh/h)	0	0	0	386	0	818	0	516	33	0	1374	190
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				420	0	889	0	561	36	0	1493	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1276	0	1030	0	1880	839	0	1880	
Arrive On Green				0.37	0.00	0.37	0.00	0.53	0.53	0.00	0.53	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				420	0	889	0	561	36	0	1493	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				8.3	0.0	28.3	0.0	8.4	1.0	0.0	32.7	0.0
Cycle Q Clear(g_c), s				8.3	0.0	28.3	0.0	8.4	1.0	0.0	32.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1276	0	1030	0	1880	839	0	1880	
V/C Ratio(X)				0.33	0.00	0.86	0.00	0.30	0.04	0.00	0.79	
Avail Cap(c_a), veh/h				1673	0	1351	0	3127	1395	0	3127	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				21.4	0.0	27.7	0.0	12.3	10.6	0.0	18.0	0.0
Incr Delay (d2), s/veh				0.1	0.0	4.7	0.0	0.1	0.0	0.0	0.8	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.2	0.0	9.4	0.0	3.0	0.3	0.0	11.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				21.5	0.0	32.4	0.0	12.4	10.6	0.0	18.8	0.0
LnGrp LOS				C	A	C	A	B	B	A	B	
Approach Vol, veh/h					1309			597			1493	
Approach Delay, s/veh					28.9			12.3			18.8	
Approach LOS					C			B			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		55.3				55.3		40.0				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		84.5				84.5		46.5				
Max Q Clear Time (g_c+I1), s		10.4				34.7		30.3				
Green Ext Time (p_c), s		4.1				16.2		5.2				

Intersection Summary			
HCM 6th Ctrl Delay			21.6
HCM 6th LOS			C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	23	657	992	141	708	1021	180	1	2
v/c Ratio	0.16	0.69	0.63	0.56	0.34	0.76	0.18	0.01	0.01
Control Delay	43.8	32.7	2.0	46.2	19.2	27.0	0.4	45.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	32.7	2.0	46.2	19.2	27.0	0.4	45.0	0.0
Queue Length 50th (ft)	12	164	0	69	79	223	0	1	0
Queue Length 95th (ft)	41	268	0	#169	172	405	0	7	0
Internal Link Dist (ft)		1084			414		644		
Turn Bay Length (ft)	230			215		425		100	
Base Capacity (vph)	537	1342	1568	293	2111	1637	1088	394	612
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.49	0.63	0.48	0.34	0.62	0.17	0.00	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	604	913	130	650	1	939	0	166	1	0	2
Future Volume (veh/h)	21	604	913	130	650	1	939	0	166	1	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	23	657	0	141	707	1	1021	0	0	1	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	46	913		181	1751	2	1243	540		134	8	6
Arrive On Green	0.03	0.26	0.00	0.10	0.34	0.34	0.36	0.00	0.00	0.08	0.00	0.00
Sat Flow, veh/h	1767	3526	1572	1767	5224	7	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	23	657	0	141	457	251	1021	0	0	1	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1854	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	0.8	11.2	0.0	5.1	6.9	6.9	17.9	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.8	11.2	0.0	5.1	6.9	6.9	17.9	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	46	913		181	1132	622	1243	540		134	8	6
V/C Ratio(X)	0.50	0.72		0.78	0.40	0.40	0.82	0.00		0.01	0.00	0.31
Avail Cap(c_a), veh/h	655	1631		358	1132	622	1995	1122		481	547	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.8	22.3	0.0	29.0	16.9	16.9	19.1	0.0	0.0	28.3	0.0	32.8
Incr Delay (d2), s/veh	8.1	1.1	0.0	7.1	0.2	0.4	1.5	0.0	0.0	0.0	0.0	25.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.3	0.0	2.4	2.4	2.6	6.7	0.0	0.0	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	23.4	0.0	36.1	17.1	17.3	20.7	0.0	0.0	28.3	0.0	58.6
LnGrp LOS	D	C		D	B	B	C	A		C	A	E
Approach Vol, veh/h		680			849			1021			3	
Approach Delay, s/veh		24.0			20.3			20.7			48.5	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	23.7	11.3	21.6	28.5	4.8	6.2	26.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	40.0	13.4	30.6	38.5	19.5	24.5	19.5
Max Q Clear Time (g_c+I1), s	2.0	0.0	7.1	13.2	19.9	2.1	2.8	8.9
Green Ext Time (p_c), s	0.0	0.0	0.2	3.9	4.1	0.0	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	57	636	233	32	650	158	27	2	4
v/c Ratio	0.15	0.32	0.24	0.09	0.37	0.19	0.04	0.01	0.01
Control Delay	21.3	9.9	3.1	22.4	12.2	19.4	0.1	24.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	9.9	3.1	22.4	12.2	19.4	0.1	24.5	0.0
Queue Length 50th (ft)	12	31	0	7	65	17	0	1	0
Queue Length 95th (ft)	52	149	40	35	160	55	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	857	3363	1514	609	3312	1790	1276	435	1015
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.19	0.15	0.05	0.20	0.09	0.02	0.00	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	585	214	29	598	0	145	0	25	2	0	4
Future Volume (veh/h)	52	585	214	29	598	0	145	0	25	2	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	636	0	32	650	0	158	0	27	2	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	105	1229		67	1152	0	364	263	223	5	0	61
Arrive On Green	0.06	0.35	0.00	0.04	0.33	0.00	0.11	0.00	0.14	0.00	0.00	0.04
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	57	636	0	32	650	0	158	0	27	2	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.2	5.5	0.0	0.7	5.8	0.0	1.7	0.0	0.6	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.2	5.5	0.0	0.7	5.8	0.0	1.7	0.0	0.6	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	1229		67	1152	0	364	263	223	5	0	61
V/C Ratio(X)	0.54	0.52		0.48	0.56	0.00	0.43	0.00	0.12	0.41	0.00	0.07
Avail Cap(c_a), veh/h	714	5007		484	4548	0	1563	1426	1209	345	0	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.5	9.9	0.0	18.1	10.7	0.0	16.1	0.0	14.4	19.1	0.0	17.8
Incr Delay (d2), s/veh	4.3	0.3	0.0	5.3	0.4	0.0	0.8	0.0	0.2	47.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.5	0.0	0.3	1.6	0.0	0.6	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	10.3	0.0	23.4	11.1	0.0	16.9	0.0	14.6	66.6	0.0	18.2
LnGrp LOS	C	B		C	B	A	B	A	B	E	A	B
Approach Vol, veh/h		693			682			185			6	
Approach Delay, s/veh		11.2			11.7			16.6			34.4	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	9.9	5.9	17.9	8.6	6.0	6.8	17.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	29.5	10.5	54.5	17.5	19.5	15.5	49.5
Max Q Clear Time (g_c+I1), s	2.0	2.6	2.7	7.5	3.7	2.1	3.2	7.8
Green Ext Time (p_c), s	0.0	0.0	0.0	4.6	0.4	0.0	0.1	4.7

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	416	220	40	513	125	22
v/c Ratio	0.19	0.20	0.07	0.21	0.11	0.04
Control Delay	6.4	2.5	12.5	4.0	10.9	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	2.5	12.5	4.0	10.9	7.3
Queue Length 50th (ft)	17	0	4	22	6	0
Queue Length 95th (ft)	68	32	28	41	31	14
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1532	3505	3161	1459
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.14	0.03	0.15	0.04	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	383	202	37	472	115	20
Future Volume (veh/h)	383	202	37	472	115	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	416	220	40	513	125	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1036	462	281	2103	395	181
Arrive On Green	0.29	0.29	0.16	0.60	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	416	220	40	513	125	22
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	3.0	3.6	0.6	2.1	1.0	0.4
Cycle Q Clear(g_c), s	3.0	3.6	0.6	2.1	1.0	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1036	462	281	2103	395	181
V/C Ratio(X)	0.40	0.48	0.14	0.24	0.32	0.12
Avail Cap(c_a), veh/h	5812	2593	1443	9198	3238	1485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.8	9.1	11.3	3.0	12.7	12.4
Incr Delay (d2), s/veh	0.3	0.8	0.2	0.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.8	0.2	0.1	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	9.8	11.5	3.0	13.1	12.7
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	636			553	147	
Approach Delay, s/veh	9.3			3.7	13.1	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.1	9.5	13.7				23.1
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		29.5	25.5	51.5				81.5
Max Q Clear Time (g_c+I1), s		3.0	2.6	5.6				4.1
Green Ext Time (p_c), s		0.4	0.1	3.6				3.6

Intersection Summary	
HCM 6th Ctrl Delay	7.4
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	890	203	813	40	17	185	133	91
v/c Ratio	0.35	0.68	0.57	0.46	0.05	0.06	0.38	0.58	0.22
Control Delay	41.6	23.6	37.3	14.9	2.7	28.0	8.6	40.5	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	23.6	37.3	14.9	2.7	28.0	8.6	40.5	11.3
Queue Length 50th (ft)	30	165	80	125	0	6	4	52	5
Queue Length 95th (ft)	99	337	206	243	12	28	62	146	49
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	318	2398	648	2878	1297	626	861	499	824
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.37	0.31	0.28	0.03	0.03	0.21	0.27	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	782	37	187	748	37	16	12	158	122	15	69
Future Volume (veh/h)	69	782	37	187	748	37	16	12	158	122	15	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	850	40	203	813	40	17	13	172	133	16	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	107	1240	58	262	1583	706	398	28	377	312	72	340
Arrive On Green	0.06	0.36	0.36	0.15	0.45	0.45	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1767	3428	161	1767	3526	1572	1295	112	1478	1189	284	1332
Grp Volume(v), veh/h	75	437	453	203	813	40	17	0	185	133	0	91
Grp Sat Flow(s),veh/h/ln	1767	1763	1827	1767	1763	1572	1295	0	1590	1189	0	1616
Q Serve(g_s), s	2.4	12.1	12.1	6.3	9.5	0.8	0.6	0.0	5.6	6.1	0.0	2.6
Cycle Q Clear(g_c), s	2.4	12.1	12.1	6.3	9.5	0.8	3.2	0.0	5.6	11.7	0.0	2.6
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.93	1.00		0.82
Lane Grp Cap(c), veh/h	107	637	660	262	1583	706	398	0	406	312	0	412
V/C Ratio(X)	0.70	0.69	0.69	0.78	0.51	0.06	0.04	0.00	0.46	0.43	0.00	0.22
Avail Cap(c_a), veh/h	385	1458	1511	785	3715	1657	824	0	928	703	0	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.4	15.6	15.6	23.5	11.3	8.9	18.1	0.0	18.0	23.0	0.0	16.9
Incr Delay (d2), s/veh	7.9	1.3	1.3	4.9	0.3	0.0	0.0	0.0	0.8	0.9	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.5	4.6	2.8	3.2	0.2	0.2	0.0	2.0	1.7	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.4	16.9	16.8	28.4	11.6	9.0	18.2	0.0	18.8	23.9	0.0	17.1
LnGrp LOS	C	B	B	C	B	A	B	A	B	C	A	B
Approach Vol, veh/h		965			1056			202			224	
Approach Delay, s/veh		18.2			14.7			18.8			21.2	
Approach LOS		B			B			B			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.1	13.0	25.3		19.1	8.0	30.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		33.5	25.5	47.5		33.5	12.5	60.5				
Max Q Clear Time (g_c+I1), s		7.6	8.3	14.1		13.7	4.4	11.5				
Green Ext Time (p_c), s		1.2	0.5	6.7		0.9	0.1	7.2				
Intersection Summary												
HCM 6th Ctrl Delay			17.0									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	509	422	484	92	48	430	109	58	60
v/c Ratio	0.38	0.65	0.75	0.29	0.41	0.21	0.75	0.45	0.24	0.18
Control Delay	48.6	36.1	38.0	14.8	45.9	40.2	13.3	45.6	39.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	36.1	38.0	14.8	45.9	40.2	13.3	45.6	39.6	1.2
Queue Length 50th (ft)	36	124	198	71	46	24	0	54	28	0
Queue Length 95th (ft)	103	247	#418	150	117	66	95	134	74	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	246	1084	850	2179	419	586	791	419	586	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.47	0.50	0.22	0.22	0.08	0.54	0.26	0.10	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	395	74	388	311	134	85	44	396	100	53	55
Future Volume (veh/h)	67	395	74	388	311	134	85	44	396	100	53	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	73	429	80	422	338	146	92	48	430	109	58	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	94	547	101	469	956	405	132	493	418	149	511	433
Arrive On Green	0.05	0.18	0.18	0.27	0.40	0.40	0.07	0.27	0.27	0.08	0.28	0.28
Sat Flow, veh/h	1767	2970	550	1767	2412	1023	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	73	253	256	422	245	239	92	48	430	109	58	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1757	1767	1763	1671	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.7	12.3	12.5	20.7	8.8	9.0	4.6	1.8	23.9	5.4	2.1	2.6
Cycle Q Clear(g_c), s	3.7	12.3	12.5	20.7	8.8	9.0	4.6	1.8	23.9	5.4	2.1	2.6
Prop In Lane	1.00		0.31	1.00		0.61	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	325	324	469	699	663	132	493	418	149	511	433
V/C Ratio(X)	0.77	0.78	0.79	0.90	0.35	0.36	0.70	0.10	1.03	0.73	0.11	0.14
Avail Cap(c_a), veh/h	208	463	461	717	970	920	354	493	418	354	511	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	34.9	35.0	31.9	19.0	19.1	40.6	24.9	33.0	40.2	24.4	24.5
Incr Delay (d2), s/veh	12.6	5.4	5.9	10.0	0.3	0.3	6.5	0.1	51.7	6.7	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.7	5.8	9.9	3.5	3.5	2.2	0.8	14.8	2.6	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.6	40.4	40.9	41.8	19.3	19.4	47.1	25.0	84.7	46.9	24.5	24.7
LnGrp LOS	D	D	D	D	B	B	D	C	F	D	C	C
Approach Vol, veh/h		582			906			570			227	
Approach Delay, s/veh		42.4			29.8			73.6			35.3	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	28.4	28.4	21.1	11.2	29.3	9.3	40.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	23.9	36.5	23.6	18.0	23.9	10.6	49.5
Max Q Clear Time (g_c+I1), s	7.4	25.9	22.7	14.5	6.6	4.6	5.7	11.0
Green Ext Time (p_c), s	0.2	0.0	1.2	2.1	0.1	0.4	0.1	3.3

Intersection Summary	
HCM 6th Ctrl Delay	44.5
HCM 6th LOS	D

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	493	26	863	76	491
v/c Ratio	0.56	0.07	0.62	0.28	0.25
Control Delay	23.6	9.7	15.1	30.2	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	9.7	15.1	30.2	6.4
Queue Length 50th (ft)	78	0	106	25	36
Queue Length 95th (ft)	159	19	207	76	75
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2116	896	3008	518	3459
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.03	0.29	0.15	0.14

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	451	27	503	291	70	452
Future Volume (veh/h)	451	27	503	291	70	452
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	490	29	547	316	76	491
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	761	339	878	506	122	2042
Arrive On Green	0.22	0.22	0.41	0.41	0.07	0.58
Sat Flow, veh/h	3534	1572	2245	1242	1767	3618
Grp Volume(v), veh/h	490	29	448	415	76	491
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1632	1767	1763
Q Serve(g_s), s	5.5	0.6	8.8	8.9	1.8	3.0
Cycle Q Clear(g_c), s	5.5	0.6	8.8	8.9	1.8	3.0
Prop In Lane	1.00	1.00		0.76	1.00	
Lane Grp Cap(c), veh/h	761	339	719	665	122	2042
V/C Ratio(X)	0.64	0.09	0.62	0.62	0.62	0.24
Avail Cap(c_a), veh/h	2702	1202	2313	2141	625	6235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	13.7	10.3	10.3	19.9	4.5
Incr Delay (d2), s/veh	0.9	0.1	0.9	1.0	5.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.2	2.8	2.6	0.8	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.6	13.9	11.2	11.3	25.0	4.6
LnGrp LOS	B	B	B	B	C	A
Approach Vol, veh/h	519		863			567
Approach Delay, s/veh	16.4		11.2			7.3
Approach LOS	B		B			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	7.5	22.4	29.9	13.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	57.5	77.5	33.5
Max Q Clear Time (g_c+I1), s	3.8	10.9	5.0	7.5
Green Ext Time (p_c), s	0.1	7.0	3.8	1.9

Intersection Summary	
HCM 6th Ctrl Delay	11.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	216	105	425	415	188
v/c Ratio	0.48	0.06	0.52	0.48	0.37
Control Delay	19.7	5.3	8.9	16.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	5.3	8.9	16.8	5.8
Queue Length 50th (ft)	46	5	15	42	0
Queue Length 95th (ft)	120	16	56	97	43
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1510	3505	2184	2776	1214
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.19	0.15	0.15

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	199	97	122	269	315	240
Future Volume (veh/h)	199	97	122	269	315	240
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	216	105	133	292	398	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	292	1965	494	440	774	344
Arrive On Green	0.17	0.56	0.28	0.28	0.22	0.22
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	216	105	133	292	398	201
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	4.7	0.5	2.4	6.6	4.0	4.6
Cycle Q Clear(g_c), s	4.7	0.5	2.4	6.6	4.0	4.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	292	1965	494	440	774	344
V/C Ratio(X)	0.74	0.05	0.27	0.66	0.51	0.58
Avail Cap(c_a), veh/h	1735	6441	1293	1153	3294	1466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	4.1	11.3	12.8	13.8	14.1
Incr Delay (d2), s/veh	3.6	0.0	0.3	1.7	0.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.1	0.8	2.1	1.4	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.6	4.1	11.6	14.5	14.4	15.6
LnGrp LOS	B	A	B	B	B	B
Approach Vol, veh/h		321	425		599	
Approach Delay, s/veh		14.5	13.6		14.8	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				26.9		13.3	11.2	15.8
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				73.5		37.5	39.5	29.5
Max Q Clear Time (g_c+I1), s				2.5		6.6	6.7	8.6
Green Ext Time (p_c), s				0.7		2.2	0.6	2.7

Intersection Summary			
HCM 6th Ctrl Delay			14.4
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	11	354	5	19	329	124	22	239
v/c Ratio	0.21	0.04	0.63	0.02	0.08	0.58	0.06	0.09	0.36
Control Delay	24.2	21.5	9.0	27.6	19.9	19.9	7.5	26.2	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	21.5	9.0	27.6	19.9	19.9	7.5	26.2	15.7
Queue Length 50th (ft)	13	2	0	1	2	64	4	5	17
Queue Length 95th (ft)	61	17	67	13	23	209	34	31	67
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	449	1296	1207	214	978	1511	3313	293	1775
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.01	0.29	0.02	0.02	0.22	0.04	0.08	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	10	326	5	9	8	303	111	3	20	140	80
Future Volume (veh/h)	57	10	326	5	9	8	303	111	3	20	140	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	62	11	354	5	10	9	329	121	3	22	152	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	102	509	431	12	201	181	411	1184	29	46	288	156
Arrive On Green	0.06	0.27	0.27	0.01	0.22	0.22	0.23	0.34	0.34	0.03	0.13	0.13
Sat Flow, veh/h	1767	1856	1572	1767	900	810	1767	3516	87	1767	2207	1196
Grp Volume(v), veh/h	62	11	354	5	0	19	329	60	64	22	120	119
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1710	1767	1763	1840	1767	1763	1640
Q Serve(g_s), s	1.7	0.2	10.7	0.1	0.0	0.4	8.9	1.2	1.2	0.6	3.2	3.4
Cycle Q Clear(g_c), s	1.7	0.2	10.7	0.1	0.0	0.4	8.9	1.2	1.2	0.6	3.2	3.4
Prop In Lane	1.00		1.00	1.00		0.47	1.00		0.05	1.00		0.73
Lane Grp Cap(c), veh/h	102	509	431	12	0	382	411	594	620	46	230	214
V/C Ratio(X)	0.61	0.02	0.82	0.42	0.00	0.05	0.80	0.10	0.10	0.47	0.52	0.56
Avail Cap(c_a), veh/h	402	1156	979	192	0	862	1450	2004	2092	262	819	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	13.4	17.2	25.0	0.0	15.4	18.3	11.5	11.5	24.3	20.5	20.6
Incr Delay (d2), s/veh	5.8	0.0	3.9	22.1	0.0	0.1	3.7	0.1	0.1	7.3	1.8	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.1	3.8	0.1	0.0	0.2	3.5	0.4	0.4	0.3	1.3	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.1	13.4	21.1	47.1	0.0	15.5	22.0	11.6	11.6	31.6	22.3	22.9
LnGrp LOS	C	B	C	D	A	B	C	B	B	C	C	C
Approach Vol, veh/h		427			24			453			261	
Approach Delay, s/veh		22.1			22.1			19.1			23.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	21.5	4.8	18.4	16.3	11.1	7.4	15.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	57.5	5.5	31.5	41.5	23.5	11.5	25.5
Max Q Clear Time (g_c+I1), s	2.6	3.2	2.1	12.7	10.9	5.4	3.7	2.4
Green Ext Time (p_c), s	0.0	0.7	0.0	1.2	1.0	1.2	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay		21.2
HCM 6th LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	325	39	156	125	338	33	407
v/c Ratio	0.30	0.31	0.15	0.26	0.35	0.27	0.13	0.48
Control Delay	25.9	11.6	26.8	21.0	25.5	14.2	27.0	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	11.6	26.8	21.0	25.5	14.2	27.0	15.9
Queue Length 50th (ft)	29	18	12	18	37	30	10	41
Queue Length 95th (ft)	81	69	42	52	96	88	38	93
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	891	2158	458	1668	915	2913	419	2265
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.15	0.09	0.09	0.14	0.12	0.08	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	157	142	36	108	36	115	258	53	30	224	151
Future Volume (veh/h)	91	157	142	36	108	36	115	258	53	30	224	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	99	171	0	39	117	0	125	280	0	33	243	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	156	633		80	481		177	787		69	572	
Arrive On Green	0.09	0.18	0.00	0.05	0.14	0.00	0.10	0.22	0.00	0.04	0.16	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	99	171	0	39	117	0	125	280	0	33	243	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	1.9	1.5	0.0	0.8	1.0	0.0	2.4	2.4	0.0	0.6	2.2	0.0
Cycle Q Clear(g_c), s	1.9	1.5	0.0	0.8	1.0	0.0	2.4	2.4	0.0	0.6	2.2	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	156	633		80	481		177	787		69	572	
V/C Ratio(X)	0.64	0.27		0.49	0.24		0.70	0.36		0.48	0.42	
Avail Cap(c_a), veh/h	1133	3264		579	2159		1183	4770		529	3465	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.5	12.4	0.0	16.4	13.5	0.0	15.3	11.5	0.0	16.5	13.2	0.0
Incr Delay (d2), s/veh	4.2	0.2	0.0	4.6	0.3	0.0	5.0	0.3	0.0	5.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.5	0.0	0.3	0.3	0.0	1.0	0.7	0.0	0.3	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	12.6	0.0	21.0	13.8	0.0	20.3	11.8	0.0	21.5	13.7	0.0
LnGrp LOS	B	B		C	B		C	B		C	B	
Approach Vol, veh/h		270			156			405			276	
Approach Delay, s/veh		15.2			15.6			14.4			14.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	12.3	6.1	10.8	8.0	10.2	7.6	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	47.5	11.5	32.5	23.5	34.5	22.5	21.5
Max Q Clear Time (g_c+I1), s	2.6	4.4	2.8	3.5	4.4	4.2	3.9	3.0
Green Ext Time (p_c), s	0.0	1.9	0.0	1.0	0.3	1.5	0.2	0.5

Intersection Summary			
HCM 6th Ctrl Delay			14.8
HCM 6th LOS			B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	387	180	221	138	187
v/c Ratio	0.46	0.43	0.11	0.37	0.39
Control Delay	14.9	19.3	4.6	19.7	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	19.3	4.6	19.7	6.3
Queue Length 50th (ft)	35	38	10	29	0
Queue Length 95th (ft)	82	100	25	82	41
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	2497	1449	3505	1479	1353
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.12	0.06	0.09	0.14

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	240	116	166	203	127	172		
Future Volume (veh/h)	240	116	166	203	127	172		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No			No	No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	261	126	180	221	138	187		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	550	258	248	1832	342	305		
Arrive On Green	0.24	0.24	0.14	0.52	0.19	0.19		
Sat Flow, veh/h	2423	1092	1767	3618	1767	1572		
Grp Volume(v), veh/h	196	191	180	221	138	187		
Grp Sat Flow(s),veh/h/ln	1763	1659	1767	1763	1767	1572		
Q Serve(g_s), s	3.0	3.1	3.1	1.0	2.1	3.4		
Cycle Q Clear(g_c), s	3.0	3.1	3.1	1.0	2.1	3.4		
Prop In Lane		0.66	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	416	392	248	1832	342	305		
V/C Ratio(X)	0.47	0.49	0.73	0.12	0.40	0.61		
Avail Cap(c_a), veh/h	1824	1716	2053	8249	2110	1877		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	10.3	10.4	12.9	3.9	11.1	11.6		
Incr Delay (d2), s/veh	0.8	0.9	4.0	0.0	0.8	2.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.9	0.9	1.2	0.1	0.7	1.0		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	11.1	11.3	16.9	3.9	11.8	13.6		
LnGrp LOS	B	B	B	A	B	B		
Approach Vol, veh/h	387			401	325			
Approach Delay, s/veh	11.2			9.8	12.8			
Approach LOS	B			A	B			
Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.6	8.9	11.9				20.8
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		37.5	36.5	32.5				73.5
Max Q Clear Time (g_c+I1), s		5.4	5.1	5.1				3.0
Green Ext Time (p_c), s		1.0	0.5	2.3				1.5
Intersection Summary								
HCM 6th Ctrl Delay			11.2					
HCM 6th LOS			B					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	23	789	58	361	232	98	7
v/c Ratio	0.10	0.59	0.22	0.23	0.54	0.14	0.01
Control Delay	32.1	16.9	30.4	11.9	24.8	0.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	16.9	30.4	11.9	24.8	0.4	0.0
Queue Length 50th (ft)	7	111	19	28	70	0	0
Queue Length 95th (ft)	35	226	64	96	171	0	0
Internal Link Dist (ft)		424		851		1161	269
Turn Bay Length (ft)	125		125		75		
Base Capacity (vph)	306	2755	451	2972	1117	1318	1355
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.29	0.13	0.12	0.21	0.07	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	554	172	53	331	1	213	0	90	0	0	6
Future Volume (veh/h)	21	554	172	53	331	1	213	0	90	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	23	602	187	58	360	1	232	0	98	0	0	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	50	989	307	105	1459	4	500	0	367	178	0	367
Arrive On Green	0.03	0.37	0.37	0.06	0.40	0.40	0.23	0.00	0.23	0.00	0.00	0.23
Sat Flow, veh/h	1767	2649	821	1767	3606	10	1397	0	1572	1287	0	1572
Grp Volume(v), veh/h	23	400	389	58	176	185	232	0	98	0	0	7
Grp Sat Flow(s),veh/h/ln	1767	1763	1708	1767	1763	1854	1397	0	1572	1287	0	1572
Q Serve(g_s), s	0.5	7.4	7.5	1.3	2.7	2.7	6.2	0.0	2.1	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.5	7.4	7.5	1.3	2.7	2.7	6.3	0.0	2.1	0.0	0.0	0.1
Prop In Lane	1.00		0.48	1.00		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	50	658	638	105	713	750	500	0	367	178	0	367
V/C Ratio(X)	0.46	0.61	0.61	0.55	0.25	0.25	0.46	0.00	0.27	0.00	0.00	0.02
Avail Cap(c_a), veh/h	371	2070	2005	546	2244	2360	1780	0	1808	1357	0	1808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	19.4	10.3	10.3	18.5	8.0	8.0	14.4	0.0	12.7	0.0	0.0	11.9
Incr Delay (d2), s/veh	6.5	0.9	0.9	4.5	0.2	0.2	0.7	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.2	2.1	0.6	0.7	0.8	1.7	0.0	0.6	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	11.2	11.2	23.0	8.1	8.1	15.0	0.0	13.1	0.0	0.0	12.0
LnGrp LOS	C	B	B	C	A	A	B	A	B	A	A	B
Approach Vol, veh/h		812			419			330			7	
Approach Delay, s/veh		11.6			10.2			14.5			12.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.0	6.9	19.6		14.0	5.6	20.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		46.5	12.5	47.5		46.5	8.5	51.5				
Max Q Clear Time (g_c+I1), s		8.3	3.3	9.5		2.1	2.5	4.7				
Green Ext Time (p_c), s		1.3	0.1	5.6		0.0	0.0	2.2				

Intersection Summary		
HCM 6th Ctrl Delay		11.8
HCM 6th LOS		B

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	598	452	636	363	125	224	1115
v/c Ratio	0.76	0.25	0.77	0.61	0.34	0.39	0.80
Control Delay	41.7	14.1	35.6	42.4	10.1	38.3	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.7	14.1	35.6	42.4	10.1	38.3	7.5
Queue Length 50th (ft)	170	73	151	105	0	62	0
Queue Length 95th (ft)	287	140	272	186	52	110	58
Internal Link Dist (ft)		852	424	1178			
Turn Bay Length (ft)	275				450	100	300
Base Capacity (vph)	1053	2270	1030	848	474	1053	1624
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.20	0.62	0.43	0.26	0.21	0.69

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	550	416	0	0	352	233	0	334	115	206	0	1026
Future Volume (veh/h)	550	416	0	0	352	233	0	334	115	206	0	1026
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	0	1856	1856	1856	0	1856
Adj Flow Rate, veh/h	598	452	0	0	383	253	0	363	125	224	0	1115
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	3	3	0	3
Cap, veh/h	763	1901	0	0	512	333	0	563	251	348	0	0
Arrive On Green	0.22	0.54	0.00	0.00	0.25	0.25	0.00	0.16	0.16	0.10	0.00	0.00
Sat Flow, veh/h	3428	3618	0	0	2138	1333	0	3618	1572	3428	224	
Grp Volume(v), veh/h	598	452	0	0	329	307	0	363	125	224	31.2	
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1763	1616	0	1763	1572	1714	C	
Q Serve(g_s), s	11.1	4.6	0.0	0.0	11.7	11.9	0.0	6.5	4.9	4.3		
Cycle Q Clear(g_c), s	11.1	4.6	0.0	0.0	11.7	11.9	0.0	6.5	4.9	4.3		
Prop In Lane	1.00		0.00	0.00		0.83	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	763	1901	0	0	441	404	0	563	251	348		
V/C Ratio(X)	0.78	0.24	0.00	0.00	0.75	0.76	0.00	0.64	0.50	0.64		
Avail Cap(c_a), veh/h	1393	2996	0	0	664	609	0	1120	500	1393		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	24.8	8.2	0.0	0.0	23.4	23.5	0.0	26.6	26.0	29.2		
Incr Delay (d2), s/veh	1.8	0.1	0.0	0.0	2.5	3.0	0.0	1.2	1.5	2.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.4	1.5	0.0	0.0	4.8	4.5	0.0	2.7	1.9	1.8		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	8.3	0.0	0.0	25.9	26.5	0.0	27.9	27.5	31.2		
LnGrp LOS	C	A	A	A	C	C	A	C	C	C		
Approach Vol, veh/h		1050			636			488				
Approach Delay, s/veh		18.7			26.2			27.8				
Approach LOS		B			C			C				

Timer - Assigned Phs	1	2		4			7	8
Phs Duration (G+Y+Rc), s	11.4	15.3		41.0			19.6	21.4
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5	4.5
Max Green Setting (Gmax), s	27.5	21.5		57.5			27.5	25.5
Max Q Clear Time (g_c+I1), s	6.3	8.5		6.6			13.1	13.9
Green Ext Time (p_c), s	0.7	2.3		3.3			2.0	3.0

Intersection Summary			
HCM 6th Ctrl Delay			23.7
HCM 6th LOS			C

Lane Group	EBL	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL	SWR
Lane Group Flow (vph)	89	741	552	489	1017	150	149	95	159	242
v/c Ratio	0.49	0.67	0.66	0.73	0.67	0.60	0.57	0.28	0.61	0.69
Control Delay	56.4	32.9	8.7	45.9	26.2	53.8	51.8	4.7	52.7	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	32.9	8.7	45.9	26.2	53.8	51.8	4.7	52.7	30.8
Queue Length 50th (ft)	54	208	25	148	272	90	89	0	95	62
Queue Length 95th (ft)	122	321	140	245	413	180	178	20	186	166
Internal Link Dist (ft)		693			852		265		1072	
Turn Bay Length (ft)	150		200	285		125		125		
Base Capacity (vph)	235	1517	960	867	1883	344	362	417	389	454
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.49	0.57	0.56	0.54	0.44	0.41	0.23	0.41	0.53

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	82	682	508	450	755	180	138	137	87	146	0	202
Future Volume (vph)	82	682	508	450	755	180	138	137	87	146	0	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	1568	3400	3404		1752	1845	1568		1752	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	1568	3400	3404		1752	1845	1568		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	89	741	552	489	821	196	150	149	95	159	0	220
RTOR Reduction (vph)	0	0	333	0	0	0	0	0	82	0	0	116
Lane Group Flow (vph)	89	741	219	489	1017	0	150	149	13	0	159	126
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Prot	Prot	Prot	Prot
Protected Phases	5	2		1	6		4	4	4	8	8	8
Permitted Phases			2									
Actuated Green, G (s)	8.1	32.0	32.0	19.1	43.0		13.7	13.7	13.7		14.4	14.4
Effective Green, g (s)	8.1	32.0	32.0	19.1	43.0		13.7	13.7	13.7		14.4	14.4
Actuated g/C Ratio	0.08	0.33	0.33	0.20	0.44		0.14	0.14	0.14		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	146	1153	516	668	1505		246	260	221		259	232
v/s Ratio Prot	0.05	0.21		c0.14	c0.30		c0.09	0.08	0.01		c0.09	0.08
v/s Ratio Perm			0.14									
v/c Ratio	0.61	0.64	0.42	0.73	0.68		0.61	0.57	0.06		0.61	0.54
Uniform Delay, d1	43.0	27.7	25.4	36.6	21.6		39.2	39.0	36.2		38.8	38.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.0	1.2	0.6	4.1	1.2		4.2	3.0	0.1		4.3	2.6
Delay (s)	50.1	29.0	26.0	40.8	22.8		43.5	42.1	36.3		43.1	40.9
Level of Service	D	C	C	D	C		D	D	D		D	D
Approach Delay (s)		29.1			28.6			41.2			41.8	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	95	264	370	32	49	366
v/c Ratio	0.21	0.44	0.33	0.06	0.12	0.24
Control Delay	13.4	5.4	10.8	5.8	14.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	5.4	10.8	5.8	14.2	5.5
Queue Length 50th (ft)	9	0	16	0	5	15
Queue Length 95th (ft)	49	43	67	14	32	34
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1736	1556	3369	1508	1431	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.17	0.11	0.02	0.03	0.10

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	87	243	340	29	45	337
Future Volume (veh/h)	87	243	340	29	45	337
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	95	264	370	32	49	366
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	421	375	785	350	254	1756
Arrive On Green	0.24	0.24	0.22	0.22	0.14	0.50
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	95	264	370	32	49	366
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	1.5	5.2	3.1	0.6	0.8	2.0
Cycle Q Clear(g_c), s	1.5	5.2	3.1	0.6	0.8	2.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	421	375	785	350	254	1756
V/C Ratio(X)	0.23	0.70	0.47	0.09	0.19	0.21
Avail Cap(c_a), veh/h	2252	2004	3976	1773	1268	6971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.5	11.9	11.5	10.5	12.9	4.8
Incr Delay (d2), s/veh	0.3	2.4	0.4	0.1	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.5	0.9	0.1	0.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.7	14.3	12.0	10.6	13.2	4.9
LnGrp LOS	B	B	B	B	B	A
Approach Vol, veh/h	359		402			415
Approach Delay, s/veh	13.4		11.9			5.8
Approach LOS	B		B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.4	12.1				21.5		12.6
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	24.5	38.5				67.5		43.5
Max Q Clear Time (g_c+I1), s	2.8	5.1				4.0		7.2
Green Ext Time (p_c), s	0.1	2.5				2.5		1.2

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	83	190	103	110	155	73	865	154	112	376
v/c Ratio	0.42	0.60	0.47	0.32	0.37	0.39	0.70	0.56	0.13	0.41
Control Delay	49.6	44.5	49.3	38.4	9.3	49.9	28.3	47.3	19.1	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	44.5	49.3	38.4	9.3	49.9	28.3	47.3	19.1	3.6
Queue Length 50th (ft)	43	94	53	53	0	38	209	79	39	0
Queue Length 95th (ft)	114	207	134	127	56	104	353	181	87	55
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	280	519	322	572	593	255	1982	434	1216	1162
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.37	0.32	0.19	0.26	0.29	0.44	0.35	0.09	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	145	29	95	101	143	67	650	145	142	103	346
Future Volume (veh/h)	76	145	29	95	101	143	67	650	145	142	103	346
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	83	158	32	103	110	155	73	707	158	154	112	376
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	111	223	45	135	300	255	105	1017	227	201	761	645
Arrive On Green	0.06	0.15	0.15	0.08	0.16	0.16	0.06	0.36	0.36	0.11	0.41	0.41
Sat Flow, veh/h	1767	1498	303	1767	1856	1572	1767	2864	640	1767	1856	1572
Grp Volume(v), veh/h	83	0	190	103	110	155	73	435	430	154	112	376
Grp Sat Flow(s),veh/h/ln	1767	0	1801	1767	1856	1572	1767	1763	1740	1767	1856	1572
Q Serve(g_s), s	2.7	0.0	5.9	3.4	3.1	5.4	2.4	12.4	12.4	5.0	2.2	10.9
Cycle Q Clear(g_c), s	2.7	0.0	5.9	3.4	3.1	5.4	2.4	12.4	12.4	5.0	2.2	10.9
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	111	0	268	135	300	255	105	626	618	201	761	645
V/C Ratio(X)	0.74	0.00	0.71	0.76	0.37	0.61	0.70	0.69	0.70	0.77	0.15	0.58
Avail Cap(c_a), veh/h	378	0	689	435	769	652	345	1363	1346	586	1687	1430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	0.0	23.8	26.7	22.0	22.9	27.2	16.2	16.2	25.3	10.9	13.5
Incr Delay (d2), s/veh	9.4	0.0	3.4	8.7	0.7	2.3	8.1	1.4	1.4	6.0	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	2.6	1.7	1.3	2.0	1.2	4.7	4.6	2.3	0.8	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	0.0	27.3	35.3	22.7	25.3	35.3	17.6	17.7	31.3	11.0	14.3
LnGrp LOS	D	A	C	D	C	C	D	B	B	C	B	B
Approach Vol, veh/h		273			368			938			642	
Approach Delay, s/veh		30.1			27.3			19.0			17.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	25.4	9.0	13.3	8.0	28.6	8.2	14.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	19.5	45.5	14.5	22.5	11.5	53.5	12.6	24.4
Max Q Clear Time (g_c+I1), s	7.0	14.4	5.4	7.9	4.4	12.9	4.7	7.4
Green Ext Time (p_c), s	0.3	6.5	0.1	0.8	0.1	2.1	0.1	1.0

Intersection Summary			
HCM 6th Ctrl Delay			21.4
HCM 6th LOS			C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	348	891	960	87	1340	268
v/c Ratio	0.27	0.77	0.53	0.10	0.75	0.17
Control Delay	21.4	25.7	16.8	3.5	21.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	25.7	16.8	3.5	21.2	0.2
Queue Length 50th (ft)	65	192	172	0	283	0
Queue Length 95th (ft)	139	390	336	26	541	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	2307	1929	2903	1313	2903	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.46	0.33	0.07	0.46	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	320	0	820	0	883	80	0	1233	247
Future Volume (veh/h)	0	0	0	320	0	820	0	883	80	0	1233	247
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				348	0	891	0	960	87	0	1340	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1330	0	1073	0	1760	785	0	1760	
Arrive On Green				0.39	0.00	0.39	0.00	0.50	0.50	0.00	0.50	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				348	0	891	0	960	87	0	1340	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				5.5	0.0	23.2	0.0	14.9	2.3	0.0	24.5	0.0
Cycle Q Clear(g_c), s				5.5	0.0	23.2	0.0	14.9	2.3	0.0	24.5	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1330	0	1073	0	1760	785	0	1760	
V/C Ratio(X)				0.26	0.00	0.83	0.00	0.55	0.11	0.00	0.76	
Avail Cap(c_a), veh/h				2431	0	1963	0	3297	1470	0	3297	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.6	0.0	22.0	0.0	13.7	10.6	0.0	16.1	0.0
Incr Delay (d2), s/veh				0.1	0.0	1.7	0.0	0.3	0.1	0.0	0.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.0	0.0	7.0	0.0	5.2	0.7	0.0	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				16.7	0.0	23.7	0.0	14.0	10.6	0.0	16.8	0.0
LnGrp LOS				B	A	C	A	B	B	A	B	
Approach Vol, veh/h					1239			1047			1340	
Approach Delay, s/veh					21.8			13.7			16.8	
Approach LOS					C			B			B	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		44.3				44.3		35.4				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		74.5				74.5		56.5				
Max Q Clear Time (g_c+I1), s		16.9				26.5		25.2				
Green Ext Time (p_c), s		8.4				13.3		5.7				

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	215	709	560	93	838	314	136	32	37	130
v/c Ratio	0.56	0.49	0.36	0.37	0.58	0.49	0.38	0.17	0.18	0.25
Control Delay	34.1	19.6	0.6	37.2	24.4	31.9	24.5	38.8	38.5	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	19.6	0.6	37.2	24.4	31.9	24.5	38.8	38.5	12.9
Queue Length 50th (ft)	88	135	0	39	119	67	35	14	16	22
Queue Length 95th (ft)	193	234	0	102	204	136	105	48	53	71
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	789	2396	1568	429	2410	1101	684	512	656	874
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.30	0.36	0.22	0.35	0.29	0.20	0.06	0.06	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	652	515	86	725	46	289	55	70	29	34	120
Future Volume (veh/h)	198	652	515	86	725	46	289	55	70	29	34	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	215	709	0	93	788	50	314	60	0	32	37	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	277	1264		121	1317	83	477	294		159	203	418
Arrive On Green	0.16	0.36	0.00	0.07	0.27	0.27	0.14	0.16	0.00	0.09	0.11	0.11
Sat Flow, veh/h	1767	3526	1572	1767	4869	308	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	215	709	0	93	546	292	314	60	0	32	37	130
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1800	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	6.5	9.0	0.0	2.9	7.8	7.8	4.8	1.6	0.0	0.9	1.0	3.7
Cycle Q Clear(g_c), s	6.5	9.0	0.0	2.9	7.8	7.8	4.8	1.6	0.0	0.9	1.0	3.7
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	277	1264		121	913	487	477	294		159	203	418
V/C Ratio(X)	0.78	0.56		0.77	0.60	0.60	0.66	0.20		0.20	0.18	0.31
Avail Cap(c_a), veh/h	908	2764		494	1857	990	1267	819		589	753	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	14.3	0.0	25.4	17.6	17.6	22.6	20.3	0.0	23.4	22.5	16.3
Incr Delay (d2), s/veh	4.6	0.4	0.0	9.6	0.6	1.2	1.6	0.3	0.0	0.6	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.0	0.0	1.4	2.6	2.9	1.9	0.7	0.0	0.4	0.4	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	14.7	0.0	35.0	18.2	18.8	24.2	20.7	0.0	24.0	22.9	16.7
LnGrp LOS	C	B		D	B	B	C	C		C	C	B
Approach Vol, veh/h		924			931			374			199	
Approach Delay, s/veh		17.6			20.1			23.6			19.0	
Approach LOS		B			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	13.3	8.3	24.4	12.2	10.6	13.2	19.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	24.5	15.5	43.5	20.5	22.5	28.5	30.5
Max Q Clear Time (g_c+I1), s	2.9	3.6	4.9	11.0	6.8	5.7	8.5	9.8
Green Ext Time (p_c), s	0.0	0.2	0.1	5.1	0.9	0.5	0.5	5.2

Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	23	489	288	18	642	264	8	2	4
v/c Ratio	0.07	0.35	0.36	0.06	0.46	0.29	0.01	0.01	0.01
Control Delay	20.1	10.2	3.5	20.4	11.1	15.1	0.0	22.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	10.2	3.5	20.4	11.1	15.1	0.0	22.0	0.0
Queue Length 50th (ft)	3	25	0	3	35	18	0	0	0
Queue Length 95th (ft)	29	118	46	24	160	81	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	549	3288	1489	497	3278	2489	1466	392	1063
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.15	0.19	0.04	0.20	0.11	0.01	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	450	265	17	590	1	243	0	7	2	0	4
Future Volume (veh/h)	21	450	265	17	590	1	243	0	7	2	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	23	489	0	18	641	1	264	0	8	2	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	50	1127		40	1134	2	481	289	245	5	0	29
Arrive On Green	0.03	0.32	0.00	0.02	0.31	0.31	0.14	0.00	0.16	0.00	0.00	0.02
Sat Flow, veh/h	1767	3526	1572	1767	3612	6	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	23	489	0	18	313	329	264	0	8	2	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1855	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	0.5	4.0	0.0	0.4	5.3	5.3	2.6	0.0	0.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.5	4.0	0.0	0.4	5.3	5.3	2.6	0.0	0.2	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	50	1127		40	553	582	481	289	245	5	0	29
V/C Ratio(X)	0.46	0.43		0.45	0.57	0.57	0.55	0.00	0.03	0.41	0.00	0.14
Avail Cap(c_a), veh/h	515	4644		466	2273	2392	2329	1930	1635	368	0	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	9.7	0.0	17.4	10.3	10.3	14.4	0.0	12.9	18.0	0.0	17.4
Incr Delay (d2), s/veh	6.3	0.3	0.0	7.5	0.9	0.9	1.0	0.0	0.1	46.6	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.0	0.0	0.2	1.5	1.6	0.9	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	10.0	0.0	24.9	11.2	11.2	15.4	0.0	13.0	64.5	0.0	19.6
LnGrp LOS	C	A		C	B	B	B	A	B	E	A	B
Approach Vol, veh/h		512			660			272			6	
Approach Delay, s/veh		10.6			11.6			15.4			34.6	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	10.1	5.3	16.0	9.6	5.2	5.5	15.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	37.5	9.5	47.5	24.5	20.5	10.5	46.5
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.4	6.0	4.6	2.1	2.5	7.3
Green Ext Time (p_c), s	0.0	0.0	0.0	3.4	0.9	0.0	0.0	4.0

Intersection Summary			
HCM 6th Ctrl Delay			12.0
HCM 6th LOS			B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	380	85	11	396	247	53
v/c Ratio	0.33	0.15	0.03	0.30	0.26	0.11
Control Delay	9.0	3.9	12.8	6.4	10.1	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	3.9	12.8	6.4	10.1	5.1
Queue Length 50th (ft)	16	0	1	17	10	0
Queue Length 95th (ft)	65	21	12	37	48	19
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1339	3505	3336	1539
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.05	0.01	0.11	0.07	0.03

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	350	78	10	364	227	49
Future Volume (veh/h)	350	78	10	364	227	49
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	380	85	11	396	247	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	873	390	280	1952	521	239
Arrive On Green	0.25	0.25	0.16	0.55	0.15	0.15
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	380	85	11	396	247	53
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	2.8	1.3	0.2	1.7	2.0	0.9
Cycle Q Clear(g_c), s	2.8	1.3	0.2	1.7	2.0	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	873	390	280	1952	521	239
V/C Ratio(X)	0.44	0.22	0.04	0.20	0.47	0.22
Avail Cap(c_a), veh/h	5366	2394	1186	8252	4433	2033
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.7	9.1	10.9	3.4	11.8	11.4
Incr Delay (d2), s/veh	0.3	0.3	0.1	0.1	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.3	0.0	0.1	0.6	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.0	9.4	10.9	3.5	12.5	11.8
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	465			407	300	
Approach Delay, s/veh	9.9			3.7	12.4	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	9.1	9.3	12.1	21.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	39.5	20.5	46.5	71.5
Max Q Clear Time (g_c+I1), s	4.0	2.2	4.8	3.7
Green Ext Time (p_c), s	1.0	0.0	2.8	2.7

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	345	68	524	16	2	25	71	26
v/c Ratio	0.05	0.18	0.12	0.22	0.01	0.00	0.05	0.12	0.05
Control Delay	16.5	10.3	14.8	6.1	0.5	14.0	8.4	13.8	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	10.3	14.8	6.1	0.5	14.0	8.4	13.8	7.8
Queue Length 50th (ft)	4	31	12	24	0	0	1	12	0
Queue Length 95th (ft)	22	64	43	90	2	4	15	42	15
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	1091	3469	1318	3505	1568	1680	1459	1680	1440
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.10	0.05	0.15	0.01	0.00	0.02	0.04	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	313	5	63	482	15	2	3	20	65	1	23
Future Volume (veh/h)	22	313	5	63	482	15	2	3	20	65	1	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	340	5	68	524	16	2	3	22	71	1	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1073	16	131	1218	543	407	22	159	409	7	172
Arrive On Green	0.03	0.30	0.30	0.07	0.35	0.35	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3557	52	1767	3526	1572	1374	192	1410	1375	61	1521
Grp Volume(v), veh/h	24	168	177	68	524	16	2	0	25	71	0	26
Grp Sat Flow(s),veh/h/ln	1767	1763	1846	1767	1763	1572	1374	0	1602	1375	0	1582
Q Serve(g_s), s	0.4	1.9	2.0	1.0	3.0	0.2	0.0	0.0	0.4	1.3	0.0	0.4
Cycle Q Clear(g_c), s	0.4	1.9	2.0	1.0	3.0	0.2	0.4	0.0	0.4	1.7	0.0	0.4
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	54	532	557	131	1218	543	407	0	181	409	0	179
V/C Ratio(X)	0.44	0.32	0.32	0.52	0.43	0.03	0.00	0.00	0.14	0.17	0.00	0.15
Avail Cap(c_a), veh/h	1037	3103	3249	1639	7406	3303	2098	0	2152	2101	0	2125
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.6	7.1	7.1	11.8	6.6	5.7	10.8	0.0	10.6	11.3	0.0	10.6
Incr Delay (d2), s/veh	5.6	0.3	0.3	3.1	0.2	0.0	0.0	0.0	0.3	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.5	0.4	0.6	0.0	0.0	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	7.5	7.4	14.9	6.9	5.7	10.8	0.0	10.9	11.5	0.0	10.9
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		369			608			27			97	
Approach Delay, s/veh		8.2			7.8			10.9			11.4	
Approach LOS		A			A			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.5	6.5	12.5		7.5	5.3	13.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		35.5	24.5	46.5		35.5	15.5	55.5				
Max Q Clear Time (g_c+I1), s		2.4	3.0	4.0		3.7	2.4	5.0				
Green Ext Time (p_c), s		0.1	0.1	2.2		0.3	0.0	4.1				

Intersection Summary		
HCM 6th Ctrl Delay		8.3
HCM 6th LOS		A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	230	214	341	28	23	121	58	14	20
v/c Ratio	0.16	0.32	0.45	0.20	0.11	0.08	0.34	0.19	0.04	0.05
Control Delay	24.8	20.1	21.6	11.6	25.4	25.1	8.1	24.5	21.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	20.1	21.6	11.6	25.4	25.1	8.1	24.5	21.9	0.2
Queue Length 50th (ft)	13	31	59	35	8	7	0	16	3	0
Queue Length 95th (ft)	44	71	132	74	32	28	36	52	19	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	530	1786	1261	2793	827	1098	989	911	1156	1033
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.13	0.17	0.12	0.03	0.02	0.12	0.06	0.01	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	177	35	197	215	98	26	21	111	53	13	18
Future Volume (veh/h)	42	177	35	197	215	98	26	21	111	53	13	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	192	38	214	234	107	28	23	121	58	14	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	89	415	81	290	606	268	207	264	223	164	219	185
Arrive On Green	0.05	0.14	0.14	0.16	0.25	0.25	0.12	0.14	0.14	0.09	0.12	0.12
Sat Flow, veh/h	1767	2944	571	1767	2377	1052	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	46	113	117	214	172	169	28	23	121	58	14	20
Grp Sat Flow(s),veh/h/ln	1767	1763	1753	1767	1763	1666	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	1.0	2.3	2.4	4.5	3.1	3.3	0.6	0.4	2.8	1.2	0.3	0.4
Cycle Q Clear(g_c), s	1.0	2.3	2.4	4.5	3.1	3.3	0.6	0.4	2.8	1.2	0.3	0.4
Prop In Lane	1.00		0.33	1.00		0.63	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	89	248	247	290	449	425	207	264	223	164	219	185
V/C Ratio(X)	0.52	0.46	0.47	0.74	0.38	0.40	0.14	0.09	0.54	0.35	0.06	0.11
Avail Cap(c_a), veh/h	564	968	963	1512	1914	1809	880	1209	1024	971	1303	1105
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	15.4	15.5	15.6	12.0	12.1	15.5	14.6	15.6	16.6	15.3	15.4
Incr Delay (d2), s/veh	4.6	1.3	1.4	3.7	0.5	0.6	0.3	0.1	2.0	1.3	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.9	0.9	1.8	1.1	1.1	0.2	0.2	1.0	0.5	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	16.7	16.9	19.2	12.6	12.7	15.8	14.7	17.6	17.9	15.5	15.7
LnGrp LOS	C	B	B	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		276			555			172			92	
Approach Delay, s/veh		17.8			15.2			17.0			17.1	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	10.1	10.9	10.0	9.1	9.1	6.5	14.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	21.5	25.5	33.5	21.5	19.5	27.5	12.5	42.5				
Max Q Clear Time (g_c+I1), s	3.2	4.8	6.5	4.4	2.6	2.4	3.0	5.3				
Green Ext Time (p_c), s	0.1	0.4	0.6	1.1	0.0	0.1	0.0	2.2				

Intersection Summary			
HCM 6th Ctrl Delay			16.3
HCM 6th LOS			B

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	147	14	489	45	238
v/c Ratio	0.15	0.03	0.29	0.10	0.11
Control Delay	13.1	8.9	8.0	14.6	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	8.9	8.0	14.6	4.3
Queue Length 50th (ft)	7	0	17	5	9
Queue Length 95th (ft)	35	12	72	31	20
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2935	1232	3340	1273	3505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.15	0.04	0.07

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	133	15	310	140	41	219
Future Volume (veh/h)	133	15	310	140	41	219
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	145	16	337	152	45	238
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	460	204	749	332	94	1888
Arrive On Green	0.13	0.13	0.32	0.32	0.05	0.54
Sat Flow, veh/h	3534	1572	2470	1052	1767	3618
Grp Volume(v), veh/h	145	16	248	241	45	238
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1666	1767	1763
Q Serve(g_s), s	1.0	0.2	3.0	3.1	0.7	0.9
Cycle Q Clear(g_c), s	1.0	0.2	3.0	3.1	0.7	0.9
Prop In Lane	1.00	1.00		0.63	1.00	
Lane Grp Cap(c), veh/h	460	204	556	525	94	1888
V/C Ratio(X)	0.32	0.08	0.45	0.46	0.48	0.13
Avail Cap(c_a), veh/h	3743	1665	3701	3498	1412	10809
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.6	10.3	7.3	7.4	12.4	3.1
Incr Delay (d2), s/veh	0.4	0.2	0.6	0.6	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.7	0.7	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.0	10.4	7.9	8.0	16.1	3.1
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	161		489			283
Approach Delay, s/veh	11.0		8.0			5.2
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.9	13.0				18.9		8.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	21.5	56.5				82.5		28.5
Max Q Clear Time (g_c+I1), s	2.7	5.1				2.9		3.0
Green Ext Time (p_c), s	0.1	3.4				1.7		0.5

Intersection Summary			
HCM 6th Ctrl Delay			7.6
HCM 6th LOS			A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	146	46	243	112	52
v/c Ratio	0.30	0.03	0.30	0.15	0.15
Control Delay	13.5	3.6	6.4	11.5	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	3.6	6.4	11.5	6.6
Queue Length 50th (ft)	23	1	6	7	0
Queue Length 95th (ft)	60	5	28	23	20
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1749	3505	2963	3156	1351
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	0.08	0.04	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	134	42	71	153	83	68
Future Volume (veh/h)	134	42	71	153	83	68
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	146	46	77	166	108	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	224	1793	359	320	477	212
Arrive On Green	0.13	0.51	0.20	0.20	0.13	0.13
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	146	46	77	166	108	55
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	2.0	0.2	0.9	2.4	0.7	0.8
Cycle Q Clear(g_c), s	2.0	0.2	0.9	2.4	0.7	0.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	224	1793	359	320	477	212
V/C Ratio(X)	0.65	0.03	0.21	0.52	0.23	0.26
Avail Cap(c_a), veh/h	2835	10961	2339	2086	4549	2024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.5	3.1	8.4	9.0	9.7	9.8
Incr Delay (d2), s/veh	3.2	0.0	0.3	1.3	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.2	0.6	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.7	3.1	8.7	10.3	10.0	10.4
LnGrp LOS	B	A	A	B	A	B
Approach Vol, veh/h		192	243		163	
Approach Delay, s/veh		11.1	9.8		10.1	
Approach LOS		B	A		B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	17.3	7.9	7.7	9.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	78.5	32.5	40.5	33.5
Max Q Clear Time (g_c+I1), s	2.2	2.8	4.0	4.4
Green Ext Time (p_c), s	0.3	0.5	0.4	1.5

Intersection Summary	
HCM 6th Ctrl Delay	10.3
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	7	114	3	27	193	229	9	301
v/c Ratio	0.09	0.02	0.31	0.01	0.10	0.40	0.10	0.03	0.35
Control Delay	21.1	20.3	6.6	22.3	14.1	17.6	6.6	21.8	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	20.3	6.6	22.3	14.1	17.6	6.6	21.8	15.8
Queue Length 50th (ft)	5	1	0	1	1	35	7	2	27
Queue Length 95th (ft)	28	12	30	8	22	115	51	15	82
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	539	1224	1086	351	952	1481	3461	398	2779
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.10	0.01	0.03	0.13	0.07	0.02	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	6	105	3	6	18	178	207	4	8	237	40
Future Volume (veh/h)	23	6	105	3	6	18	178	207	4	8	237	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	7	114	3	7	20	193	225	4	9	258	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	55	256	217	7	47	135	265	1142	20	21	559	92
Arrive On Green	0.03	0.14	0.14	0.00	0.11	0.11	0.15	0.32	0.32	0.01	0.18	0.18
Sat Flow, veh/h	1767	1856	1572	1767	424	1213	1767	3544	63	1767	3030	498
Grp Volume(v), veh/h	25	7	114	3	0	27	193	112	117	9	149	152
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1637	1767	1763	1844	1767	1763	1766
Q Serve(g_s), s	0.5	0.1	2.3	0.1	0.0	0.5	3.6	1.6	1.6	0.2	2.6	2.6
Cycle Q Clear(g_c), s	0.5	0.1	2.3	0.1	0.0	0.5	3.6	1.6	1.6	0.2	2.6	2.6
Prop In Lane	1.00		1.00	1.00		0.74	1.00		0.03	1.00		0.28
Lane Grp Cap(c), veh/h	55	256	217	7	0	182	265	568	594	21	325	326
V/C Ratio(X)	0.46	0.03	0.53	0.41	0.00	0.15	0.73	0.20	0.20	0.43	0.46	0.47
Avail Cap(c_a), veh/h	591	1377	1167	386	0	1024	1826	3103	3247	437	1718	1721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	12.8	13.8	17.1	0.0	13.8	13.9	8.4	8.4	16.9	12.5	12.5
Incr Delay (d2), s/veh	5.9	0.0	2.0	33.5	0.0	0.4	3.8	0.2	0.2	12.9	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.8	0.1	0.0	0.2	1.4	0.4	0.4	0.1	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	12.9	15.7	50.6	0.0	14.2	17.8	8.6	8.6	29.8	13.5	13.6
LnGrp LOS	C	B	B	D	A	B	B	A	A	C	B	B
Approach Vol, veh/h		146			30			422			310	
Approach Delay, s/veh		16.7			17.8			12.8			14.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.9	15.6	4.6	9.2	9.7	10.8	5.6	8.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.5	60.5	7.5	25.5	35.5	33.5	11.5	21.5
Max Q Clear Time (g_c+I1), s	2.2	3.6	2.1	4.3	5.6	4.6	2.5	2.5
Green Ext Time (p_c), s	0.0	1.3	0.0	0.3	0.5	1.7	0.0	0.1

Intersection Summary		
HCM 6th Ctrl Delay		14.0
HCM 6th LOS		B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	694	115	260	405	289	159	271
v/c Ratio	0.55	0.75	0.52	0.32	0.78	0.32	0.59	0.56
Control Delay	48.6	31.0	50.2	30.3	41.8	27.4	48.4	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	31.0	50.2	30.3	41.8	27.4	48.4	29.3
Queue Length 50th (ft)	73	148	62	60	210	65	85	46
Queue Length 95th (ft)	158	267	142	120	372	117	180	103
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	367	1206	300	1045	798	1620	400	881
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.58	0.38	0.25	0.51	0.18	0.40	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	360	279	106	204	35	373	227	39	146	151	98
Future Volume (veh/h)	125	360	279	106	204	35	373	227	39	146	151	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	136	391	0	115	222	0	405	247	0	159	164	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	180	661		151	604		490	906		210	346	
Arrive On Green	0.10	0.19	0.00	0.09	0.17	0.00	0.28	0.26	0.00	0.12	0.10	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	136	391	0	115	222	0	405	247	0	159	164	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	3.8	5.2	0.0	3.3	2.9	0.0	11.0	2.9	0.0	4.5	2.3	0.0
Cycle Q Clear(g_c), s	3.8	5.2	0.0	3.3	2.9	0.0	11.0	2.9	0.0	4.5	2.3	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	180	661		151	604		490	906		210	346	
V/C Ratio(X)	0.76	0.59		0.76	0.37		0.83	0.27		0.76	0.47	
Avail Cap(c_a), veh/h	611	1963		501	1743		1329	2734		666	1412	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	19.0	0.0	22.9	18.8	0.0	17.3	15.2	0.0	21.8	21.8	0.0
Incr Delay (d2), s/veh	6.4	0.8	0.0	7.7	0.4	0.0	3.6	0.2	0.0	5.6	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.9	0.0	1.5	1.1	0.0	4.2	1.0	0.0	2.0	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	19.8	0.0	30.6	19.1	0.0	20.9	15.4	0.0	27.4	22.8	0.0
LnGrp LOS	C	B		C	B		C	B		C	C	
Approach Vol, veh/h		527			337			652			323	
Approach Delay, s/veh		22.2			23.1			18.8			25.1	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	17.6	8.9	14.1	18.7	9.5	9.7	13.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	19.3	39.7	14.5	28.5	38.5	20.5	17.7	25.3				
Max Q Clear Time (g_c+I1), s	6.5	4.9	5.3	7.2	13.0	4.3	5.8	4.9				
Green Ext Time (p_c), s	0.3	1.6	0.2	2.4	1.2	0.8	0.2	1.2				

Intersection Summary		
HCM 6th Ctrl Delay		21.7
HCM 6th LOS		C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	589	358	373	271	437
v/c Ratio	0.65	0.69	0.17	0.62	0.61
Control Delay	26.7	33.0	6.6	33.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	33.0	6.6	33.8	7.0
Queue Length 50th (ft)	104	137	31	105	0
Queue Length 95th (ft)	224	312	70	246	78
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1471	1009	3185	957	1055
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.35	0.12	0.28	0.41

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	358	184	329	343	249	402
Future Volume (veh/h)	358	184	329	343	249	402
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	389	200	358	373	271	437
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	539	274	421	1914	573	510
Arrive On Green	0.24	0.24	0.24	0.54	0.32	0.32
Sat Flow, veh/h	2356	1148	1767	3618	1767	1572
Grp Volume(v), veh/h	302	287	358	373	271	437
Grp Sat Flow(s),veh/h/ln	1763	1649	1767	1763	1767	1572
Q Serve(g_s), s	10.7	10.9	13.1	3.7	8.3	17.6
Cycle Q Clear(g_c), s	10.7	10.9	13.1	3.7	8.3	17.6
Prop In Lane		0.70	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	420	393	421	1914	573	510
V/C Ratio(X)	0.72	0.73	0.85	0.19	0.47	0.86
Avail Cap(c_a), veh/h	766	717	1028	3818	976	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	23.8	24.7	7.9	18.3	21.5
Incr Delay (d2), s/veh	2.3	2.6	4.9	0.0	0.6	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	4.2	5.6	1.2	3.3	6.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.1	26.5	29.6	8.0	18.9	25.8
LnGrp LOS	C	C	C	A	B	C
Approach Vol, veh/h	589			731	708	
Approach Delay, s/veh	26.3			18.5	23.2	
Approach LOS	C			B	C	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		26.5	20.7	20.7				41.4
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		37.5	39.5	29.5				73.5
Max Q Clear Time (g_c+I1), s		19.6	15.1	12.9				5.7
Green Ext Time (p_c), s		2.4	1.1	3.3				2.6

Intersection Summary			
HCM 6th Ctrl Delay			22.4
HCM 6th LOS			C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	20	640	77	585	123	78
v/c Ratio	0.06	0.38	0.19	0.27	0.30	0.10
Control Delay	23.0	12.2	20.8	7.5	19.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	12.2	20.8	7.5	19.7	0.3
Queue Length 50th (ft)	5	71	18	33	29	0
Queue Length 95th (ft)	24	139	59	115	81	0
Internal Link Dist (ft)		424		851		1161
Turn Bay Length (ft)	125		125		75	
Base Capacity (vph)	668	3232	984	3456	1128	1346
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.20	0.08	0.17	0.11	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	501	87	71	537	1	113	0	72	0	0	0
Future Volume (veh/h)	18	501	87	71	537	1	113	0	72	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	545	95	77	584	1	123	0	78	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	45	1050	182	138	1453	2	470	0	210	234	247	0
Arrive On Green	0.03	0.35	0.35	0.08	0.40	0.40	0.13	0.00	0.13	0.00	0.00	0.00
Sat Flow, veh/h	1767	3003	522	1767	3611	6	1767	0	1572	1311	1856	0
Grp Volume(v), veh/h	20	319	321	77	285	300	123	0	78	0	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1762	1767	1763	1854	1767	0	1572	1311	1856	0
Q Serve(g_s), s	0.3	4.4	4.5	1.3	3.5	3.5	2.0	0.0	1.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	4.4	4.5	1.3	3.5	3.5	2.0	0.0	1.4	0.0	0.0	0.0
Prop In Lane	1.00		0.30	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	45	616	616	138	709	746	470	0	210	234	247	0
V/C Ratio(X)	0.44	0.52	0.52	0.56	0.40	0.40	0.26	0.00	0.37	0.00	0.00	0.00
Avail Cap(c_a), veh/h	660	2835	2834	1177	3351	3525	2330	0	1865	1614	2201	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	14.8	7.9	8.0	13.7	6.6	6.6	12.4	0.0	12.2	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.7	0.7	0.7	3.5	0.4	0.3	0.3	0.0	1.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.1	1.1	0.5	0.7	0.8	0.6	0.0	0.4	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	8.6	8.6	17.1	6.9	6.9	12.7	0.0	13.3	0.0	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	B	A	A	A
Approach Vol, veh/h		660			662			201			0	
Approach Delay, s/veh		9.0			8.1			12.9			0.0	
Approach LOS		A			A			B				
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		8.6	6.9	15.3		8.6	5.3	16.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		36.5	20.5	49.5		36.5	11.5	58.5				
Max Q Clear Time (g_c+I1), s		4.0	3.3	6.5		0.0	2.3	5.5				
Green Ext Time (p_c), s		0.8	0.1	4.3		0.0	0.0	3.8				
Intersection Summary												
HCM 6th Ctrl Delay			9.1									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	374	382	706	271	207	79	895
v/c Ratio	0.60	0.20	0.71	0.48	0.49	0.18	0.79
Control Delay	36.5	10.9	29.4	36.0	9.8	35.3	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	10.9	29.4	36.0	9.8	35.3	8.5
Queue Length 50th (ft)	84	45	145	62	0	18	0
Queue Length 95th (ft)	176	102	286	134	64	45	57
Internal Link Dist (ft)		852	424	1178			
Turn Bay Length (ft)	275				450	100	300
Base Capacity (vph)	909	2644	1472	900	556	1320	1619
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.14	0.48	0.30	0.37	0.06	0.55

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	351	0	0	472	178	0	249	190	73	0	823
Future Volume (veh/h)	344	351	0	0	472	178	0	249	190	73	0	823
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	0	1856	1856	1856	0	1856
Adj Flow Rate, veh/h	374	382	0	0	513	193	0	271	207	79	0	895
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	3	3	0	3
Cap, veh/h	532	1839	0	0	728	273	0	661	295	211	0	0
Arrive On Green	0.16	0.52	0.00	0.00	0.29	0.29	0.00	0.19	0.19	0.06	0.00	0.00
Sat Flow, veh/h	3428	3618	0	0	2602	940	0	3618	1572	3428	79	
Grp Volume(v), veh/h	374	382	0	0	360	346	0	271	207	79	27.6	
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1763	1686	0	1763	1572	1714	C	
Q Serve(g_s), s	6.1	3.4	0.0	0.0	10.7	10.8	0.0	4.0	7.3	1.3		
Cycle Q Clear(g_c), s	6.1	3.4	0.0	0.0	10.7	10.8	0.0	4.0	7.3	1.3		
Prop In Lane	1.00		0.00	0.00		0.56	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	532	1839	0	0	512	489	0	661	295	211		
V/C Ratio(X)	0.70	0.21	0.00	0.00	0.70	0.71	0.00	0.41	0.70	0.37		
Avail Cap(c_a), veh/h	1182	3443	0	0	979	937	0	1168	521	1718		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	23.6	7.6	0.0	0.0	18.6	18.7	0.0	21.1	22.4	26.5		
Incr Delay (d2), s/veh	1.7	0.1	0.0	0.0	1.8	1.9	0.0	0.4	3.0	1.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.4	1.0	0.0	0.0	4.1	4.0	0.0	1.6	2.7	0.5		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	7.6	0.0	0.0	20.4	20.6	0.0	21.5	25.4	27.6		
LnGrp LOS	C	A	A	A	C	C	A	C	C	C		
Approach Vol, veh/h		756			706			478				
Approach Delay, s/veh		16.4			20.5			23.2				
Approach LOS		B			C			C				
Timer - Assigned Phs	1	2		4			7	8				
Phs Duration (G+Y+Rc), s	8.1	15.5		35.2			13.6	21.6				
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s	29.5	19.5		57.5			20.3	32.7				
Max Q Clear Time (g_c+I1), s	3.3	9.3		5.4			8.1	12.8				
Green Ext Time (p_c), s	0.2	1.8		2.7			1.1	4.3				
Intersection Summary												
HCM 6th Ctrl Delay			19.9									
HCM 6th LOS			B									

Lane Group	EBL	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL	SWR
Lane Group Flow (vph)	76	535	364	316	1085	122	138	148	122	317
v/c Ratio	0.47	0.48	0.49	0.61	0.76	0.50	0.54	0.43	0.38	0.80
Control Delay	58.1	28.1	5.4	46.7	29.8	50.9	51.5	11.8	41.4	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	28.1	5.4	46.7	29.8	50.9	51.5	11.8	41.4	38.5
Queue Length 50th (ft)	45	133	0	95	306	72	81	0	67	108
Queue Length 95th (ft)	#112	221	65	168	464	150	167	59	139	240
Internal Link Dist (ft)		693			852		265		1072	
Turn Bay Length (ft)	150		200	285		125		125		
Base Capacity (vph)	192	1651	931	694	1935	364	383	443	515	557
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.32	0.39	0.46	0.56	0.34	0.36	0.33	0.24	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	70	492	335	291	837	161	112	127	136	112	0	264
Future Volume (vph)	70	492	335	291	837	161	112	127	136	112	0	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	1568	3400	3420		1752	1845	1568		1752	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	1568	3400	3420		1752	1845	1568		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	535	364	316	910	175	122	138	148	122	0	287
RTOR Reduction (vph)	0	0	242	0	0	0	0	0	128	0	0	111
Lane Group Flow (vph)	76	535	122	316	1085	0	122	138	20	0	122	206
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Prot	Prot	Prot	Prot
Protected Phases	5	2		1	6		4	4	4	8	8	8
Permitted Phases			2									
Actuated Green, G (s)	6.7	31.6	31.6	14.3	39.2		13.0	13.0	13.0		17.2	17.2
Effective Green, g (s)	6.7	31.6	31.6	14.3	39.2		13.0	13.0	13.0		17.2	17.2
Actuated g/C Ratio	0.07	0.34	0.34	0.15	0.42		0.14	0.14	0.14		0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	124	1177	526	516	1424		242	254	216		320	286
v/s Ratio Prot	0.04	0.15		c0.09	c0.32		0.07	c0.07	0.01		0.07	c0.13
v/s Ratio Perm			0.08									
v/c Ratio	0.61	0.45	0.23	0.61	0.76		0.50	0.54	0.09		0.38	0.72
Uniform Delay, d1	42.4	24.5	22.5	37.3	23.5		37.6	37.8	35.4		33.8	36.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.7	0.3	0.2	2.2	2.5		1.7	2.4	0.2		0.8	8.4
Delay (s)	51.1	24.8	22.7	39.5	25.9		39.2	40.2	35.6		34.5	44.6
Level of Service	D	C	C	D	C		D	D	D		C	D
Approach Delay (s)		26.1			29.0			38.2			41.8	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	28
Future Volume (vph)	28
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	30
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	33	78	350	79	180	230
v/c Ratio	0.09	0.19	0.31	0.14	0.32	0.11
Control Delay	17.0	7.1	13.3	5.0	15.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	7.1	13.3	5.0	15.0	3.2
Queue Length 50th (ft)	6	0	33	0	33	8
Queue Length 95th (ft)	27	27	70	23	83	17
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1281	1168	3273	1469	1674	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.11	0.05	0.11	0.07

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	72	322	73	166	212
Future Volume (veh/h)	30	72	322	73	166	212
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	33	78	350	79	180	230
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	182	162	855	381	309	2035
Arrive On Green	0.10	0.10	0.24	0.24	0.17	0.58
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	33	78	350	79	180	230
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	0.5	1.3	2.4	1.1	2.6	0.8
Cycle Q Clear(g_c), s	0.5	1.3	2.4	1.1	2.6	0.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	182	162	855	381	309	2035
V/C Ratio(X)	0.18	0.48	0.41	0.21	0.58	0.11
Avail Cap(c_a), veh/h	1726	1536	4822	2151	2542	10457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.9	9.0	8.5	10.7	2.7
Incr Delay (d2), s/veh	0.5	2.2	0.3	0.3	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.5	0.2	0.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.0	14.1	9.3	8.8	12.4	2.7
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	111		429			410
Approach Delay, s/veh	13.5		9.2			7.0
Approach LOS	B		A			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	9.4	11.3	20.8	7.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	40.5	38.5	83.5	27.5
Max Q Clear Time (g_c+I1), s	4.6	4.4	2.8	3.3
Green Ext Time (p_c), s	0.5	2.5	1.5	0.3

Intersection Summary	
HCM 6th Ctrl Delay	8.7
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	57	86	138	137	92	36	307	84	114	498
v/c Ratio	0.16	0.21	0.30	0.23	0.16	0.10	0.25	0.21	0.13	0.50
Control Delay	25.9	23.7	24.4	21.7	2.7	26.8	20.1	25.4	17.5	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	23.7	24.4	21.7	2.7	26.8	20.1	25.4	17.5	4.5
Queue Length 50th (ft)	17	23	41	39	0	11	44	25	22	0
Queue Length 95th (ft)	55	70	103	99	17	40	94	72	79	70
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	625	866	864	1137	1018	474	2777	721	1655	1458
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.10	0.16	0.12	0.09	0.08	0.11	0.12	0.07	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	65	14	127	126	85	33	245	38	77	105	458
Future Volume (veh/h)	52	65	14	127	126	85	33	245	38	77	105	458
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	71	15	138	137	92	36	266	41	84	114	498
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	98	152	32	184	281	238	70	1081	165	123	710	602
Arrive On Green	0.06	0.10	0.10	0.10	0.15	0.15	0.04	0.35	0.35	0.07	0.38	0.38
Sat Flow, veh/h	1767	1485	314	1767	1856	1572	1767	3067	467	1767	1856	1572
Grp Volume(v), veh/h	57	0	86	138	137	92	36	151	156	84	114	498
Grp Sat Flow(s),veh/h/ln	1767	0	1799	1767	1856	1572	1767	1763	1771	1767	1856	1572
Q Serve(g_s), s	1.5	0.0	2.2	3.7	3.3	2.6	1.0	3.0	3.0	2.3	2.0	13.9
Cycle Q Clear(g_c), s	1.5	0.0	2.2	3.7	3.3	2.6	1.0	3.0	3.0	2.3	2.0	13.9
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	98	0	184	184	281	238	70	621	625	123	710	602
V/C Ratio(X)	0.58	0.00	0.47	0.75	0.49	0.39	0.51	0.24	0.25	0.68	0.16	0.83
Avail Cap(c_a), veh/h	419	0	760	783	1167	989	310	1617	1625	565	1970	1670
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	20.5	21.1	18.9	18.6	22.8	11.1	11.1	22.0	9.8	13.5
Incr Delay (d2), s/veh	5.4	0.0	1.8	6.0	1.3	1.0	5.7	0.2	0.2	6.4	0.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.9	1.7	1.4	0.9	0.5	1.0	1.0	1.1	0.7	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	0.0	22.4	27.1	20.2	19.6	28.6	11.3	11.4	28.5	9.9	16.5
LnGrp LOS	C	A	C	C	C	B	C	B	B	C	A	B
Approach Vol, veh/h		143			367			343			696	
Approach Delay, s/veh		24.5			22.7			13.1			16.9	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	21.6	9.5	9.5	6.4	23.1	7.2	11.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	15.5	44.5	21.5	20.5	8.5	51.5	11.5	30.5				
Max Q Clear Time (g_c+I1), s	4.3	5.0	5.7	4.2	3.0	15.9	3.5	5.3				
Green Ext Time (p_c), s	0.1	1.9	0.3	0.3	0.0	2.7	0.1	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	425	903	561	36	1515	207
v/c Ratio	0.44	0.75	0.27	0.04	0.74	0.13
Control Delay	25.3	13.9	8.7	3.1	14.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	13.9	8.7	3.1	14.7	0.2
Queue Length 50th (ft)	79	67	57	0	232	0
Queue Length 95th (ft)	173	206	128	13	479	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	2286	2044	3293	1475	3293	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.44	0.17	0.02	0.46	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	391	0	831	0	516	33	0	1394	190
Future Volume (veh/h)	0	0	0	391	0	831	0	516	33	0	1394	190
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				425	0	903	0	561	36	0	1515	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1282	0	1035	0	1888	842	0	1888	
Arrive On Green				0.37	0.00	0.37	0.00	0.54	0.54	0.00	0.54	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				425	0	903	0	561	36	0	1515	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				8.8	0.0	30.1	0.0	8.7	1.1	0.0	34.7	0.0
Cycle Q Clear(g_c), s				8.8	0.0	30.1	0.0	8.7	1.1	0.0	34.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1282	0	1035	0	1888	842	0	1888	
V/C Ratio(X)				0.33	0.00	0.87	0.00	0.30	0.04	0.00	0.80	
Avail Cap(c_a), veh/h				1607	0	1298	0	3004	1340	0	3004	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				22.2	0.0	28.9	0.0	12.7	11.0	0.0	18.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	5.7	0.0	0.1	0.0	0.0	0.9	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.4	0.0	10.2	0.0	3.2	0.4	0.0	12.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.3	0.0	34.5	0.0	12.8	11.0	0.0	19.6	0.0
LnGrp LOS				C	A	C	A	B	B	A	B	
Approach Vol, veh/h					1328			597			1515	
Approach Delay, s/veh					30.6			12.7			19.6	
Approach LOS					C			B			B	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		57.6				57.6		41.6				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		84.5				84.5		46.5				
Max Q Clear Time (g_c+I1), s		10.7				36.7		32.1				
Green Ext Time (p_c), s		4.1				16.4		5.0				
Intersection Summary												
HCM 6th Ctrl Delay			22.7									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	322	657	992	141	781	1021	269	61	73	249
v/c Ratio	0.83	0.64	0.63	0.68	0.82	0.87	0.42	0.40	0.43	0.43
Control Delay	59.1	37.1	2.0	63.9	49.7	42.0	19.9	55.4	55.2	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	37.1	2.0	63.9	49.7	42.0	19.9	55.4	55.2	18.3
Queue Length 50th (ft)	218	217	0	97	196	343	92	42	50	79
Queue Length 95th (ft)	#383	295	0	#188	#280	#480	174	85	97	149
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	424	1066	1568	232	968	1295	712	312	356	613
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.62	0.63	0.61	0.81	0.79	0.38	0.20	0.21	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	296	604	913	130	650	68	939	82	166	56	67	229
Future Volume (veh/h)	296	604	913	130	650	68	939	82	166	56	67	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	322	657	0	141	707	74	1021	89	0	61	73	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	968		169	799	83	1105	771		93	270	541
Arrive On Green	0.20	0.27	0.00	0.10	0.17	0.17	0.32	0.42	0.00	0.05	0.15	0.15
Sat Flow, veh/h	1767	3526	1572	1767	4661	484	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	322	657	0	141	511	270	1021	89	0	61	73	249
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1768	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	19.8	18.5	0.0	8.7	16.4	16.6	32.0	3.3	0.0	3.8	3.9	13.7
Cycle Q Clear(g_c), s	19.8	18.5	0.0	8.7	16.4	16.6	32.0	3.3	0.0	3.8	3.9	13.7
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	351	968		169	579	303	1105	771		93	270	541
V/C Ratio(X)	0.92	0.68		0.83	0.88	0.89	0.92	0.12		0.66	0.27	0.46
Avail Cap(c_a), veh/h	389	970		213	592	310	1187	771		286	325	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	36.0	0.0	49.4	45.0	45.1	36.4	20.0	0.0	51.7	42.3	28.4
Incr Delay (d2), s/veh	24.7	1.9	0.0	19.7	14.4	25.6	11.5	0.1	0.0	7.6	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.8	8.0	0.0	4.7	7.8	9.2	14.9	1.4	0.0	1.9	1.8	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.3	37.9	0.0	69.1	59.4	70.6	47.9	20.0	0.0	59.3	42.8	29.0
LnGrp LOS	E	D		E	E	E	D	C		E	D	C
Approach Vol, veh/h		979			922			1110			383	
Approach Delay, s/veh		47.9			64.2			45.6			36.5	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	50.7	15.2	35.0	40.4	20.7	26.6	23.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	40.0	13.4	30.6	38.5	19.5	24.5	19.5
Max Q Clear Time (g_c+I1), s	5.8	5.3	10.7	20.5	34.0	15.7	21.8	18.6
Green Ext Time (p_c), s	0.1	0.5	0.1	3.0	1.9	0.5	0.3	0.4

Intersection Summary	
HCM 6th Ctrl Delay	50.3
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	57	684	245	32	709	172	27	2	4
v/c Ratio	0.15	0.34	0.24	0.09	0.40	0.21	0.04	0.01	0.01
Control Delay	22.4	9.9	2.9	23.6	12.3	20.0	0.1	26.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	9.9	2.9	23.6	12.3	20.0	0.1	26.0	0.0
Queue Length 50th (ft)	13	34	0	7	74	19	0	1	0
Queue Length 95th (ft)	55	164	40	37	178	62	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	838	3335	1504	589	3286	1749	1251	421	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.21	0.16	0.05	0.22	0.10	0.02	0.00	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	629	225	29	652	0	158	0	25	2	0	4
Future Volume (veh/h)	52	629	225	29	652	0	158	0	25	2	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	684	0	32	709	0	172	0	27	2	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	104	1294		66	1219	0	365	264	224	5	0	60
Arrive On Green	0.06	0.37	0.00	0.04	0.35	0.00	0.11	0.00	0.14	0.00	0.00	0.04
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	57	684	0	32	709	0	172	0	27	2	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.3	6.1	0.0	0.7	6.6	0.0	1.9	0.0	0.6	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.3	6.1	0.0	0.7	6.6	0.0	1.9	0.0	0.6	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	104	1294		66	1219	0	365	264	224	5	0	60
V/C Ratio(X)	0.55	0.53		0.48	0.58	0.00	0.47	0.00	0.12	0.41	0.00	0.07
Avail Cap(c_a), veh/h	686	4810		465	4369	0	1502	1370	1161	332	0	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.3	9.9	0.0	18.8	10.7	0.0	16.8	0.0	15.0	19.9	0.0	18.5
Incr Delay (d2), s/veh	4.5	0.3	0.0	5.4	0.4	0.0	0.9	0.0	0.2	47.6	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.6	0.0	0.3	1.8	0.0	0.7	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	10.3	0.0	24.2	11.1	0.0	17.7	0.0	15.2	67.5	0.0	19.0
LnGrp LOS	C	B		C	B	A	B	A	B	E	A	B
Approach Vol, veh/h		741			741			199			6	
Approach Delay, s/veh		11.2			11.7			17.4			35.1	
Approach LOS		B			B			B			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.6	10.2	6.0	19.2	8.8	6.0	6.8	18.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	29.5	10.5	54.5	17.5	19.5	15.5	49.5				
Max Q Clear Time (g_c+I1), s	2.0	2.6	2.7	8.1	3.9	2.1	3.3	8.6				
Green Ext Time (p_c), s	0.0	0.0	0.0	5.0	0.4	0.0	0.1	5.2				
Intersection Summary												
HCM 6th Ctrl Delay			12.3									
HCM 6th LOS			B									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	464	220	40	572	125	22
v/c Ratio	0.27	0.25	0.09	0.27	0.14	0.05
Control Delay	8.8	3.0	14.9	4.6	13.6	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	3.0	14.9	4.6	13.6	8.5
Queue Length 50th (ft)	19	0	4	25	6	0
Queue Length 95th (ft)	76	32	29	45	31	14
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1433	3505	2951	1364
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.14	0.03	0.16	0.04	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	427	202	37	526	115	20
Future Volume (veh/h)	427	202	37	526	115	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	464	220	40	572	125	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1065	475	278	2120	393	180
Arrive On Green	0.30	0.30	0.16	0.60	0.11	0.11
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	464	220	40	572	125	22
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	3.4	3.6	0.6	2.4	1.1	0.4
Cycle Q Clear(g_c), s	3.4	3.6	0.6	2.4	1.1	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1065	475	278	2120	393	180
V/C Ratio(X)	0.44	0.46	0.14	0.27	0.32	0.12
Avail Cap(c_a), veh/h	5733	2557	1423	9072	3193	1465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	9.0	11.5	3.0	12.9	12.6
Incr Delay (d2), s/veh	0.3	0.7	0.2	0.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.8	0.2	0.1	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.7	11.7	3.1	13.3	12.9
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	684			612	147	
Approach Delay, s/veh	9.3			3.6	13.3	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	8.1	9.5	14.1	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	25.5	51.5	81.5
Max Q Clear Time (g_c+I1), s	3.1	2.6	5.6	4.4
Green Ext Time (p_c), s	0.4	0.1	4.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	7.3
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	979	203	886	40	17	185	133	91
v/c Ratio	0.36	0.71	0.58	0.49	0.05	0.06	0.38	0.60	0.22
Control Delay	44.3	24.4	39.7	15.1	2.5	29.6	8.9	44.0	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	24.4	39.7	15.1	2.5	29.6	8.9	44.0	11.8
Queue Length 50th (ft)	33	194	87	144	0	6	5	56	6
Queue Length 95th (ft)	102	385	215	271	12	29	64	152	50
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	303	2292	618	2768	1250	597	828	466	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.43	0.33	0.32	0.03	0.03	0.22	0.29	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	864	37	187	815	37	16	12	158	122	15	69
Future Volume (veh/h)	69	864	37	187	815	37	16	12	158	122	15	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	939	40	203	886	40	17	13	172	133	16	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	103	1323	56	259	1664	742	385	28	372	299	72	336
Arrive On Green	0.06	0.38	0.38	0.15	0.47	0.47	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1767	3445	147	1767	3526	1572	1295	112	1478	1189	284	1332
Grp Volume(v), veh/h	75	480	499	203	886	40	17	0	185	133	0	91
Grp Sat Flow(s),veh/h/ln	1767	1763	1829	1767	1763	1572	1295	0	1590	1189	0	1616
Q Serve(g_s), s	2.6	14.3	14.3	6.9	11.0	0.9	0.7	0.0	6.1	6.6	0.0	2.8
Cycle Q Clear(g_c), s	2.6	14.3	14.3	6.9	11.0	0.9	3.4	0.0	6.1	12.7	0.0	2.8
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.93	1.00		0.82
Lane Grp Cap(c), veh/h	103	677	702	259	1664	742	385	0	401	299	0	407
V/C Ratio(X)	0.73	0.71	0.71	0.78	0.53	0.05	0.04	0.00	0.46	0.45	0.00	0.22
Avail Cap(c_a), veh/h	356	1350	1401	726	3438	1534	758	0	858	641	0	873
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	16.2	16.2	25.5	11.6	8.9	19.7	0.0	19.6	25.0	0.0	18.4
Incr Delay (d2), s/veh	9.3	1.4	1.3	5.2	0.3	0.0	0.0	0.0	0.8	1.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	5.4	5.6	3.1	3.7	0.3	0.2	0.0	2.2	1.8	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	17.6	17.5	30.7	11.8	8.9	19.8	0.0	20.5	26.1	0.0	18.7
LnGrp LOS	D	B	B	C	B	A	B	A	C	C	A	B
Approach Vol, veh/h		1054			1129			202			224	
Approach Delay, s/veh		19.0			15.1			20.4			23.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		20.1	13.6	28.3		20.1	8.1	33.8
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.5	25.5	47.5		33.5	12.5	60.5
Max Q Clear Time (g_c+I1), s		8.1	8.9	16.3		14.7	4.6	13.0
Green Ext Time (p_c), s		1.2	0.5	7.5		0.9	0.1	8.0

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	580	436	542	92	48	449	109	58	60
v/c Ratio	0.40	0.69	0.77	0.32	0.43	0.21	0.77	0.47	0.24	0.19
Control Delay	50.6	37.8	39.9	15.4	48.0	41.4	13.7	47.7	40.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	37.8	39.9	15.4	48.0	41.4	13.7	47.7	40.8	1.3
Queue Length 50th (ft)	39	150	221	87	49	25	0	58	30	0
Queue Length 95th (ft)	104	#304	#463	177	118	66	97	135	74	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	233	1026	803	2113	396	554	785	396	554	566
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.57	0.54	0.26	0.23	0.09	0.57	0.28	0.10	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	460	74	401	364	134	85	44	413	100	53	55
Future Volume (veh/h)	67	460	74	401	364	134	85	44	413	100	53	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	73	500	80	436	396	146	92	48	449	109	58	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	94	609	97	480	1059	386	130	471	399	147	489	414
Arrive On Green	0.05	0.20	0.20	0.27	0.42	0.42	0.07	0.25	0.25	0.08	0.26	0.26
Sat Flow, veh/h	1767	3046	485	1767	2531	922	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	73	288	292	436	274	268	92	48	449	109	58	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1768	1767	1763	1690	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.8	14.7	14.9	22.5	10.1	10.3	4.8	1.9	23.9	5.7	2.2	2.8
Cycle Q Clear(g_c), s	3.8	14.7	14.9	22.5	10.1	10.3	4.8	1.9	23.9	5.7	2.2	2.8
Prop In Lane	1.00		0.27	1.00		0.55	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	353	354	480	738	707	130	471	399	147	489	414
V/C Ratio(X)	0.78	0.82	0.82	0.91	0.37	0.38	0.71	0.10	1.13	0.74	0.12	0.14
Avail Cap(c_a), veh/h	199	442	443	685	926	888	338	471	399	338	489	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	36.0	36.1	33.1	18.9	18.9	42.6	26.9	35.1	42.2	26.4	26.6
Incr Delay (d2), s/veh	12.7	9.4	9.9	12.2	0.3	0.3	6.9	0.1	83.7	7.1	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	7.1	7.3	11.0	4.1	4.0	2.3	0.8	18.2	2.7	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.7	45.4	45.9	45.4	19.2	19.2	49.5	27.0	118.9	49.3	26.5	26.7
LnGrp LOS	E	D	D	D	B	B	D	C	F	D	C	C
Approach Vol, veh/h		653			978			589			227	
Approach Delay, s/veh		46.9			30.9			100.5			37.5	
Approach LOS		D			C			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	28.4	30.1	23.3	11.4	29.3	9.5	43.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	23.9	36.5	23.6	18.0	23.9	10.6	49.5
Max Q Clear Time (g_c+I1), s	7.7	25.9	24.5	16.9	6.8	4.8	5.8	12.3
Green Ext Time (p_c), s	0.2	0.0	1.1	2.0	0.1	0.4	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	52.5
HCM 6th LOS	D

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	503	26	946	76	549
v/c Ratio	0.57	0.07	0.65	0.30	0.27
Control Delay	25.7	10.3	16.2	33.2	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	10.3	16.2	33.2	6.6
Queue Length 50th (ft)	89	0	131	27	44
Queue Length 95th (ft)	176	20	250	81	88
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2015	854	2891	486	3406
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.25	0.03	0.33	0.16	0.16

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	460	27	568	303	70	505
Future Volume (veh/h)	460	27	568	303	70	505
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	500	29	617	329	76	549
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	756	336	958	511	118	2095
Arrive On Green	0.21	0.21	0.43	0.43	0.07	0.59
Sat Flow, veh/h	3534	1572	2314	1184	1767	3618
Grp Volume(v), veh/h	500	29	490	456	76	549
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1642	1767	1763
Q Serve(g_s), s	6.1	0.7	10.3	10.3	2.0	3.5
Cycle Q Clear(g_c), s	6.1	0.7	10.3	10.3	2.0	3.5
Prop In Lane	1.00	1.00		0.72	1.00	
Lane Grp Cap(c), veh/h	756	336	760	708	118	2095
V/C Ratio(X)	0.66	0.09	0.64	0.64	0.64	0.26
Avail Cap(c_a), veh/h	2527	1124	2163	2015	584	5830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	14.8	10.5	10.5	21.3	4.6
Incr Delay (d2), s/veh	1.0	0.1	0.9	1.0	5.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.2	3.3	3.0	0.9	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.9	14.9	11.4	11.5	27.0	4.6
LnGrp LOS	B	B	B	B	C	A
Approach Vol, veh/h	529		946			625
Approach Delay, s/veh	17.7		11.5			7.4
Approach LOS	B		B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.6	24.7				32.3		14.5
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	15.5	57.5				77.5		33.5
Max Q Clear Time (g_c+I1), s	4.0	12.3				5.5		8.1
Green Ext Time (p_c), s	0.1	7.9				4.3		2.0

Intersection Summary			
HCM 6th Ctrl Delay			11.8
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	229	105	431	426	192
v/c Ratio	0.50	0.06	0.53	0.48	0.38
Control Delay	20.3	5.5	9.2	17.0	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	5.5	9.2	17.0	5.8
Queue Length 50th (ft)	49	5	15	44	0
Queue Length 95th (ft)	128	16	57	101	45
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1481	3505	2143	2721	1195
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.03	0.20	0.16	0.16

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	211	97	122	274	319	249
Future Volume (veh/h)	211	97	122	274	319	249
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	229	105	133	298	408	206
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	308	1986	495	442	778	346
Arrive On Green	0.17	0.56	0.28	0.28	0.22	0.22
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	229	105	133	298	408	206
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	5.1	0.6	2.4	7.0	4.2	4.9
Cycle Q Clear(g_c), s	5.1	0.6	2.4	7.0	4.2	4.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	308	1986	495	442	778	346
V/C Ratio(X)	0.74	0.05	0.27	0.67	0.52	0.59
Avail Cap(c_a), veh/h	1679	6232	1251	1116	3187	1418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	4.1	11.6	13.3	14.3	14.5
Incr Delay (d2), s/veh	3.6	0.0	0.3	1.8	0.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.1	0.8	2.2	1.5	4.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.9	4.1	11.9	15.1	14.8	16.2
LnGrp LOS	B	A	B	B	B	B
Approach Vol, veh/h		334	431		614	
Approach Delay, s/veh		14.9	14.1		15.3	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				27.9		13.7	11.7	16.2
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				73.5		37.5	39.5	29.5
Max Q Clear Time (g_c+I1), s				2.6		6.9	7.1	9.0
Green Ext Time (p_c), s				0.7		2.3	0.7	2.7

Intersection Summary		
HCM 6th Ctrl Delay		14.8
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	11	359	5	19	335	138	22	251
v/c Ratio	0.22	0.04	0.64	0.02	0.08	0.59	0.07	0.09	0.37
Control Delay	24.9	22.1	9.2	28.2	20.4	20.2	7.5	27.0	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	22.1	9.2	28.2	20.4	20.2	7.5	27.0	16.8
Queue Length 50th (ft)	13	2	0	1	2	67	5	5	20
Queue Length 95th (ft)	62	18	68	13	23	216	38	32	75
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	442	1274	1194	211	962	1495	3304	288	1747
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.01	0.30	0.02	0.02	0.22	0.04	0.08	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	10	330	5	9	8	308	124	3	20	151	80
Future Volume (veh/h)	57	10	330	5	9	8	308	124	3	20	151	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	62	11	359	5	10	9	335	135	3	22	164	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	101	513	435	12	204	183	416	1208	27	46	303	153
Arrive On Green	0.06	0.28	0.28	0.01	0.23	0.23	0.24	0.34	0.34	0.03	0.13	0.13
Sat Flow, veh/h	1767	1856	1572	1767	900	810	1767	3526	78	1767	2267	1145
Grp Volume(v), veh/h	62	11	359	5	0	19	335	67	71	22	126	125
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1710	1767	1763	1841	1767	1763	1649
Q Serve(g_s), s	1.8	0.2	11.1	0.1	0.0	0.4	9.3	1.3	1.4	0.6	3.4	3.7
Cycle Q Clear(g_c), s	1.8	0.2	11.1	0.1	0.0	0.4	9.3	1.3	1.4	0.6	3.4	3.7
Prop In Lane	1.00		1.00	1.00		0.47	1.00		0.04	1.00		0.69
Lane Grp Cap(c), veh/h	101	513	435	12	0	387	416	604	631	46	235	220
V/C Ratio(X)	0.62	0.02	0.83	0.42	0.00	0.05	0.81	0.11	0.11	0.48	0.53	0.57
Avail Cap(c_a), veh/h	393	1130	958	188	0	843	1418	1960	2047	256	801	749
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	13.6	17.5	25.6	0.0	15.7	18.7	11.6	11.6	24.8	20.9	21.0
Incr Delay (d2), s/veh	6.0	0.0	4.0	22.1	0.0	0.1	3.7	0.1	0.1	7.4	1.9	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.1	4.0	0.1	0.0	0.2	3.7	0.5	0.5	0.3	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	13.6	21.6	47.7	0.0	15.7	22.4	11.7	11.7	32.2	22.8	23.3
LnGrp LOS	C	B	C	D	A	B	C	B	B	C	C	C
Approach Vol, veh/h		432			24			473			273	
Approach Delay, s/veh		22.6			22.4			19.3			23.8	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	22.2	4.8	18.8	16.7	11.4	7.4	16.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	57.5	5.5	31.5	41.5	23.5	11.5	25.5
Max Q Clear Time (g_c+I1), s	2.6	3.4	2.1	13.1	11.3	5.7	3.8	2.4
Green Ext Time (p_c), s	0.0	0.8	0.0	1.3	1.0	1.2	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay		21.5
HCM 6th LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	325	39	156	125	345	33	424
v/c Ratio	0.33	0.31	0.15	0.27	0.35	0.28	0.13	0.49
Control Delay	26.3	11.5	27.5	21.5	26.0	14.5	27.6	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	11.5	27.5	21.5	26.0	14.5	27.6	15.9
Queue Length 50th (ft)	33	18	12	19	37	32	10	42
Queue Length 95th (ft)	90	70	43	53	97	92	39	97
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	883	2137	453	1650	906	2880	414	2241
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.15	0.09	0.09	0.14	0.12	0.08	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	157	142	36	108	36	115	264	53	30	229	161
Future Volume (veh/h)	103	157	142	36	108	36	115	264	53	30	229	161
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	171	0	39	117	0	125	287	0	33	249	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	166	650		79	477		176	792		69	578	
Arrive On Green	0.09	0.18	0.00	0.04	0.14	0.00	0.10	0.22	0.00	0.04	0.16	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	112	171	0	39	117	0	125	287	0	33	249	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	2.2	1.5	0.0	0.8	1.1	0.0	2.4	2.4	0.0	0.6	2.3	0.0
Cycle Q Clear(g_c), s	2.2	1.5	0.0	0.8	1.1	0.0	2.4	2.4	0.0	0.6	2.3	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	166	650		79	477		176	792		69	578	
V/C Ratio(X)	0.67	0.26		0.49	0.25		0.71	0.36		0.48	0.43	
Avail Cap(c_a), veh/h	1120	3227		572	2135		1170	4716		523	3426	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.6	12.4	0.0	16.6	13.7	0.0	15.5	11.6	0.0	16.7	13.4	0.0
Incr Delay (d2), s/veh	4.7	0.2	0.0	4.6	0.3	0.0	5.2	0.3	0.0	5.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.5	0.0	0.4	0.3	0.0	1.0	0.7	0.0	0.3	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	12.6	0.0	21.2	14.0	0.0	20.7	11.9	0.0	21.7	13.9	0.0
LnGrp LOS	C	B		C	B		C	B		C	B	
Approach Vol, veh/h		283			156			412			282	
Approach Delay, s/veh		15.6			15.8			14.6			14.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	12.5	6.1	11.0	8.0	10.3	7.8	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	47.5	11.5	32.5	23.5	34.5	22.5	21.5
Max Q Clear Time (g_c+I1), s	2.6	4.4	2.8	3.5	4.4	4.3	4.2	3.1
Green Ext Time (p_c), s	0.0	1.9	0.0	1.0	0.3	1.6	0.2	0.5

Intersection Summary	
HCM 6th Ctrl Delay	15.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	387	191	221	138	200
v/c Ratio	0.46	0.45	0.11	0.37	0.41
Control Delay	15.1	19.5	4.6	20.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	19.5	4.6	20.0	6.3
Queue Length 50th (ft)	36	41	11	30	0
Queue Length 95th (ft)	83	105	25	83	43
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	2474	1436	3505	1466	1344
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.13	0.06	0.09	0.15

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	116	176	203	127	184
Future Volume (veh/h)	240	116	176	203	127	184
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	261	126	191	221	138	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	542	254	263	1835	357	317
Arrive On Green	0.23	0.23	0.15	0.52	0.20	0.20
Sat Flow, veh/h	2423	1092	1767	3618	1767	1572
Grp Volume(v), veh/h	196	191	191	221	138	200
Grp Sat Flow(s),veh/h/ln	1763	1659	1767	1763	1767	1572
Q Serve(g_s), s	3.1	3.2	3.3	1.0	2.2	3.8
Cycle Q Clear(g_c), s	3.1	3.2	3.3	1.0	2.2	3.8
Prop In Lane		0.66	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	410	386	263	1835	357	317
V/C Ratio(X)	0.48	0.50	0.73	0.12	0.39	0.63
Avail Cap(c_a), veh/h	1769	1664	1991	7999	2046	1820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.7	10.8	13.2	4.0	11.2	11.8
Incr Delay (d2), s/veh	0.9	1.0	3.8	0.0	0.7	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.9	1.2	0.1	0.7	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.6	11.8	17.0	4.0	11.9	13.9
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	387			412	338	
Approach Delay, s/veh	11.7			10.0	13.1	
Approach LOS	B			B	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		11.0	9.3	12.0				21.4
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		37.5	36.5	32.5				73.5
Max Q Clear Time (g_c+I1), s		5.8	5.3	5.2				3.0
Green Ext Time (p_c), s		1.1	0.5	2.3				1.5

Intersection Summary			
HCM 6th Ctrl Delay			11.5
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	23	805	58	361	251	98	7
v/c Ratio	0.11	0.60	0.23	0.23	0.57	0.14	0.01
Control Delay	33.8	17.6	31.9	12.4	25.6	0.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	17.6	31.9	12.4	25.6	0.4	0.0
Queue Length 50th (ft)	8	118	19	30	78	0	0
Queue Length 95th (ft)	36	240	67	100	190	0	0
Internal Link Dist (ft)		424		851		1161	269
Turn Bay Length (ft)	125		125		75		
Base Capacity (vph)	296	2698	435	2912	1096	1298	1338
Starvation Cap Reductn	0	1	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.30	0.13	0.12	0.23	0.08	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	554	187	53	331	1	231	0	90	0	0	6
Future Volume (veh/h)	21	554	187	53	331	1	231	0	90	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	23	602	203	58	360	1	251	0	98	0	0	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	49	971	327	103	1462	4	510	0	387	171	0	387
Arrive On Green	0.03	0.37	0.37	0.06	0.41	0.41	0.25	0.00	0.25	0.00	0.00	0.25
Sat Flow, veh/h	1767	2590	872	1767	3606	10	1397	0	1572	1287	0	1572
Grp Volume(v), veh/h	23	409	396	58	176	185	251	0	98	0	0	7
Grp Sat Flow(s),veh/h/ln	1767	1763	1699	1767	1763	1854	1397	0	1572	1287	0	1572
Q Serve(g_s), s	0.5	8.0	8.0	1.3	2.8	2.8	7.0	0.0	2.1	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.5	8.0	8.0	1.3	2.8	2.8	7.1	0.0	2.1	0.0	0.0	0.1
Prop In Lane	1.00		0.51	1.00		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	49	661	637	103	715	751	510	0	387	171	0	387
V/C Ratio(X)	0.46	0.62	0.62	0.56	0.25	0.25	0.49	0.00	0.25	0.00	0.00	0.02
Avail Cap(c_a), veh/h	357	1989	1917	525	2157	2268	1710	0	1737	1276	0	1737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	20.1	10.7	10.7	19.3	8.3	8.3	14.7	0.0	12.8	0.0	0.0	12.0
Incr Delay (d2), s/veh	6.6	1.0	1.0	4.7	0.2	0.2	0.7	0.0	0.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.4	2.4	0.6	0.8	0.8	1.9	0.0	0.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	11.7	11.7	24.0	8.4	8.4	15.5	0.0	13.1	0.0	0.0	12.0
LnGrp LOS	C	B	B	C	A	A	B	A	B	A	A	B
Approach Vol, veh/h		828			419			349			7	
Approach Delay, s/veh		12.1			10.6			14.8			12.0	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.9	7.0	20.3		14.9	5.7	21.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		46.5	12.5	47.5		46.5	8.5	51.5				
Max Q Clear Time (g_c+I1), s		9.1	3.3	10.0		2.1	2.5	4.8				
Green Ext Time (p_c), s		1.4	0.1	5.8		0.0	0.0	2.2				
Intersection Summary												
HCM 6th Ctrl Delay			12.3									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	642	452	656	383	125	240	1167
v/c Ratio	0.78	0.25	0.79	0.64	0.34	0.41	0.81
Control Delay	43.7	14.6	36.7	44.4	10.2	39.3	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.7	14.6	36.7	44.4	10.2	39.3	7.5
Queue Length 50th (ft)	192	76	161	118	0	71	0
Queue Length 95th (ft)	#317	143	278	198	53	117	58
Internal Link Dist (ft)		852	424	1178			
Turn Bay Length (ft)	275				450	100	300
Base Capacity (vph)	1010	2177	1004	814	460	1010	1640
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.21	0.65	0.47	0.27	0.24	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	591	416	0	0	352	251	0	352	115	221	0	1074
Future Volume (veh/h)	591	416	0	0	352	251	0	352	115	221	0	1074
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	0	1856	1856	1856	0	1856
Adj Flow Rate, veh/h	642	452	0	0	383	273	0	383	125	240	0	1167
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	3	3	0	3
Cap, veh/h	798	1926	0	0	497	350	0	571	255	360	0	0
Arrive On Green	0.23	0.55	0.00	0.00	0.25	0.25	0.00	0.16	0.16	0.10	0.00	0.00
Sat Flow, veh/h	3428	3618	0	0	2070	1391	0	3618	1572	3428	240	
Grp Volume(v), veh/h	642	452	0	0	341	315	0	383	125	240	33.3	
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1763	1605	0	1763	1572	1714	C	
Q Serve(g_s), s	12.8	4.8	0.0	0.0	13.0	13.2	0.0	7.4	5.2	4.9		
Cycle Q Clear(g_c), s	12.8	4.8	0.0	0.0	13.0	13.2	0.0	7.4	5.2	4.9		
Prop In Lane	1.00		0.00	0.00		0.87	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	798	1926	0	0	443	403	0	571	255	360		
V/C Ratio(X)	0.80	0.23	0.00	0.00	0.77	0.78	0.00	0.67	0.49	0.67		
Avail Cap(c_a), veh/h	1305	2807	0	0	622	567	0	1049	468	1305		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	26.2	8.5	0.0	0.0	25.1	25.2	0.0	28.5	27.6	31.1		
Incr Delay (d2), s/veh	2.0	0.1	0.0	0.0	3.8	4.6	0.0	1.4	1.5	2.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.1	1.6	0.0	0.0	5.5	5.2	0.0	3.1	2.0	2.1		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	8.6	0.0	0.0	28.9	29.8	0.0	29.8	29.0	33.3		
LnGrp LOS	C	A	A	A	C	C	A	C	C	C		
Approach Vol, veh/h		1094			656			508				
Approach Delay, s/veh		20.1			29.3			29.6				
Approach LOS		C			C			C				

Timer - Assigned Phs	1	2		4			7	8				
Phs Duration (G+Y+Rc), s	12.1	16.2		44.0			21.3	22.6				
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s	27.5	21.5		57.5			27.5	25.5				
Max Q Clear Time (g_c+I1), s	6.9	9.4		6.8			14.8	15.2				
Green Ext Time (p_c), s	0.8	2.3		3.3			2.0	2.9				

Intersection Summary			
HCM 6th Ctrl Delay			25.7
HCM 6th LOS			C

Lane Group	EBL	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL	SWR
Lane Group Flow (vph)	89	773	552	504	1054	163	149	95	159	242
v/c Ratio	0.50	0.70	0.67	0.74	0.69	0.64	0.56	0.28	0.62	0.70
Control Delay	57.4	34.6	9.2	46.3	27.0	55.5	51.3	4.6	53.8	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	34.6	9.2	46.3	27.0	55.5	51.3	4.6	53.8	31.4
Queue Length 50th (ft)	56	228	28	160	295	102	92	0	99	65
Queue Length 95th (ft)	122	345	149	250	436	193	177	20	186	166
Internal Link Dist (ft)		693			852		265		1072	
Turn Bay Length (ft)	150		200	285		125		125		
Base Capacity (vph)	230	1430	929	882	1825	343	361	416	380	447
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.54	0.59	0.57	0.58	0.48	0.41	0.23	0.42	0.54

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	82	711	508	464	779	190	150	137	87	146	0	202
Future Volume (vph)	82	711	508	464	779	190	150	137	87	146	0	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	1568	3400	3402		1752	1845	1568		1752	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	1568	3400	3402		1752	1845	1568		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	89	773	552	504	847	207	163	149	95	159	0	220
RTOR Reduction (vph)	0	0	329	0	0	0	0	0	81	0	0	116
Lane Group Flow (vph)	89	773	223	504	1054	0	163	149	14	0	159	126
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Prot	Prot	Prot	Prot
Protected Phases	5	2		1	6		4	4	4	8	8	8
Permitted Phases			2									
Actuated Green, G (s)	8.2	32.6	32.6	19.8	44.2		14.3	14.3	14.3		14.5	14.5
Effective Green, g (s)	8.2	32.6	32.6	19.8	44.2		14.3	14.3	14.3		14.5	14.5
Actuated g/C Ratio	0.08	0.33	0.33	0.20	0.45		0.14	0.14	0.14		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	144	1151	515	678	1515		252	265	226		256	229
v/s Ratio Prot	0.05	0.22		c0.15	c0.31		c0.09	0.08	0.01		c0.09	0.08
v/s Ratio Perm			0.14									
v/c Ratio	0.62	0.67	0.43	0.74	0.70		0.65	0.56	0.06		0.62	0.55
Uniform Delay, d1	44.0	28.7	26.1	37.3	22.1		40.1	39.5	36.7		39.8	39.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.7	1.6	0.6	4.4	1.4		5.6	2.7	0.1		4.6	2.7
Delay (s)	51.7	30.2	26.7	41.7	23.5		45.7	42.3	36.8		44.4	42.0
Level of Service	D	C	C	D	C		D	D	D		D	D
Approach Delay (s)		30.2			29.4			42.3			43.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	99.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	95	284	409	32	65	398
v/c Ratio	0.23	0.48	0.38	0.06	0.17	0.24
Control Delay	15.4	5.9	12.4	5.9	15.8	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	5.9	12.4	5.9	15.8	5.1
Queue Length 50th (ft)	17	0	37	0	12	17
Queue Length 95th (ft)	52	46	76	14	40	37
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1720	1544	3317	1485	1301	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.18	0.12	0.02	0.05	0.11

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	87	261	376	29	60	366		
Future Volume (veh/h)	87	261	376	29	60	366		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No		No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	95	284	409	32	65	398		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	442	393	825	368	245	1757		
Arrive On Green	0.25	0.25	0.23	0.23	0.14	0.50		
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618		
Grp Volume(v), veh/h	95	284	409	32	65	398		
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763		
Q Serve(g_s), s	1.5	5.9	3.6	0.6	1.2	2.3		
Cycle Q Clear(g_c), s	1.5	5.9	3.6	0.6	1.2	2.3		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	442	393	825	368	245	1757		
V/C Ratio(X)	0.22	0.72	0.50	0.09	0.27	0.23		
Avail Cap(c_a), veh/h	2150	1913	3796	1693	1211	6655		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	10.6	12.3	11.9	10.7	13.8	5.1		
Incr Delay (d2), s/veh	0.2	2.5	0.5	0.1	0.6	0.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.4	1.7	1.0	0.1	0.4	0.4		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	10.9	14.8	12.3	10.8	14.4	5.1		
LnGrp LOS	B	B	B	B	B	A		
Approach Vol, veh/h	379		441			463		
Approach Delay, s/veh	13.8		12.2			6.4		
Approach LOS	B		B			A		
Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.4	12.9				22.3		13.4
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	24.5	38.5				67.5		43.5
Max Q Clear Time (g_c+I1), s	3.2	5.6				4.3		7.9
Green Ext Time (p_c), s	0.1	2.8				2.7		1.2
Intersection Summary								
HCM 6th Ctrl Delay			10.6					
HCM 6th LOS			B					

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	83	190	103	110	155	73	897	154	112	402
v/c Ratio	0.42	0.60	0.47	0.33	0.38	0.39	0.71	0.56	0.13	0.43
Control Delay	50.5	45.3	50.2	39.1	9.4	50.7	28.6	48.3	19.0	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	45.3	50.2	39.1	9.4	50.7	28.6	48.3	19.0	3.6
Queue Length 50th (ft)	45	97	55	55	0	39	223	82	39	0
Queue Length 95th (ft)	115	208	134	127	56	104	370	182	87	56
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	275	510	317	562	585	251	1951	426	1202	1161
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.37	0.32	0.20	0.26	0.29	0.46	0.36	0.09	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	145	29	95	101	143	67	680	145	142	103	370
Future Volume (veh/h)	76	145	29	95	101	143	67	680	145	142	103	370
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	83	158	32	103	110	155	73	739	158	154	112	402
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	110	221	45	135	300	254	103	1051	225	201	777	659
Arrive On Green	0.06	0.15	0.15	0.08	0.16	0.16	0.06	0.36	0.36	0.11	0.42	0.42
Sat Flow, veh/h	1767	1498	303	1767	1856	1572	1767	2889	618	1767	1856	1572
Grp Volume(v), veh/h	83	0	190	103	110	155	73	451	446	154	112	402
Grp Sat Flow(s),veh/h/ln	1767	0	1801	1767	1856	1572	1767	1763	1744	1767	1856	1572
Q Serve(g_s), s	2.8	0.0	6.1	3.4	3.2	5.5	2.4	13.2	13.2	5.1	2.2	12.0
Cycle Q Clear(g_c), s	2.8	0.0	6.1	3.4	3.2	5.5	2.4	13.2	13.2	5.1	2.2	12.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	110	0	266	135	300	254	103	641	635	201	777	659
V/C Ratio(X)	0.75	0.00	0.71	0.77	0.37	0.61	0.71	0.70	0.70	0.77	0.14	0.61
Avail Cap(c_a), veh/h	370	0	673	425	752	637	337	1331	1317	572	1648	1396
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.8	0.0	24.5	27.3	22.5	23.5	27.8	16.4	16.4	25.9	10.8	13.7
Incr Delay (d2), s/veh	9.9	0.0	3.6	8.7	0.7	2.4	8.5	1.4	1.4	6.1	0.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	2.7	1.7	1.4	2.1	1.2	5.0	4.9	2.4	0.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	0.0	28.0	36.0	23.3	25.9	36.3	17.8	17.8	32.0	10.9	14.6
LnGrp LOS	D	A	C	D	C	C	D	B	B	C	B	B
Approach Vol, veh/h		273			368			970			668	
Approach Delay, s/veh		31.0			27.9			19.2			18.0	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.3	26.4	9.1	13.4	8.0	29.7	8.3	14.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	19.5	45.5	14.5	22.5	11.5	53.5	12.6	24.4				
Max Q Clear Time (g_c+I1), s	7.1	15.2	5.4	8.1	4.4	14.0	4.8	7.5				
Green Ext Time (p_c), s	0.3	6.7	0.1	0.8	0.1	2.2	0.1	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			21.7									
HCM 6th LOS			C									

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	359	917	960	87	1373	268
v/c Ratio	0.28	0.79	0.53	0.10	0.76	0.17
Control Delay	22.1	27.3	17.3	3.6	22.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	27.3	17.3	3.6	22.5	0.2
Queue Length 50th (ft)	71	211	182	0	311	0
Queue Length 95th (ft)	147	422	347	27	580	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	2208	1854	2812	1275	2812	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.49	0.34	0.07	0.49	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	330	0	844	0	883	80	0	1263	247
Future Volume (veh/h)	0	0	0	330	0	844	0	883	80	0	1263	247
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				359	0	917	0	960	87	0	1373	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1348	0	1088	0	1768	789	0	1768	
Arrive On Green				0.39	0.00	0.39	0.00	0.50	0.50	0.00	0.50	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				359	0	917	0	960	87	0	1373	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				6.1	0.0	25.7	0.0	15.9	2.5	0.0	27.2	0.0
Cycle Q Clear(g_c), s				6.1	0.0	25.7	0.0	15.9	2.5	0.0	27.2	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1348	0	1088	0	1768	789	0	1768	
V/C Ratio(X)				0.27	0.00	0.84	0.00	0.54	0.11	0.00	0.78	
Avail Cap(c_a), veh/h				2267	0	1830	0	3073	1371	0	3073	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.6	0.0	23.5	0.0	14.6	11.2	0.0	17.4	0.0
Incr Delay (d2), s/veh				0.1	0.0	1.9	0.0	0.3	0.1	0.0	0.8	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.2	0.0	7.9	0.0	5.7	0.8	0.0	9.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				17.7	0.0	25.4	0.0	14.9	11.3	0.0	18.1	0.0
LnGrp LOS				B	A	C	A	B	B	A	B	
Approach Vol, veh/h					1276			1047			1373	
Approach Delay, s/veh					23.2			14.6			18.1	
Approach LOS					C			B			B	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		47.4				47.4		38.1				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		74.5				74.5		56.5				
Max Q Clear Time (g_c+I1), s		17.9				29.2		27.7				
Green Ext Time (p_c), s		8.4				13.7		5.9				

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBR
Lane Group Flow (vph)	11	737	583	97	820	327	79	2
v/c Ratio	0.05	0.57	0.37	0.31	0.30	0.43	0.10	0.01
Control Delay	31.1	17.7	0.7	27.9	8.3	23.6	0.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	17.7	0.7	27.9	8.3	23.6	0.3	0.0
Queue Length 50th (ft)	3	95	0	27	36	46	0	0
Queue Length 95th (ft)	22	226	0	93	134	122	0	0
Internal Link Dist (ft)		1084			414		644	
Turn Bay Length (ft)	230			215		425		
Base Capacity (vph)	232	2746	1568	589	4515	1558	1046	762
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.27	0.37	0.16	0.18	0.21	0.08	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	678	536	89	754	0	301	0	73	0	0	2
Future Volume (veh/h)	10	678	536	89	754	0	301	0	73	0	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	737	0	97	820	0	327	0	0	0	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	25	1212		141	2073	0	536	489		4	5	4
Arrive On Green	0.01	0.34	0.00	0.08	0.41	0.00	0.16	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1767	3526	1572	1767	5233	0	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	11	737	0	97	820	0	327	0	0	0	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	0	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	0.3	7.5	0.0	2.3	4.9	0.0	3.8	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.3	7.5	0.0	2.3	4.9	0.0	3.8	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	25	1212		141	2073	0	536	489		4	5	4
V/C Ratio(X)	0.43	0.61		0.69	0.40	0.00	0.61	0.00		0.00	0.00	0.46
Avail Cap(c_a), veh/h	266	3475		676	6168	0	1789	1076		738	882	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	11.7	0.0	19.3	9.0	0.0	17.0	0.0	0.0	0.0	0.0	21.5
Incr Delay (d2), s/veh	11.3	0.5	0.0	5.9	0.1	0.0	1.1	0.0	0.0	0.0	0.0	61.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.2	0.0	1.0	1.2	0.0	1.4	0.0	0.0	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.4	12.2	0.0	25.2	9.1	0.0	18.1	0.0	0.0	0.0	0.0	83.4
LnGrp LOS	C	B		C	A	A	B	A		A	A	F
Approach Vol, veh/h		748			917			327			2	
Approach Delay, s/veh		12.5			10.8			18.1			83.4	
Approach LOS		B			B			B			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	15.9	7.9	19.3	11.2	4.6	5.1	22.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	25.0	16.5	42.5	22.5	20.5	6.5	52.5
Max Q Clear Time (g_c+I1), s	0.0	0.0	4.3	9.5	5.8	2.1	2.3	6.9
Green Ext Time (p_c), s	0.0	0.0	0.2	5.3	1.0	0.0	0.0	6.3

Intersection Summary	
HCM 6th Ctrl Delay	12.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	24	483	293	20	626	265	8	2	4
v/c Ratio	0.07	0.35	0.37	0.06	0.45	0.29	0.01	0.01	0.01
Control Delay	20.0	10.2	3.5	20.2	11.1	14.9	0.0	22.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	10.2	3.5	20.2	11.1	14.9	0.0	22.0	0.0
Queue Length 50th (ft)	3	25	0	3	34	18	0	0	0
Queue Length 95th (ft)	30	117	46	26	156	81	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	553	3281	1487	553	3281	2505	1467	395	1074
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.15	0.20	0.04	0.19	0.11	0.01	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	444	270	18	575	1	244	0	7	2	0	4
Future Volume (veh/h)	22	444	270	18	575	1	244	0	7	2	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	483	0	20	625	1	265	0	8	2	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	52	1103		45	1114	2	483	290	246	5	0	29
Arrive On Green	0.03	0.31	0.00	0.03	0.31	0.31	0.14	0.00	0.16	0.00	0.00	0.02
Sat Flow, veh/h	1767	3526	1572	1767	3611	6	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	24	483	0	20	305	321	265	0	8	2	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1855	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	0.5	3.9	0.0	0.4	5.2	5.2	2.6	0.0	0.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.5	3.9	0.0	0.4	5.2	5.2	2.6	0.0	0.2	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	52	1103		45	544	572	483	290	246	5	0	29
V/C Ratio(X)	0.46	0.44		0.45	0.56	0.56	0.55	0.00	0.03	0.41	0.00	0.14
Avail Cap(c_a), veh/h	518	4579		518	2290	2409	2346	1944	1647	370	0	900
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	9.8	0.0	17.2	10.4	10.4	14.3	0.0	12.8	17.8	0.0	17.3
Incr Delay (d2), s/veh	6.1	0.3	0.0	6.9	0.9	0.9	1.0	0.0	0.1	45.8	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.0	0.0	0.2	1.4	1.5	0.9	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	10.1	0.0	24.1	11.3	11.2	15.3	0.0	12.9	63.6	0.0	19.5
LnGrp LOS	C	B		C	B	B	B	A	B	E	A	B
Approach Vol, veh/h		507			646			273			6	
Approach Delay, s/veh		10.7			11.6			15.2			34.2	
Approach LOS		B			B			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.6	10.1	5.4	15.7	9.5	5.1	5.6	15.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	37.5	10.5	46.5	24.5	20.5	10.5	46.5				
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.4	5.9	4.6	2.1	2.5	7.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	3.3	0.9	0.0	0.0	3.9				
Intersection Summary												
HCM 6th Ctrl Delay			12.1									
HCM 6th LOS			B									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	370	88	11	370	257	55
v/c Ratio	0.32	0.15	0.03	0.28	0.26	0.11
Control Delay	9.1	3.9	12.8	6.4	10.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	3.9	12.8	6.4	10.0	5.0
Queue Length 50th (ft)	15	0	1	15	11	0
Queue Length 95th (ft)	64	22	12	35	49	19
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1343	3505	3350	1546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.06	0.01	0.11	0.08	0.04

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	340	81	10	340	236	51
Future Volume (veh/h)	340	81	10	340	236	51
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	370	88	11	370	257	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	858	383	278	1933	538	247
Arrive On Green	0.24	0.24	0.16	0.55	0.16	0.16
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	370	88	11	370	257	55
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	2.7	1.4	0.2	1.6	2.1	0.9
Cycle Q Clear(g_c), s	2.7	1.4	0.2	1.6	2.1	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	858	383	278	1933	538	247
V/C Ratio(X)	0.43	0.23	0.04	0.19	0.48	0.22
Avail Cap(c_a), veh/h	5256	2344	1187	8144	4550	2087
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	9.3	10.9	3.5	11.7	11.2
Incr Delay (d2), s/veh	0.3	0.3	0.1	0.0	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.3	0.0	0.1	0.6	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.1	9.6	11.0	3.5	12.4	11.7
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	458			381	312	
Approach Delay, s/veh	10.0			3.7	12.3	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.3	9.3	11.9				21.2
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		40.5	20.5	45.5				70.5
Max Q Clear Time (g_c+I1), s		4.1	2.2	4.7				3.6
Green Ext Time (p_c), s		1.1	0.0	2.7				2.5

Intersection Summary		
HCM 6th Ctrl Delay		8.5
HCM 6th LOS		A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	296	68	507	16	2	25	71	26
v/c Ratio	0.05	0.15	0.12	0.21	0.01	0.00	0.05	0.11	0.05
Control Delay	16.2	10.3	14.5	6.2	0.5	14.0	8.3	13.6	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	10.3	14.5	6.2	0.5	14.0	8.3	13.6	7.7
Queue Length 50th (ft)	4	26	12	23	0	0	1	12	0
Queue Length 95th (ft)	22	56	42	87	2	4	15	42	15
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	1123	3472	1327	3505	1568	1694	1471	1694	1452
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.09	0.05	0.14	0.01	0.00	0.02	0.04	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	268	5	63	466	15	2	3	20	65	1	23
Future Volume (veh/h)	22	268	5	63	466	15	2	3	20	65	1	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	291	5	68	507	16	2	3	22	71	1	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1045	18	132	1194	533	411	22	160	413	7	173
Arrive On Green	0.03	0.29	0.29	0.07	0.34	0.34	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3547	61	1767	3526	1572	1374	192	1410	1375	61	1521
Grp Volume(v), veh/h	24	144	152	68	507	16	2	0	25	71	0	26
Grp Sat Flow(s),veh/h/ln	1767	1763	1845	1767	1763	1572	1374	0	1602	1375	0	1582
Q Serve(g_s), s	0.3	1.6	1.6	1.0	2.9	0.2	0.0	0.0	0.4	1.3	0.0	0.4
Cycle Q Clear(g_c), s	0.3	1.6	1.6	1.0	2.9	0.2	0.4	0.0	0.4	1.6	0.0	0.4
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	54	520	544	132	1194	533	411	0	182	413	0	180
V/C Ratio(X)	0.44	0.28	0.28	0.52	0.42	0.03	0.00	0.00	0.14	0.17	0.00	0.14
Avail Cap(c_a), veh/h	1117	3140	3286	1658	7360	3283	2123	0	2178	2126	0	2151
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.4	7.1	7.1	11.6	6.7	5.8	10.6	0.0	10.4	11.2	0.0	10.4
Incr Delay (d2), s/veh	5.6	0.3	0.3	3.1	0.2	0.0	0.0	0.0	0.3	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.4	0.4	0.6	0.0	0.0	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	7.4	7.4	14.7	6.9	5.8	10.6	0.0	10.8	11.4	0.0	10.8
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		320			591			27			97	
Approach Delay, s/veh		8.2			7.8			10.7			11.2	
Approach LOS		A			A			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.5	6.4	12.2		7.5	5.3	13.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		35.5	24.5	46.5		35.5	16.5	54.5				
Max Q Clear Time (g_c+I1), s		2.4	3.0	3.6		3.6	2.3	4.9				
Green Ext Time (p_c), s		0.1	0.1	1.8		0.3	0.0	4.0				
Intersection Summary												
HCM 6th Ctrl Delay			8.3									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	188	207	320	28	23	109	58	14	20
v/c Ratio	0.16	0.28	0.44	0.18	0.10	0.08	0.31	0.19	0.04	0.05
Control Delay	23.5	19.0	20.7	9.9	24.0	24.1	6.5	23.2	21.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	19.0	20.7	9.9	24.0	24.1	6.5	23.2	21.1	0.2
Queue Length 50th (ft)	13	23	55	20	8	6	0	16	3	0
Queue Length 95th (ft)	43	56	122	66	31	27	29	50	19	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	547	1837	1293	2843	854	1124	1009	941	1184	1055
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.16	0.11	0.03	0.02	0.11	0.06	0.01	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	42	138	35	190	196	98	26	21	100	53	13	18
Future Volume (veh/h)	42	138	35	190	196	98	26	21	100	53	13	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	150	38	207	213	107	28	23	109	58	14	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	89	367	90	282	552	267	209	265	225	167	221	187
Arrive On Green	0.05	0.13	0.13	0.16	0.24	0.24	0.12	0.14	0.14	0.09	0.12	0.12
Sat Flow, veh/h	1767	2803	691	1767	2304	1114	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	46	93	95	207	161	159	28	23	109	58	14	20
Grp Sat Flow(s),veh/h/ln	1767	1763	1731	1767	1763	1655	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	1.0	1.8	1.9	4.2	2.9	3.1	0.5	0.4	2.4	1.2	0.3	0.4
Cycle Q Clear(g_c), s	1.0	1.8	1.9	4.2	2.9	3.1	0.5	0.4	2.4	1.2	0.3	0.4
Prop In Lane	1.00		0.40	1.00		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	89	231	227	282	423	397	209	265	225	167	221	187
V/C Ratio(X)	0.51	0.40	0.42	0.73	0.38	0.40	0.13	0.09	0.49	0.35	0.06	0.11
Avail Cap(c_a), veh/h	580	995	977	1554	1967	1846	905	1242	1053	997	1340	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	15.2	15.2	15.2	12.1	12.2	15.0	14.2	15.0	16.2	14.9	15.0
Incr Delay (d2), s/veh	4.5	1.1	1.2	3.7	0.6	0.7	0.3	0.1	1.6	1.2	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.7	0.7	1.7	1.0	1.0	0.2	0.2	0.8	0.5	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	16.3	16.5	19.0	12.7	12.8	15.3	14.3	16.7	17.4	15.0	15.2
LnGrp LOS	C	B	B	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		234			527			160			92	
Approach Delay, s/veh		17.5			15.2			16.1			16.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	9.9	10.6	9.5	9.0	9.0	6.4	13.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	25.5	33.5	21.5	19.5	27.5	12.5	42.5
Max Q Clear Time (g_c+I1), s	3.2	4.4	6.2	3.9	2.5	2.4	3.0	5.1
Green Ext Time (p_c), s	0.1	0.4	0.6	0.9	0.0	0.1	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	16.0
HCM 6th LOS	B

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	147	15	450	47	217
v/c Ratio	0.15	0.04	0.28	0.10	0.11
Control Delay	12.5	8.5	7.9	13.8	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	8.5	7.9	13.8	4.4
Queue Length 50th (ft)	6	0	14	5	8
Queue Length 95th (ft)	34	12	65	30	18
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2994	1257	3330	1355	3505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.14	0.03	0.06

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	133	16	277	137	43	200
Future Volume (veh/h)	133	16	277	137	43	200
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	145	17	301	149	47	217
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	466	207	691	334	98	1855
Arrive On Green	0.13	0.13	0.30	0.30	0.06	0.53
Sat Flow, veh/h	3534	1572	2397	1113	1767	3618
Grp Volume(v), veh/h	145	17	229	221	47	217
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1655	1767	1763
Q Serve(g_s), s	1.0	0.2	2.7	2.8	0.7	0.8
Cycle Q Clear(g_c), s	1.0	0.2	2.7	2.8	0.7	0.8
Prop In Lane	1.00	1.00		0.67	1.00	
Lane Grp Cap(c), veh/h	466	207	528	496	98	1855
V/C Ratio(X)	0.31	0.08	0.43	0.45	0.48	0.12
Avail Cap(c_a), veh/h	3963	1763	3651	3428	1511	10921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.3	10.0	7.4	7.4	12.1	3.1
Incr Delay (d2), s/veh	0.4	0.2	0.6	0.6	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.7	0.7	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.7	10.2	8.0	8.1	15.7	3.2
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	162		450			264
Approach Delay, s/veh	10.7		8.0			5.4
Approach LOS	B		A			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	6.0	12.4	18.3	8.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	22.5	54.5	81.5	29.5
Max Q Clear Time (g_c+I1), s	2.7	4.8	2.8	3.0
Green Ext Time (p_c), s	0.1	3.1	1.6	0.5

Intersection Summary	
HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	142	48	250	112	51
v/c Ratio	0.29	0.03	0.30	0.15	0.14
Control Delay	13.5	3.6	6.4	11.6	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	3.6	6.4	11.6	6.6
Queue Length 50th (ft)	22	1	6	7	0
Queue Length 95th (ft)	58	5	28	23	20
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1749	3505	2962	3156	1349
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	0.08	0.04	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	131	44	74	156	84	66
Future Volume (veh/h)	131	44	74	156	84	66
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	142	48	80	170	107	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	220	1801	368	328	473	210
Arrive On Green	0.12	0.51	0.21	0.21	0.13	0.13
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	142	48	80	170	107	54
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	1.9	0.2	1.0	2.4	0.7	0.8
Cycle Q Clear(g_c), s	1.9	0.2	1.0	2.4	0.7	0.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	220	1801	368	328	473	210
V/C Ratio(X)	0.64	0.03	0.22	0.52	0.23	0.26
Avail Cap(c_a), veh/h	2825	10924	2331	2079	4534	2017
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.6	3.1	8.3	8.9	9.8	9.8
Incr Delay (d2), s/veh	3.1	0.0	0.3	1.3	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.3	0.6	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.7	3.1	8.6	10.2	10.0	10.5
LnGrp LOS	B	A	A	B	B	B
Approach Vol, veh/h		190	250		161	
Approach Delay, s/veh		11.0	9.7		10.2	
Approach LOS		B	A		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				17.4		7.9	7.7	9.8
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				78.5		32.5	40.5	33.5
Max Q Clear Time (g_c+I1), s				2.2		2.8	3.9	4.4
Green Ext Time (p_c), s				0.3		0.5	0.4	1.6

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	7	116	3	28	198	228	9	307
v/c Ratio	0.09	0.02	0.31	0.01	0.10	0.40	0.10	0.03	0.35
Control Delay	21.3	20.5	6.8	22.7	14.0	17.7	6.6	22.0	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	20.5	6.8	22.7	14.0	17.7	6.6	22.0	16.0
Queue Length 50th (ft)	5	1	0	1	1	36	7	2	28
Queue Length 95th (ft)	29	13	32	8	23	118	51	15	85
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	536	1218	1082	349	944	1499	3454	396	2701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.11	0.01	0.03	0.13	0.07	0.02	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	24	6	107	3	6	19	182	206	4	8	240	42
Future Volume (veh/h)	24	6	107	3	6	19	182	206	4	8	240	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	26	7	116	3	7	21	198	224	4	9	261	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	258	219	7	45	136	272	1160	21	21	557	97
Arrive On Green	0.03	0.14	0.14	0.00	0.11	0.11	0.15	0.33	0.33	0.01	0.19	0.19
Sat Flow, veh/h	1767	1856	1572	1767	409	1226	1767	3544	63	1767	3003	522
Grp Volume(v), veh/h	26	7	116	3	0	28	198	111	117	9	152	155
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1635	1767	1763	1844	1767	1763	1762
Q Serve(g_s), s	0.5	0.1	2.4	0.1	0.0	0.5	3.7	1.6	1.6	0.2	2.7	2.7
Cycle Q Clear(g_c), s	0.5	0.1	2.4	0.1	0.0	0.5	3.7	1.6	1.6	0.2	2.7	2.7
Prop In Lane	1.00		1.00	1.00		0.75	1.00		0.03	1.00		0.30
Lane Grp Cap(c), veh/h	56	258	219	7	0	182	272	577	604	21	327	327
V/C Ratio(X)	0.46	0.03	0.53	0.41	0.00	0.15	0.73	0.19	0.19	0.43	0.46	0.47
Avail Cap(c_a), veh/h	584	1360	1153	381	0	1010	1854	3066	3208	432	1647	1646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.5	12.9	13.9	17.3	0.0	14.0	14.0	8.4	8.4	17.1	12.6	12.7
Incr Delay (d2), s/veh	5.8	0.0	2.0	33.5	0.0	0.4	3.7	0.2	0.2	13.0	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.8	0.1	0.0	0.2	1.4	0.4	0.4	0.1	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	13.0	15.9	50.8	0.0	14.4	17.8	8.6	8.6	30.0	13.6	13.7
LnGrp LOS	C	B	B	D	A	B	B	A	A	C	B	B
Approach Vol, veh/h		149			31			426			316	
Approach Delay, s/veh		16.9			17.9			12.8			14.1	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.9	15.9	4.6	9.3	9.8	11.0	5.6	8.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	60.5	7.5	25.5	36.5	32.5	11.5	21.5				
Max Q Clear Time (g_c+I1), s	2.2	3.6	2.1	4.4	5.7	4.7	2.5	2.5				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.3	0.6	1.8	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			14.1									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	723	120	269	422	297	165	272
v/c Ratio	0.56	0.77	0.56	0.32	0.80	0.33	0.60	0.57
Control Delay	50.3	32.2	53.1	30.6	43.1	27.8	48.8	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	32.2	53.1	30.6	43.1	27.8	48.8	30.9
Queue Length 50th (ft)	76	166	69	65	231	71	94	51
Queue Length 95th (ft)	156	281	147	123	387	120	183	105
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	335	1174	271	1013	774	1570	408	891
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.62	0.44	0.27	0.55	0.19	0.40	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	375	290	110	212	36	388	232	41	152	154	97
Future Volume (veh/h)	122	375	290	110	212	36	388	232	41	152	154	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	133	408	0	120	230	0	422	252	0	165	167	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	175	672		157	636		505	918		217	344	
Arrive On Green	0.10	0.19	0.00	0.09	0.18	0.00	0.29	0.26	0.00	0.12	0.10	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	133	408	0	120	230	0	422	252	0	165	167	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	3.9	5.6	0.0	3.5	3.1	0.0	12.0	3.0	0.0	4.8	2.4	0.0
Cycle Q Clear(g_c), s	3.9	5.6	0.0	3.5	3.1	0.0	12.0	3.0	0.0	4.8	2.4	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	175	672		157	636		505	918		217	344	
V/C Ratio(X)	0.76	0.61		0.76	0.36		0.84	0.27		0.76	0.49	
Avail Cap(c_a), veh/h	553	1884		447	1673		1276	2625		673	1421	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.4	19.8	0.0	23.8	19.2	0.0	17.9	15.7	0.0	22.6	22.8	0.0
Incr Delay (d2), s/veh	6.6	0.9	0.0	7.5	0.3	0.0	3.7	0.2	0.0	5.5	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.1	0.0	1.7	1.1	0.0	4.7	1.1	0.0	2.1	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	20.6	0.0	31.3	19.5	0.0	21.6	15.9	0.0	28.1	23.9	0.0
LnGrp LOS	C	C		C	B		C	B		C	C	
Approach Vol, veh/h		541			350			674			332	
Approach Delay, s/veh		23.0			23.5			19.5			26.0	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	18.4	9.2	14.7	19.7	9.7	9.8	14.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.3	39.7	13.5	28.5	38.5	21.5	16.7	25.3
Max Q Clear Time (g_c+I1), s	6.8	5.0	5.5	7.6	14.0	4.4	5.9	5.1
Green Ext Time (p_c), s	0.3	1.6	0.2	2.5	1.3	0.8	0.2	1.3

Intersection Summary	
HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	613	366	388	282	446
v/c Ratio	0.67	0.71	0.18	0.63	0.61
Control Delay	28.5	34.4	7.0	34.7	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	34.4	7.0	34.7	6.9
Queue Length 50th (ft)	117	150	36	116	0
Queue Length 95th (ft)	246	329	77	261	79
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1418	970	3129	921	1036
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.38	0.12	0.31	0.43

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	373	191	337	357	259	410
Future Volume (veh/h)	373	191	337	357	259	410
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	405	208	366	388	282	446
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	548	278	426	1926	579	515
Arrive On Green	0.24	0.24	0.24	0.55	0.33	0.33
Sat Flow, veh/h	2356	1148	1767	3618	1767	1572
Grp Volume(v), veh/h	314	299	366	388	282	446
Grp Sat Flow(s),veh/h/ln	1763	1649	1767	1763	1767	1572
Q Serve(g_s), s	11.8	12.0	14.2	4.0	9.1	19.0
Cycle Q Clear(g_c), s	11.8	12.0	14.2	4.0	9.1	19.0
Prop In Lane		0.70	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	427	399	426	1926	579	515
V/C Ratio(X)	0.74	0.75	0.86	0.20	0.49	0.87
Avail Cap(c_a), veh/h	727	680	977	3625	927	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	25.1	25.9	8.3	19.2	22.6
Incr Delay (d2), s/veh	2.5	2.8	5.1	0.1	0.6	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	4.7	6.1	1.3	3.6	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.5	27.9	31.1	8.3	19.9	28.3
LnGrp LOS	C	C	C	A	B	C
Approach Vol, veh/h	613			754	728	
Approach Delay, s/veh	27.7			19.4	25.0	
Approach LOS	C			B	C	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		27.9	21.7	21.8				43.6
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		37.5	39.5	29.5				73.5
Max Q Clear Time (g_c+I1), s		21.0	16.2	14.0				6.0
Green Ext Time (p_c), s		2.4	1.1	3.3				2.8

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	21	656	80	609	114	82
v/c Ratio	0.06	0.38	0.19	0.28	0.29	0.11
Control Delay	22.9	12.1	20.7	7.3	19.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	12.1	20.7	7.3	19.9	0.3
Queue Length 50th (ft)	5	72	19	34	27	0
Queue Length 95th (ft)	25	142	60	118	77	0
Internal Link Dist (ft)		424		851		1161
Turn Bay Length (ft)	125		125		75	
Base Capacity (vph)	666	3260	1016	3479	1097	1321
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.20	0.08	0.18	0.10	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	521	83	74	559	1	105	0	75	0	0	0
Future Volume (veh/h)	19	521	83	74	559	1	105	0	75	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	21	566	90	80	608	1	114	0	82	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	47	1081	171	142	1474	2	463	0	206	231	243	0
Arrive On Green	0.03	0.35	0.35	0.08	0.41	0.41	0.13	0.00	0.13	0.00	0.00	0.00
Sat Flow, veh/h	1767	3048	483	1767	3611	6	1767	0	1572	1306	1856	0
Grp Volume(v), veh/h	21	327	329	80	297	312	114	0	82	0	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1769	1767	1763	1854	1767	0	1572	1306	1856	0
Q Serve(g_s), s	0.4	4.6	4.6	1.4	3.7	3.7	1.9	0.0	1.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	4.6	4.6	1.4	3.7	3.7	1.9	0.0	1.5	0.0	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	47	625	627	142	719	757	463	0	206	231	243	0
V/C Ratio(X)	0.45	0.52	0.53	0.56	0.41	0.41	0.25	0.00	0.40	0.00	0.00	0.00
Avail Cap(c_a), veh/h	653	2862	2871	1221	3429	3607	2192	0	1744	1508	2058	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	14.9	8.0	8.0	13.8	6.6	6.6	12.5	0.0	12.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.5	0.7	0.7	3.5	0.4	0.4	0.3	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.1	1.1	0.5	0.8	0.8	0.6	0.0	0.5	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.4	8.6	8.6	17.3	6.9	6.9	12.8	0.0	13.6	0.0	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	B	A	A	A
Approach Vol, veh/h		677			689			196			0	
Approach Delay, s/veh		9.0			8.1			13.2			0.0	
Approach LOS		A			A			B				
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		8.6	7.0	15.5		8.6	5.3	17.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		34.5	21.5	50.5		34.5	11.5	60.5				
Max Q Clear Time (g_c+I1), s		3.9	3.4	6.6		0.0	2.4	5.7				
Green Ext Time (p_c), s		0.8	0.2	4.4		0.0	0.0	4.0				
Intersection Summary												
HCM 6th Ctrl Delay			9.1									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	358	397	722	268	215	75	902
v/c Ratio	0.58	0.21	0.71	0.48	0.50	0.17	0.79
Control Delay	36.7	10.9	29.3	36.0	9.9	35.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	10.9	29.3	36.0	9.9	35.2	8.6
Queue Length 50th (ft)	80	46	148	61	0	17	0
Queue Length 95th (ft)	170	106	292	133	66	43	57
Internal Link Dist (ft)		852	424	1178			
Turn Bay Length (ft)	275				450	100	300
Base Capacity (vph)	884	2654	1512	893	559	1323	1625
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.15	0.48	0.30	0.38	0.06	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	365	0	0	491	173	0	247	198	69	0	830
Future Volume (veh/h)	329	365	0	0	491	173	0	247	198	69	0	830
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	0	1856	1856	1856	0	1856
Adj Flow Rate, veh/h	358	397	0	0	534	188	0	268	215	75	0	902
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	3	3	0	3
Cap, veh/h	512	1836	0	0	756	265	0	674	301	205	0	0
Arrive On Green	0.15	0.52	0.00	0.00	0.30	0.30	0.00	0.19	0.19	0.06	0.00	0.00
Sat Flow, veh/h	3428	3618	0	0	2652	897	0	3618	1572	3428	75	
Grp Volume(v), veh/h	358	397	0	0	367	355	0	268	215	75	27.8	
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1763	1694	0	1763	1572	1714	C	
Q Serve(g_s), s	5.9	3.6	0.0	0.0	11.0	11.1	0.0	3.9	7.6	1.2		
Cycle Q Clear(g_c), s	5.9	3.6	0.0	0.0	11.0	11.1	0.0	3.9	7.6	1.2		
Prop In Lane	1.00		0.00	0.00		0.53	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	512	1836	0	0	521	500	0	674	301	205		
V/C Ratio(X)	0.70	0.22	0.00	0.00	0.71	0.71	0.00	0.40	0.71	0.37		
Avail Cap(c_a), veh/h	1141	3437	0	0	998	959	0	1150	513	1709		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	23.9	7.7	0.0	0.0	18.6	18.6	0.0	20.9	22.4	26.7		
Incr Delay (d2), s/veh	1.7	0.1	0.0	0.0	1.8	1.9	0.0	0.4	3.2	1.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.3	1.1	0.0	0.0	4.2	4.1	0.0	1.5	2.9	0.5		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	7.7	0.0	0.0	20.3	20.5	0.0	21.3	25.6	27.8		
LnGrp LOS	C	A	A	A	C	C	A	C	C	C		
Approach Vol, veh/h		755			722			483				
Approach Delay, s/veh		16.2			20.4			23.2				
Approach LOS		B			C			C				

Timer - Assigned Phs	1	2		4			7	8				
Phs Duration (G+Y+Rc), s	8.0	15.8		35.3			13.3	22.0				
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s	29.5	19.3		57.7			19.7	33.5				
Max Q Clear Time (g_c+I1), s	3.2	9.6		5.6			7.9	13.1				
Green Ext Time (p_c), s	0.2	1.7		2.8			1.0	4.4				

Intersection Summary			
HCM 6th Ctrl Delay			19.8
HCM 6th LOS			B

Lane Group	EBL	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL	SWR
Lane Group Flow (vph)	79	534	379	320	1109	117	143	154	127	331
v/c Ratio	0.49	0.48	0.50	0.62	0.78	0.49	0.57	0.44	0.38	0.81
Control Delay	60.7	28.8	5.4	48.1	31.0	51.4	53.2	11.8	41.6	40.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	28.8	5.4	48.1	31.0	51.4	53.2	11.8	41.6	40.2
Queue Length 50th (ft)	50	140	0	103	331	73	90	0	73	125
Queue Length 95th (ft)	#119	221	67	170	478	145	172	60	143	#265
Internal Link Dist (ft)		693			852		265		1072	
Turn Bay Length (ft)	150		200	285		125		125		
Base Capacity (vph)	186	1593	919	681	1877	353	371	439	500	545
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.34	0.41	0.47	0.59	0.33	0.39	0.35	0.25	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	73	491	349	294	858	162	108	132	142	117	0	275
Future Volume (vph)	73	491	349	294	858	162	108	132	142	117	0	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	1568	3400	3421		1752	1845	1568		1752	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	1568	3400	3421		1752	1845	1568		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	534	379	320	933	176	117	143	154	127	0	299
RTOR Reduction (vph)	0	0	252	0	0	0	0	0	133	0	0	110
Lane Group Flow (vph)	79	534	127	320	1109	0	117	143	21	0	127	221
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Prot	Prot	Prot	Prot
Protected Phases	5	2		1	6		4	4	4	8	8	8
Permitted Phases			2									
Actuated Green, G (s)	6.7	32.5	32.5	14.6	40.4		13.3	13.3	13.3		18.4	18.4
Effective Green, g (s)	6.7	32.5	32.5	14.6	40.4		13.3	13.3	13.3		18.4	18.4
Actuated g/C Ratio	0.07	0.34	0.34	0.15	0.42		0.14	0.14	0.14		0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	121	1176	526	512	1427		240	253	215		333	298
v/s Ratio Prot	0.05	0.15		c0.09	c0.32		0.07	c0.08	0.01		0.07	c0.14
v/s Ratio Perm			0.08									
v/c Ratio	0.65	0.45	0.24	0.62	0.78		0.49	0.57	0.10		0.38	0.74
Uniform Delay, d1	43.9	25.2	23.2	38.5	24.3		38.6	39.0	36.5		34.2	37.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	12.0	0.3	0.2	2.4	2.7		1.6	2.9	0.2		0.7	9.5
Delay (s)	55.9	25.5	23.5	40.9	27.1		40.2	41.9	36.7		35.0	46.5
Level of Service	E	C	C	D	C		D	D	D		C	D
Approach Delay (s)		27.1			30.2			39.5			43.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	96.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	32
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	34	67	336	83	178	223
v/c Ratio	0.08	0.16	0.29	0.14	0.30	0.09
Control Delay	16.6	7.1	12.4	4.9	14.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	7.1	12.4	4.9	14.0	2.8
Queue Length 50th (ft)	6	0	32	0	32	7
Queue Length 95th (ft)	27	25	67	23	82	17
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1350	1224	3290	1477	1696	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.05	0.10	0.06	0.10	0.06

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	62	309	76	164	205
Future Volume (veh/h)	31	62	309	76	164	205
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	67	336	83	178	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	173	154	842	376	308	2032
Arrive On Green	0.10	0.10	0.24	0.24	0.17	0.58
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	34	67	336	83	178	223
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	0.5	1.1	2.2	1.2	2.6	0.8
Cycle Q Clear(g_c), s	0.5	1.1	2.2	1.2	2.6	0.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	173	154	842	376	308	2032
V/C Ratio(X)	0.20	0.44	0.40	0.22	0.58	0.11
Avail Cap(c_a), veh/h	1697	1510	4918	2193	2657	10793
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.7	8.8	8.4	10.5	2.6
Incr Delay (d2), s/veh	0.6	1.9	0.3	0.3	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.5	0.2	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.0	13.7	9.1	8.7	12.2	2.7
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	101		419			401
Approach Delay, s/veh	13.1		9.1			6.9
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.3	11.1				20.4		7.2
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	41.5	38.5				84.5		26.5
Max Q Clear Time (g_c+I1), s	4.6	4.2				2.8		3.1
Green Ext Time (p_c), s	0.5	2.4				1.5		0.2

Intersection Summary			
HCM 6th Ctrl Delay			8.6
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	90	143	142	96	37	297	87	118	503
v/c Ratio	0.16	0.22	0.31	0.24	0.16	0.11	0.24	0.22	0.14	0.50
Control Delay	26.1	24.0	24.6	21.7	2.9	27.0	20.2	25.6	17.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	24.0	24.6	21.7	2.9	27.0	20.2	25.6	17.7	4.6
Queue Length 50th (ft)	18	25	43	41	0	11	43	26	23	0
Queue Length 95th (ft)	56	73	107	102	19	42	92	75	83	71
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	623	861	884	1156	1033	474	2710	718	1629	1443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.10	0.16	0.12	0.09	0.08	0.11	0.12	0.07	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	68	15	132	131	88	34	234	40	80	109	463
Future Volume (veh/h)	54	68	15	132	131	88	34	234	40	80	109	463
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	59	74	16	143	142	96	37	254	43	87	118	503
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	99	149	32	191	283	240	71	1073	179	125	715	606
Arrive On Green	0.06	0.10	0.10	0.11	0.15	0.15	0.04	0.35	0.35	0.07	0.39	0.39
Sat Flow, veh/h	1767	1478	320	1767	1856	1572	1767	3023	505	1767	1856	1572
Grp Volume(v), veh/h	59	0	90	143	142	96	37	147	150	87	118	503
Grp Sat Flow(s),veh/h/ln	1767	0	1798	1767	1856	1572	1767	1763	1765	1767	1856	1572
Q Serve(g_s), s	1.6	0.0	2.3	3.9	3.5	2.7	1.0	2.9	3.0	2.4	2.1	14.2
Cycle Q Clear(g_c), s	1.6	0.0	2.3	3.9	3.5	2.7	1.0	2.9	3.0	2.4	2.1	14.2
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	99	0	182	191	283	240	71	626	626	125	715	606
V/C Ratio(X)	0.59	0.00	0.50	0.75	0.50	0.40	0.52	0.23	0.24	0.70	0.17	0.83
Avail Cap(c_a), veh/h	413	0	748	807	1187	1006	305	1557	1559	556	1903	1612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	21.0	21.3	19.1	18.8	23.2	11.2	11.2	22.4	9.9	13.7
Incr Delay (d2), s/veh	5.6	0.0	2.1	5.8	1.4	1.1	5.7	0.2	0.2	6.8	0.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.0	1.8	1.4	1.0	0.5	1.0	1.0	1.1	0.7	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	23.0	27.1	20.5	19.9	28.9	11.4	11.4	29.2	10.0	16.7
LnGrp LOS	C	A	C	C	C	B	C	B	B	C	B	B
Approach Vol, veh/h		149			381			334			708	
Approach Delay, s/veh		25.1			22.9			13.3			17.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	22.0	9.8	9.5	6.5	23.5	7.3	12.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	43.5	22.5	20.5	8.5	50.5	11.5	31.5
Max Q Clear Time (g_c+I1), s	4.4	5.0	5.9	4.3	3.0	16.2	3.6	5.5
Green Ext Time (p_c), s	0.1	1.9	0.3	0.3	0.0	2.7	0.1	1.1

Intersection Summary			
HCM 6th Ctrl Delay			18.5
HCM 6th LOS			B

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	437	925	584	37	1554	215
v/c Ratio	0.44	0.78	0.28	0.04	0.75	0.14
Control Delay	27.1	16.5	9.5	3.3	16.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	16.5	9.5	3.3	16.2	0.2
Queue Length 50th (ft)	88	90	67	0	268	0
Queue Length 95th (ft)	194	253	151	14	560	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	2122	1928	3176	1424	3176	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.48	0.18	0.03	0.49	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	402	0	851	0	537	34	0	1430	198
Future Volume (veh/h)	0	0	0	402	0	851	0	537	34	0	1430	198
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				437	0	925	0	584	37	0	1554	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1287	0	1039	0	1902	848	0	1902	
Arrive On Green				0.38	0.00	0.38	0.00	0.54	0.54	0.00	0.54	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				437	0	925	0	584	37	0	1554	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				9.7	0.0	33.2	0.0	9.7	1.2	0.0	38.4	0.0
Cycle Q Clear(g_c), s				9.7	0.0	33.2	0.0	9.7	1.2	0.0	38.4	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1287	0	1039	0	1902	848	0	1902	
V/C Ratio(X)				0.34	0.00	0.89	0.00	0.31	0.04	0.00	0.82	
Avail Cap(c_a), veh/h				1505	0	1215	0	2813	1255	0	2813	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				23.7	0.0	31.0	0.0	13.5	11.5	0.0	20.1	0.0
Incr Delay (d2), s/veh				0.2	0.0	7.6	0.0	0.1	0.0	0.0	1.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.8	0.0	11.6	0.0	3.6	0.4	0.0	14.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.8	0.0	38.6	0.0	13.5	11.5	0.0	21.3	0.0
LnGrp LOS				C	A	D	A	B	B	A	C	
Approach Vol, veh/h					1362			621			1554	
Approach Delay, s/veh					33.9			13.4			21.3	
Approach LOS					C			B			C	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		61.6				61.6		44.3				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		84.5				84.5		46.5				
Max Q Clear Time (g_c+I1), s		11.7				40.4		35.2				
Green Ext Time (p_c), s		4.3				16.7		4.6				
Intersection Summary												
HCM 6th Ctrl Delay			24.8									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	24	684	1033	147	736	1062	188	1	2
v/c Ratio	0.20	0.71	0.66	0.58	0.34	0.79	0.20	0.01	0.01
Control Delay	47.7	33.8	2.2	47.4	18.8	28.6	0.5	45.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	33.8	2.2	47.4	18.8	28.6	0.5	45.0	0.0
Queue Length 50th (ft)	13	174	0	75	82	253	0	1	0
Queue Length 95th (ft)	44	296	0	#178	181	409	0	7	0
Internal Link Dist (ft)		1084			414		644		
Turn Bay Length (ft)	230			215		425		100	
Base Capacity (vph)	126	1175	1568	294	2292	1749	1080	384	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.58	0.66	0.50	0.32	0.61	0.17	0.00	0.00

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	629	950	135	676	1	977	0	173	1	0	2
Future Volume (veh/h)	22	629	950	135	676	1	977	0	173	1	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	684	0	147	735	1	1062	0	0	1	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	47	912		187	1765	2	1280	567		127	8	6
Arrive On Green	0.03	0.26	0.00	0.11	0.34	0.34	0.37	0.00	0.00	0.07	0.00	0.00
Sat Flow, veh/h	1767	3526	1572	1767	5224	7	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	24	684	0	147	475	261	1062	0	0	1	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1854	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	0.9	12.4	0.0	5.7	7.6	7.6	19.6	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.9	12.4	0.0	5.7	7.6	7.6	19.6	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	47	912		187	1141	626	1280	567		127	8	6
V/C Ratio(X)	0.51	0.75		0.79	0.42	0.42	0.83	0.00		0.01	0.00	0.31
Avail Cap(c_a), veh/h	150	1391		350	1715	941	2075	1136		456	492	417
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.5	23.8	0.0	30.4	17.8	17.8	19.8	0.0	0.0	30.1	0.0	34.6
Incr Delay (d2), s/veh	8.3	1.3	0.0	7.1	0.2	0.4	1.6	0.0	0.0	0.0	0.0	25.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.8	0.0	2.6	2.7	3.0	7.4	0.0	0.0	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.7	25.0	0.0	37.5	18.0	18.2	21.4	0.0	0.0	30.1	0.0	60.5
LnGrp LOS	D	C		D	B	B	C	A		C	A	E
Approach Vol, veh/h		708			883			1062			3	
Approach Delay, s/veh		25.6			21.3			21.4			50.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	25.8	11.9	22.5	30.5	4.8	6.4	28.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	42.7	13.8	27.5	42.2	18.5	5.9	35.4
Max Q Clear Time (g_c+I1), s	2.0	0.0	7.7	14.4	21.6	2.1	2.9	9.6
Green Ext Time (p_c), s	0.0	0.0	0.2	3.6	4.4	0.0	0.0	4.7

Intersection Summary	
HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	59	662	242	33	676	164	28	2	4
v/c Ratio	0.15	0.33	0.24	0.09	0.38	0.20	0.04	0.01	0.01
Control Delay	21.7	10.0	3.0	22.8	12.3	19.6	0.1	25.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	10.0	3.0	22.8	12.3	19.6	0.1	25.0	0.0
Queue Length 50th (ft)	13	32	0	7	69	18	0	1	0
Queue Length 95th (ft)	54	157	40	37	169	58	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	848	3333	1503	657	3289	1770	1281	428	1028
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.20	0.16	0.05	0.21	0.09	0.02	0.00	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	609	223	30	622	0	151	0	26	2	0	4
Future Volume (veh/h)	54	609	223	30	622	0	151	0	26	2	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	59	662	0	33	676	0	164	0	28	2	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	107	1257		68	1179	0	364	265	225	5	0	62
Arrive On Green	0.06	0.36	0.00	0.04	0.33	0.00	0.11	0.00	0.14	0.00	0.00	0.04
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	59	662	0	33	676	0	164	0	28	2	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.3	5.8	0.0	0.7	6.2	0.0	1.8	0.0	0.6	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.3	5.8	0.0	0.7	6.2	0.0	1.8	0.0	0.6	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	107	1257		68	1179	0	364	265	225	5	0	62
V/C Ratio(X)	0.55	0.53		0.48	0.57	0.00	0.45	0.00	0.12	0.41	0.00	0.06
Avail Cap(c_a), veh/h	699	4723		519	4364	0	1531	1444	1224	338	0	823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.9	10.0	0.0	18.5	10.7	0.0	16.4	0.0	14.7	19.5	0.0	18.1
Incr Delay (d2), s/veh	4.4	0.3	0.0	5.3	0.4	0.0	0.9	0.0	0.2	47.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.6	0.0	0.3	1.7	0.0	0.6	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	10.3	0.0	23.7	11.2	0.0	17.3	0.0	14.9	67.1	0.0	18.6
LnGrp LOS	C	B		C	B	A	B	A	B	E	A	B
Approach Vol, veh/h		721			709			192			6	
Approach Delay, s/veh		11.3			11.8			17.0			34.7	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	10.1	6.0	18.5	8.7	6.0	6.9	17.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	30.5	11.5	52.5	17.5	20.5	15.5	48.5
Max Q Clear Time (g_c+I1), s	2.0	2.6	2.7	7.8	3.8	2.1	3.3	8.2
Green Ext Time (p_c), s	0.0	0.1	0.0	4.8	0.4	0.0	0.1	4.9

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	434	228	42	534	130	23
v/c Ratio	0.25	0.26	0.09	0.25	0.14	0.05
Control Delay	8.9	3.1	14.7	4.6	13.4	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	3.1	14.7	4.6	13.4	8.2
Queue Length 50th (ft)	18	0	4	23	6	0
Queue Length 95th (ft)	72	33	29	43	32	14
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1437	3505	2987	1380
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.03	0.15	0.04	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	399	210	39	491	120	21
Future Volume (veh/h)	399	210	39	491	120	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	434	228	42	534	130	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1059	472	277	2113	400	184
Arrive On Green	0.30	0.30	0.16	0.60	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	434	228	42	534	130	23
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	3.1	3.8	0.7	2.3	1.1	0.4
Cycle Q Clear(g_c), s	3.1	3.8	0.7	2.3	1.1	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1059	472	277	2113	400	184
V/C Ratio(X)	0.41	0.48	0.15	0.25	0.32	0.13
Avail Cap(c_a), veh/h	5619	2506	1422	8957	3300	1514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.8	9.1	11.5	3.0	12.8	12.5
Incr Delay (d2), s/veh	0.3	0.8	0.3	0.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.9	0.2	0.1	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	9.8	11.8	3.1	13.3	12.8
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	662			576	153	
Approach Delay, s/veh	9.4			3.7	13.2	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	8.2	9.5	14.0	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.5	25.5	50.5	80.5
Max Q Clear Time (g_c+I1), s	3.1	2.7	5.8	4.3
Green Ext Time (p_c), s	0.5	0.1	3.8	3.8

Intersection Summary	
HCM 6th Ctrl Delay	7.4
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	925	203	846	40	17	185	133	91
v/c Ratio	0.35	0.69	0.57	0.47	0.05	0.06	0.38	0.60	0.22
Control Delay	42.0	23.7	38.2	15.1	2.6	28.8	8.8	42.3	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	23.7	38.2	15.1	2.6	28.8	8.8	42.3	11.5
Queue Length 50th (ft)	32	177	83	133	0	6	5	54	6
Queue Length 95th (ft)	98	351	208	257	12	28	63	148	49
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	336	2258	661	2763	1247	632	867	499	832
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.41	0.31	0.31	0.03	0.03	0.21	0.27	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	814	37	187	778	37	16	12	158	122	15	69
Future Volume (veh/h)	69	814	37	187	778	37	16	12	158	122	15	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	885	40	203	846	40	17	13	172	133	16	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	106	1270	57	261	1612	719	393	28	376	307	72	338
Arrive On Green	0.06	0.37	0.37	0.15	0.46	0.46	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1767	3435	155	1767	3526	1572	1295	112	1478	1189	284	1332
Grp Volume(v), veh/h	75	454	471	203	846	40	17	0	185	133	0	91
Grp Sat Flow(s),veh/h/ln	1767	1763	1828	1767	1763	1572	1295	0	1590	1189	0	1616
Q Serve(g_s), s	2.5	12.9	12.9	6.5	10.1	0.8	0.6	0.0	5.8	6.3	0.0	2.6
Cycle Q Clear(g_c), s	2.5	12.9	12.9	6.5	10.1	0.8	3.2	0.0	5.8	12.1	0.0	2.6
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.93	1.00		0.82
Lane Grp Cap(c), veh/h	106	651	675	261	1612	719	393	0	404	307	0	411
V/C Ratio(X)	0.71	0.70	0.70	0.78	0.52	0.06	0.04	0.00	0.46	0.43	0.00	0.22
Avail Cap(c_a), veh/h	404	1358	1408	793	3492	1557	821	0	928	700	0	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	15.8	15.8	24.2	11.4	8.9	18.7	0.0	18.6	23.7	0.0	17.4
Incr Delay (d2), s/veh	8.4	1.4	1.3	5.0	0.3	0.0	0.0	0.0	0.8	1.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.8	5.0	2.9	3.4	0.3	0.2	0.0	2.0	1.7	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.6	17.2	17.1	29.2	11.7	9.0	18.7	0.0	19.4	24.7	0.0	17.7
LnGrp LOS	D	B	B	C	B	A	B	A	B	C	A	B
Approach Vol, veh/h		1000			1089			202			224	
Approach Delay, s/veh		18.5			14.9			19.3			21.8	
Approach LOS		B			B			B			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.5	13.2	26.3		19.5	8.0	31.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		34.5	26.5	45.5		34.5	13.5	58.5				
Max Q Clear Time (g_c+I1), s		7.8	8.5	14.9		14.1	4.5	12.1				
Green Ext Time (p_c), s		1.2	0.5	6.9		0.9	0.1	7.5				
Intersection Summary												
HCM 6th Ctrl Delay			17.3									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	527	422	498	92	48	430	109	58	60
v/c Ratio	0.38	0.67	0.75	0.30	0.42	0.21	0.75	0.45	0.24	0.18
Control Delay	47.9	36.5	37.8	15.1	45.6	39.8	13.3	45.3	39.0	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	36.5	37.8	15.1	45.6	39.8	13.3	45.3	39.0	1.2
Queue Length 50th (ft)	37	128	202	75	46	24	0	55	29	0
Queue Length 95th (ft)	101	#258	403	155	116	65	94	132	73	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	245	991	843	2124	416	628	817	416	628	623
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.53	0.50	0.23	0.22	0.08	0.53	0.26	0.09	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	411	74	388	324	134	85	44	396	100	53	55
Future Volume (veh/h)	67	411	74	388	324	134	85	44	396	100	53	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	73	447	80	422	352	146	92	48	430	109	58	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	94	549	98	467	964	393	130	512	434	147	530	449
Arrive On Green	0.05	0.18	0.18	0.26	0.39	0.39	0.07	0.28	0.28	0.08	0.29	0.29
Sat Flow, veh/h	1767	2991	532	1767	2443	996	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	73	262	265	422	252	246	92	48	430	109	58	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1760	1767	1763	1676	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.8	13.3	13.5	21.6	9.5	9.7	4.8	1.8	25.5	5.6	2.2	2.6
Cycle Q Clear(g_c), s	3.8	13.3	13.5	21.6	9.5	9.7	4.8	1.8	25.5	5.6	2.2	2.6
Prop In Lane	1.00		0.30	1.00		0.59	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	324	323	467	696	662	130	512	434	147	530	449
V/C Ratio(X)	0.78	0.81	0.82	0.90	0.36	0.37	0.71	0.09	0.99	0.74	0.11	0.13
Avail Cap(c_a), veh/h	200	409	409	690	898	854	340	512	434	340	530	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	36.6	36.7	33.2	20.0	20.1	42.3	25.2	33.7	41.8	24.6	24.8
Incr Delay (d2), s/veh	12.6	9.3	10.0	11.2	0.3	0.3	6.8	0.1	40.7	7.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	6.5	6.6	10.4	3.8	3.8	2.3	0.8	14.3	2.7	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.3	45.9	46.7	44.4	20.3	20.4	49.1	25.2	74.4	48.9	24.7	24.9
LnGrp LOS	E	D	D	D	C	C	D	C	E	D	C	C
Approach Vol, veh/h		600			920			570			227	
Approach Delay, s/veh		47.5			31.4			66.2			36.4	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	30.3	29.2	21.7	11.4	31.2	9.5	41.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	25.8	36.5	21.7	18.0	25.8	10.6	47.6
Max Q Clear Time (g_c+I1), s	7.6	27.5	23.6	15.5	6.8	4.6	5.8	11.7
Green Ext Time (p_c), s	0.2	0.0	1.1	1.7	0.1	0.4	0.1	3.4

Intersection Summary			
HCM 6th Ctrl Delay			44.6
HCM 6th LOS			D

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	513	27	897	79	511
v/c Ratio	0.57	0.07	0.63	0.30	0.26
Control Delay	24.7	9.9	15.8	32.0	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	9.9	15.8	32.0	6.6
Queue Length 50th (ft)	88	0	118	27	40
Queue Length 95th (ft)	175	21	229	82	82
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2091	886	2872	530	3413
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.25	0.03	0.31	0.15	0.15

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	469	28	523	303	73	470
Future Volume (veh/h)	469	28	523	303	73	470
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	510	30	568	329	79	511
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	775	345	893	517	123	2057
Arrive On Green	0.22	0.22	0.42	0.42	0.07	0.58
Sat Flow, veh/h	3534	1572	2243	1244	1767	3618
Grp Volume(v), veh/h	510	30	466	431	79	511
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1632	1767	1763
Q Serve(g_s), s	6.0	0.7	9.6	9.6	2.0	3.2
Cycle Q Clear(g_c), s	6.0	0.7	9.6	9.6	2.0	3.2
Prop In Lane	1.00	1.00		0.76	1.00	
Lane Grp Cap(c), veh/h	775	345	732	678	123	2057
V/C Ratio(X)	0.66	0.09	0.64	0.64	0.64	0.25
Avail Cap(c_a), veh/h	2673	1189	2145	1985	639	5913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	14.2	10.6	10.6	20.7	4.6
Incr Delay (d2), s/veh	1.0	0.1	0.9	1.0	5.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.2	3.0	2.8	0.9	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.2	14.3	11.5	11.6	26.2	4.7
LnGrp LOS	B	B	B	B	C	A
Approach Vol, veh/h	540		897			590
Approach Delay, s/veh	17.0		11.6			7.6
Approach LOS	B		B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.7	23.4				31.1		14.5
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	16.5	55.5				76.5		34.5
Max Q Clear Time (g_c+I1), s	4.0	11.6				5.2		8.0
Green Ext Time (p_c), s	0.1	7.4				4.0		2.0

Intersection Summary		
HCM 6th Ctrl Delay		11.9
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	225	110	442	433	196
v/c Ratio	0.49	0.06	0.54	0.49	0.38
Control Delay	20.4	5.6	9.3	17.1	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	5.6	9.3	17.1	5.7
Queue Length 50th (ft)	49	6	16	45	0
Queue Length 95th (ft)	127	17	58	103	45
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1476	3505	2142	2715	1193
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.03	0.21	0.16	0.16

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	207	101	127	280	328	250		
Future Volume (veh/h)	207	101	127	280	328	250		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	225	110	138	304	415	210		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	302	1985	502	448	787	350		
Arrive On Green	0.17	0.56	0.28	0.28	0.22	0.22		
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572		
Grp Volume(v), veh/h	225	110	138	304	415	210		
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572		
Q Serve(g_s), s	5.1	0.6	2.6	7.2	4.3	5.0		
Cycle Q Clear(g_c), s	5.1	0.6	2.6	7.2	4.3	5.0		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	302	1985	502	448	787	350		
V/C Ratio(X)	0.74	0.06	0.27	0.68	0.53	0.60		
Avail Cap(c_a), veh/h	1662	6170	1238	1105	3156	1404		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	16.5	4.1	11.6	13.3	14.4	14.6		
Incr Delay (d2), s/veh	3.6	0.0	0.3	1.8	0.6	1.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.1	0.1	0.9	2.3	1.5	4.5		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	20.2	4.1	11.9	15.1	14.9	16.3		
LnGrp LOS	C	A	B	B	B	B		
Approach Vol, veh/h		335	442		625			
Approach Delay, s/veh		14.9	14.1		15.4			
Approach LOS		B	B		B			
Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				28.2		13.8	11.7	16.5
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				73.5		37.5	39.5	29.5
Max Q Clear Time (g_c+I1), s				2.6		7.0	7.1	9.2
Green Ext Time (p_c), s				0.8		2.3	0.7	2.8

Intersection Summary		
HCM 6th Ctrl Delay		14.9
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	11	368	5	19	342	129	23	249
v/c Ratio	0.22	0.04	0.65	0.02	0.08	0.60	0.07	0.10	0.37
Control Delay	24.9	22.1	9.2	28.4	20.5	20.2	9.1	27.0	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	22.1	9.2	28.4	20.5	20.2	9.1	27.0	16.3
Queue Length 50th (ft)	14	2	0	1	2	68	5	5	18
Queue Length 95th (ft)	65	18	69	13	23	221	36	33	73
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	480	1274	1196	211	924	1493	3300	287	1748
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.01	0.31	0.02	0.02	0.23	0.04	0.08	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	10	339	5	9	8	315	116	3	21	146	83
Future Volume (veh/h)	59	10	339	5	9	8	315	116	3	21	146	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	64	11	368	5	10	9	342	126	3	23	159	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	102	522	442	12	207	187	422	1209	29	48	292	157
Arrive On Green	0.06	0.28	0.28	0.01	0.23	0.23	0.24	0.34	0.34	0.03	0.13	0.13
Sat Flow, veh/h	1767	1856	1572	1767	900	810	1767	3520	84	1767	2214	1190
Grp Volume(v), veh/h	64	11	368	5	0	19	342	63	66	23	125	124
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1710	1767	1763	1841	1767	1763	1641
Q Serve(g_s), s	1.9	0.2	11.6	0.1	0.0	0.5	9.6	1.3	1.3	0.7	3.5	3.7
Cycle Q Clear(g_c), s	1.9	0.2	11.6	0.1	0.0	0.5	9.6	1.3	1.3	0.7	3.5	3.7
Prop In Lane	1.00		1.00	1.00		0.47	1.00		0.05	1.00		0.72
Lane Grp Cap(c), veh/h	102	522	442	12	0	394	422	606	632	48	233	217
V/C Ratio(X)	0.63	0.02	0.83	0.42	0.00	0.05	0.81	0.10	0.10	0.48	0.54	0.57
Avail Cap(c_a), veh/h	419	1108	939	184	0	794	1390	1922	2006	251	785	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	13.7	17.8	26.1	0.0	15.8	19.0	11.8	11.8	25.3	21.4	21.5
Incr Delay (d2), s/veh	6.2	0.0	4.1	22.2	0.0	0.1	3.8	0.1	0.1	7.3	1.9	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.1	4.2	0.1	0.0	0.2	3.9	0.4	0.5	0.4	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	13.7	21.9	48.3	0.0	15.8	22.7	11.9	11.9	32.6	23.3	23.9
LnGrp LOS	C	B	C	D	A	B	C	B	B	C	C	C
Approach Vol, veh/h		443			24			471			272	
Approach Delay, s/veh		22.9			22.6			19.8			24.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	22.6	4.9	19.3	17.1	11.5	7.5	16.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	57.5	5.5	31.5	41.5	23.5	12.5	24.5
Max Q Clear Time (g_c+I1), s	2.7	3.3	2.1	13.6	11.6	5.7	3.9	2.5
Green Ext Time (p_c), s	0.0	0.7	0.0	1.3	1.0	1.2	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	338	40	162	130	351	34	424
v/c Ratio	0.31	0.33	0.15	0.27	0.36	0.28	0.13	0.49
Control Delay	26.5	11.7	27.5	21.7	26.1	14.2	27.7	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	11.7	27.5	21.7	26.1	14.2	27.7	16.4
Queue Length 50th (ft)	31	19	12	20	39	32	10	44
Queue Length 95th (ft)	85	72	44	55	100	93	40	100
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	804	2051	451	1642	928	2962	412	2280
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.16	0.09	0.10	0.14	0.12	0.08	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	163	148	37	112	37	120	268	55	31	233	157
Future Volume (veh/h)	95	163	148	37	112	37	120	268	55	31	233	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	103	177	0	40	122	0	130	291	0	34	253	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	159	634		81	479		180	802		71	585	
Arrive On Green	0.09	0.18	0.00	0.05	0.14	0.00	0.10	0.23	0.00	0.04	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	103	177	0	40	122	0	130	291	0	34	253	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	2.0	1.5	0.0	0.8	1.1	0.0	2.5	2.5	0.0	0.7	2.3	0.0
Cycle Q Clear(g_c), s	2.0	1.5	0.0	0.8	1.1	0.0	2.5	2.5	0.0	0.7	2.3	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	159	634		81	479		180	802		71	585	
V/C Ratio(X)	0.65	0.28		0.49	0.25		0.72	0.36		0.48	0.43	
Avail Cap(c_a), veh/h	1020	3027		572	2134		1219	4913		522	3523	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.6	12.6	0.0	16.5	13.7	0.0	15.5	11.6	0.0	16.7	13.3	0.0
Incr Delay (d2), s/veh	4.4	0.2	0.0	4.6	0.3	0.0	5.4	0.3	0.0	5.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.5	0.0	0.4	0.4	0.0	1.1	0.7	0.0	0.3	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	12.8	0.0	21.1	14.0	0.0	20.9	11.8	0.0	21.6	13.8	0.0
LnGrp LOS	C	B		C	B		C	B		C	B	
Approach Vol, veh/h		280			162			421			287	
Approach Delay, s/veh		15.5			15.8			14.6			14.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	12.6	6.1	10.9	8.1	10.4	7.7	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	49.5	11.5	30.5	24.5	35.5	20.5	21.5
Max Q Clear Time (g_c+I1), s	2.7	4.5	2.8	3.5	4.5	4.3	4.0	3.1
Green Ext Time (p_c), s	0.0	2.0	0.0	1.0	0.3	1.6	0.2	0.6

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	404	188	229	143	195
v/c Ratio	0.48	0.45	0.11	0.38	0.40
Control Delay	15.2	19.8	4.6	20.2	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	19.8	4.6	20.2	6.3
Queue Length 50th (ft)	38	41	11	31	0
Queue Length 95th (ft)	87	106	27	87	43
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	2523	1395	3505	1454	1334
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.13	0.07	0.10	0.15

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	250	121	173	211	132	179
Future Volume (veh/h)	250	121	173	211	132	179
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	272	132	188	229	143	195
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	558	263	259	1850	351	312
Arrive On Green	0.24	0.24	0.15	0.52	0.20	0.20
Sat Flow, veh/h	2417	1097	1767	3618	1767	1572
Grp Volume(v), veh/h	204	200	188	229	143	195
Grp Sat Flow(s),veh/h/ln	1763	1658	1767	1763	1767	1572
Q Serve(g_s), s	3.2	3.4	3.3	1.1	2.3	3.7
Cycle Q Clear(g_c), s	3.2	3.4	3.3	1.1	2.3	3.7
Prop In Lane		0.66	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	423	398	259	1850	351	312
V/C Ratio(X)	0.48	0.50	0.73	0.12	0.41	0.62
Avail Cap(c_a), veh/h	1815	1707	1928	7963	2036	1812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.6	10.7	13.3	3.9	11.4	11.9
Incr Delay (d2), s/veh	0.9	1.0	3.9	0.0	0.8	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.0	1.2	0.2	0.7	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.5	11.7	17.1	4.0	12.1	14.0
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	404			417	338	
Approach Delay, s/veh	11.6			9.9	13.2	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		11.0	9.3	12.3				21.6
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		37.5	35.5	33.5				73.5
Max Q Clear Time (g_c+I1), s		5.7	5.3	5.4				3.1
Green Ext Time (p_c), s		1.1	0.5	2.5				1.6

Intersection Summary			
HCM 6th Ctrl Delay			11.4
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	24	821	60	375	241	102	7
v/c Ratio	0.11	0.61	0.23	0.24	0.56	0.15	0.01
Control Delay	33.6	17.4	31.7	12.1	25.8	0.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	17.4	31.7	12.1	25.8	0.5	0.0
Queue Length 50th (ft)	8	121	20	31	75	0	0
Queue Length 95th (ft)	37	244	68	101	184	0	0
Internal Link Dist (ft)		424		851		1161	269
Turn Bay Length (ft)	125		125		75		
Base Capacity (vph)	297	2733	436	2945	1085	1287	1328
Starvation Cap Reductn	0	6	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.30	0.14	0.13	0.22	0.08	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	576	179	55	344	1	222	0	94	0	0	6
Future Volume (veh/h)	22	576	179	55	344	1	222	0	94	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	626	195	60	374	1	241	0	102	0	0	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	51	1008	314	106	1485	4	500	0	376	171	0	376
Arrive On Green	0.03	0.38	0.38	0.06	0.41	0.41	0.24	0.00	0.24	0.00	0.00	0.24
Sat Flow, veh/h	1767	2647	823	1767	3607	10	1397	0	1572	1282	0	1572
Grp Volume(v), veh/h	24	417	404	60	183	192	241	0	102	0	0	7
Grp Sat Flow(s),veh/h/ln	1767	1763	1707	1767	1763	1854	1397	0	1572	1282	0	1572
Q Serve(g_s), s	0.6	8.1	8.1	1.4	2.9	2.9	6.7	0.0	2.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.6	8.1	8.1	1.4	2.9	2.9	6.9	0.0	2.2	0.0	0.0	0.1
Prop In Lane	1.00		0.48	1.00		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	51	671	650	106	726	763	500	0	376	171	0	376
V/C Ratio(X)	0.47	0.62	0.62	0.57	0.25	0.25	0.48	0.00	0.27	0.00	0.00	0.02
Avail Cap(c_a), veh/h	356	2029	1965	524	2196	2309	1675	0	1698	1249	0	1698
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	20.1	10.6	10.6	19.3	8.1	8.1	14.9	0.0	13.0	0.0	0.0	12.3
Incr Delay (d2), s/veh	6.5	0.9	1.0	4.7	0.2	0.2	0.7	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.4	2.4	0.6	0.8	0.8	1.9	0.0	0.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	11.5	11.6	24.0	8.3	8.3	15.6	0.0	13.4	0.0	0.0	12.3
LnGrp LOS	C	B	B	C	A	A	B	A	B	A	A	B
Approach Vol, veh/h		845			435			343			7	
Approach Delay, s/veh		12.0			10.5			15.0			12.3	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.6	7.0	20.5		14.6	5.7	21.8				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		45.5	12.5	48.5		45.5	8.5	52.5				
Max Q Clear Time (g_c+I1), s		8.9	3.4	10.1		2.1	2.6	4.9				
Green Ext Time (p_c), s		1.4	0.1	5.9		0.0	0.0	2.3				

Intersection Summary		
HCM 6th Ctrl Delay		12.2
HCM 6th LOS		B

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	622	471	661	378	130	233	1161
v/c Ratio	0.78	0.26	0.79	0.63	0.35	0.40	0.81
Control Delay	43.3	14.5	37.6	44.2	10.2	39.1	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	14.5	37.6	44.2	10.2	39.1	7.5
Queue Length 50th (ft)	185	79	165	115	0	68	0
Queue Length 95th (ft)	304	149	#296	196	54	114	57
Internal Link Dist (ft)		852	424	1178			
Turn Bay Length (ft)	275				450	100	300
Base Capacity (vph)	1014	2186	997	817	465	1014	1638
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.22	0.66	0.46	0.28	0.23	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	572	433	0	0	366	242	0	348	120	214	0	1068
Future Volume (veh/h)	572	433	0	0	366	242	0	348	120	214	0	1068
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	0	1856	1856	1856	0	1856
Adj Flow Rate, veh/h	622	471	0	0	398	263	0	378	130	233	0	1161
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	3	3	0	3
Cap, veh/h	780	1920	0	0	518	339	0	570	254	353	0	0
Arrive On Green	0.23	0.54	0.00	0.00	0.25	0.25	0.00	0.16	0.16	0.10	0.00	0.00
Sat Flow, veh/h	3428	3618	0	0	2136	1335	0	3618	1572	3428	233	
Grp Volume(v), veh/h	622	471	0	0	343	318	0	378	130	233	32.7	
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1763	1615	0	1763	1572	1714	C	
Q Serve(g_s), s	12.1	5.0	0.0	0.0	12.8	13.0	0.0	7.1	5.4	4.6		
Cycle Q Clear(g_c), s	12.1	5.0	0.0	0.0	12.8	13.0	0.0	7.1	5.4	4.6		
Prop In Lane	1.00		0.00	0.00		0.83	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	780	1920	0	0	447	410	0	570	254	353		
V/C Ratio(X)	0.80	0.25	0.00	0.00	0.77	0.78	0.00	0.66	0.51	0.66		
Avail Cap(c_a), veh/h	1330	2859	0	0	634	581	0	1069	477	1330		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	25.8	8.5	0.0	0.0	24.5	24.6	0.0	27.9	27.2	30.6		
Incr Delay (d2), s/veh	1.9	0.1	0.0	0.0	3.6	4.3	0.0	1.3	1.6	2.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.8	1.6	0.0	0.0	5.4	5.1	0.0	3.0	2.0	1.9		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	8.5	0.0	0.0	28.1	28.9	0.0	29.2	28.7	32.7		
LnGrp LOS	C	A	A	A	C	C	A	C	C	C		
Approach Vol, veh/h		1093			661			508				
Approach Delay, s/veh		19.5			28.5			29.1				
Approach LOS		B			C			C				
Timer - Assigned Phs	1	2		4			7	8				
Phs Duration (G+Y+Rc), s	11.8	16.0		43.1			20.6	22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s	27.5	21.5		57.5			27.5	25.5				
Max Q Clear Time (g_c+I1), s	6.6	9.1		7.0			14.1	15.0				
Green Ext Time (p_c), s	0.7	2.3		3.4			2.0	3.0				
Intersection Summary												
HCM 6th Ctrl Delay			25.1									
HCM 6th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL	SWR
Lane Group Flow (vph)	92	772	575	509	1057	157	155	99	165	251
v/c Ratio	0.53	0.68	0.69	0.76	0.69	0.63	0.59	0.29	0.63	0.72
Control Delay	59.6	33.9	10.2	47.8	26.6	55.4	53.0	5.3	54.5	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.6	33.9	10.2	47.8	26.6	55.4	53.0	5.3	54.5	33.1
Queue Length 50th (ft)	58	228	39	162	297	98	96	0	103	71
Queue Length 95th (ft)	125	340	173	256	432	187	183	23	192	177
Internal Link Dist (ft)		693			852		265		1072	
Turn Bay Length (ft)	150		200	285		125		125		
Base Capacity (vph)	211	1452	936	837	1837	340	358	413	376	443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.53	0.61	0.61	0.58	0.46	0.43	0.24	0.44	0.57

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	85	710	529	468	786	187	144	143	91	152	0	210
Future Volume (vph)	85	710	529	468	786	187	144	143	91	152	0	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	1568	3400	3404		1752	1845	1568		1752	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	1568	3400	3404		1752	1845	1568		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	772	575	509	854	203	157	155	99	165	0	228
RTOR Reduction (vph)	0	0	327	0	0	0	0	0	85	0	0	116
Lane Group Flow (vph)	92	772	248	509	1057	0	157	155	14	0	165	135
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Prot	Prot	Prot	Prot
Protected Phases	5	2		1	6		4	4	4	8	8	8
Permitted Phases			2									
Actuated Green, G (s)	8.0	33.3	33.3	19.7	45.0		14.2	14.2	14.2		14.8	14.8
Effective Green, g (s)	8.0	33.3	33.3	19.7	45.0		14.2	14.2	14.2		14.8	14.8
Actuated g/C Ratio	0.08	0.33	0.33	0.20	0.45		0.14	0.14	0.14		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	140	1167	522	669	1531		248	261	222		259	232
v/s Ratio Prot	0.05	0.22		c0.15	c0.31		c0.09	0.08	0.01		c0.09	0.09
v/s Ratio Perm			0.16									
v/c Ratio	0.66	0.66	0.48	0.76	0.69		0.63	0.59	0.06		0.64	0.58
Uniform Delay, d1	44.7	28.5	26.4	37.9	21.9		40.4	40.2	37.1		40.1	39.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	10.6	1.4	0.7	5.1	1.4		5.2	3.6	0.1		5.1	3.7
Delay (s)	55.3	30.0	27.1	43.0	23.3		45.6	43.8	37.3		45.1	43.4
Level of Service	E	C	C	D	C		D	D	D		D	D
Approach Delay (s)		30.4			29.7			42.9			44.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	21
Future Volume (vph)	21
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	23
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	99	275	385	33	51	382
v/c Ratio	0.22	0.45	0.34	0.06	0.13	0.25
Control Delay	13.6	5.4	10.9	5.8	14.5	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	5.4	10.9	5.8	14.5	5.6
Queue Length 50th (ft)	9	0	17	0	5	16
Queue Length 95th (ft)	52	45	71	14	33	36
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1737	1557	3316	1485	1415	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.18	0.12	0.02	0.04	0.11

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Traffic Volume (veh/h)	91	253	354	30	47	351	
Future Volume (veh/h)	91	253	354	30	47	351	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No		No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	
Adj Flow Rate, veh/h	99	275	385	33	51	382	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	3	3	3	3	3	3	
Cap, veh/h	434	386	798	356	249	1751	
Arrive On Green	0.25	0.25	0.23	0.23	0.14	0.50	
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618	
Grp Volume(v), veh/h	99	275	385	33	51	382	
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763	
Q Serve(g_s), s	1.6	5.6	3.3	0.6	0.9	2.1	
Cycle Q Clear(g_c), s	1.6	5.6	3.3	0.6	0.9	2.1	
Prop In Lane	1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	434	386	798	356	249	1751	
V/C Ratio(X)	0.23	0.71	0.48	0.09	0.20	0.22	
Avail Cap(c_a), veh/h	2254	2005	3789	1690	1241	6719	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	10.5	12.0	11.7	10.7	13.3	5.0	
Incr Delay (d2), s/veh	0.3	2.4	0.5	0.1	0.4	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.4	1.6	0.9	0.2	0.3	0.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	10.8	14.5	12.2	10.8	13.7	5.0	
LnGrp LOS	B	B	B	B	B	A	
Approach Vol, veh/h	374		418			433	
Approach Delay, s/veh	13.5		12.1			6.0	
Approach LOS	B		B			A	
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	9.4	12.4				21.8	13.1
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	24.5	37.5				66.5	44.5
Max Q Clear Time (g_c+I1), s	2.9	5.3				4.1	7.6
Green Ext Time (p_c), s	0.1	2.6				2.6	1.2
Intersection Summary							
HCM 6th Ctrl Delay			10.4				
HCM 6th LOS			B				

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	86	197	108	114	162	76	899	161	116	391
v/c Ratio	0.43	0.62	0.48	0.33	0.38	0.40	0.72	0.58	0.14	0.42
Control Delay	51.4	46.2	50.6	39.2	9.2	51.4	29.6	48.9	19.7	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	46.2	50.6	39.2	9.2	51.4	29.6	48.9	19.7	3.7
Queue Length 50th (ft)	48	104	59	58	0	42	230	88	42	0
Queue Length 95th (ft)	118	215	139	130	57	108	378	189	93	57
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	275	502	333	571	597	260	1860	428	1163	1133
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.39	0.32	0.20	0.27	0.29	0.48	0.38	0.10	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	151	30	99	105	149	70	676	151	148	107	360
Future Volume (veh/h)	79	151	30	99	105	149	70	676	151	148	107	360
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	86	164	33	108	114	162	76	735	164	161	116	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	112	226	45	141	311	263	104	1033	230	209	779	660
Arrive On Green	0.06	0.15	0.15	0.08	0.17	0.17	0.06	0.36	0.36	0.12	0.42	0.42
Sat Flow, veh/h	1767	1500	302	1767	1856	1572	1767	2864	639	1767	1856	1572
Grp Volume(v), veh/h	86	0	197	108	114	162	76	452	447	161	116	391
Grp Sat Flow(s),veh/h/ln	1767	0	1801	1767	1856	1572	1767	1763	1741	1767	1856	1572
Q Serve(g_s), s	3.0	0.0	6.5	3.7	3.4	5.9	2.6	13.7	13.7	5.5	2.4	11.9
Cycle Q Clear(g_c), s	3.0	0.0	6.5	3.7	3.4	5.9	2.6	13.7	13.7	5.5	2.4	11.9
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	112	0	271	141	311	263	104	636	628	209	779	660
V/C Ratio(X)	0.77	0.00	0.73	0.76	0.37	0.62	0.73	0.71	0.71	0.77	0.15	0.59
Avail Cap(c_a), veh/h	365	0	654	442	755	640	345	1255	1240	568	1555	1318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	0.0	25.1	27.9	22.9	23.9	28.7	17.0	17.0	26.5	11.1	13.9
Incr Delay (d2), s/veh	10.6	0.0	3.7	8.3	0.7	2.3	9.4	1.5	1.5	6.0	0.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.9	1.8	1.4	2.2	1.3	5.2	5.1	2.5	0.9	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.2	0.0	28.8	36.2	23.6	26.3	38.0	18.5	18.5	32.5	11.2	14.7
LnGrp LOS	D	A	C	D	C	C	D	B	B	C	B	B
Approach Vol, veh/h		283			384			975			668	
Approach Delay, s/veh		31.9			28.3			20.0			18.4	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	26.8	9.5	13.8	8.1	30.5	8.4	14.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	19.9	44.1	15.5	22.5	12.1	51.9	12.8	25.2				
Max Q Clear Time (g_c+I1), s	7.5	15.7	5.7	8.5	4.6	13.9	5.0	7.9				
Green Ext Time (p_c), s	0.3	6.7	0.2	0.9	0.1	2.2	0.1	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			22.4									
HCM 6th LOS			C									

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	362	927	999	90	1395	279
v/c Ratio	0.28	0.80	0.55	0.11	0.77	0.18
Control Delay	22.8	29.3	18.0	3.5	23.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	29.3	18.0	3.5	23.2	0.2
Queue Length 50th (ft)	75	230	201	0	333	0
Queue Length 95th (ft)	151	443	365	27	594	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	2119	1780	2739	1245	2739	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.52	0.36	0.07	0.51	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	333	0	853	0	919	83	0	1283	257
Future Volume (veh/h)	0	0	0	333	0	853	0	919	83	0	1283	257
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				362	0	927	0	999	90	0	1395	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1352	0	1092	0	1777	793	0	1777	
Arrive On Green				0.39	0.00	0.39	0.00	0.50	0.50	0.00	0.50	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				362	0	927	0	999	90	0	1395	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				6.3	0.0	27.1	0.0	17.4	2.7	0.0	28.8	0.0
Cycle Q Clear(g_c), s				6.3	0.0	27.1	0.0	17.4	2.7	0.0	28.8	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1352	0	1092	0	1777	793	0	1777	
V/C Ratio(X)				0.27	0.00	0.85	0.00	0.56	0.11	0.00	0.78	
Avail Cap(c_a), veh/h				2183	0	1762	0	2960	1320	0	2960	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.2	0.0	24.5	0.0	15.2	11.6	0.0	18.1	0.0
Incr Delay (d2), s/veh				0.1	0.0	2.3	0.0	0.3	0.1	0.0	0.8	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.4	0.0	8.4	0.0	6.2	0.9	0.0	10.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.3	0.0	26.8	0.0	15.5	11.6	0.0	18.8	0.0
LnGrp LOS				B	A	C	A	B	B	A	B	
Approach Vol, veh/h					1289			1089			1395	
Approach Delay, s/veh					24.4			15.2			18.8	
Approach LOS					C			B			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		49.2				49.2		39.5				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		74.5				74.5		56.5				
Max Q Clear Time (g_c+I1), s		19.4				30.8		29.1				
Green Ext Time (p_c), s		8.9				13.9		5.9				

Intersection Summary			
HCM 6th Ctrl Delay			19.7
HCM 6th LOS			B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	215	737	583	97	870	327	139	32	37	130
v/c Ratio	0.57	0.51	0.37	0.38	0.59	0.51	0.39	0.17	0.19	0.25
Control Delay	34.9	20.1	0.7	38.0	24.8	32.3	24.7	39.7	39.4	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	20.1	0.7	38.0	24.8	32.3	24.7	39.7	39.4	13.3
Queue Length 50th (ft)	90	144	0	42	126	71	36	14	16	23
Queue Length 95th (ft)	197	250	0	108	215	142	108	49	54	73
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	776	2403	1568	422	2448	1083	647	503	616	860
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.31	0.37	0.23	0.36	0.30	0.21	0.06	0.06	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	678	536	89	754	46	301	55	73	29	34	120
Future Volume (veh/h)	198	678	536	89	754	46	301	55	73	29	34	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	215	737	0	97	820	50	327	60	0	32	37	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	276	1274		127	1353	82	487	302		155	201	416
Arrive On Green	0.16	0.36	0.00	0.07	0.28	0.28	0.14	0.16	0.00	0.09	0.11	0.11
Sat Flow, veh/h	1767	3526	1572	1767	4882	297	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	215	737	0	97	566	304	327	60	0	32	37	130
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1802	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	6.6	9.6	0.0	3.1	8.3	8.3	5.1	1.6	0.0	1.0	1.0	3.8
Cycle Q Clear(g_c), s	6.6	9.6	0.0	3.1	8.3	8.3	5.1	1.6	0.0	1.0	1.0	3.8
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	276	1274		127	936	499	487	302		155	201	416
V/C Ratio(X)	0.78	0.58		0.77	0.61	0.61	0.67	0.20		0.21	0.18	0.31
Avail Cap(c_a), veh/h	885	2758		481	1870	998	1235	766		575	701	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	14.7	0.0	25.9	17.9	17.9	23.1	20.6	0.0	24.1	23.1	16.8
Incr Delay (d2), s/veh	4.7	0.4	0.0	9.2	0.6	1.2	1.6	0.3	0.0	0.6	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.2	0.0	1.5	2.8	3.1	2.0	0.7	0.0	0.4	0.4	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	15.1	0.0	35.1	18.5	19.1	24.7	20.9	0.0	24.8	23.5	17.2
LnGrp LOS	C	B		D	B	B	C	C		C	C	B
Approach Vol, veh/h		952			967			387			199	
Approach Delay, s/veh		18.0			20.4			24.2			19.6	
Approach LOS		B			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	13.7	8.6	25.1	12.6	10.7	13.4	20.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	23.5	15.5	44.5	20.5	21.5	28.5	31.5
Max Q Clear Time (g_c+I1), s	3.0	3.6	5.1	11.6	7.1	5.8	8.6	10.3
Green Ext Time (p_c), s	0.0	0.2	0.1	5.3	1.0	0.5	0.5	5.4

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	24	508	300	20	666	275	8	2	4
v/c Ratio	0.08	0.35	0.37	0.06	0.47	0.31	0.01	0.01	0.01
Control Delay	20.9	10.2	3.4	21.0	11.2	15.5	0.0	22.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	10.2	3.4	21.0	11.2	15.5	0.0	22.5	0.0
Queue Length 50th (ft)	4	27	0	3	37	19	0	0	0
Queue Length 95th (ft)	30	124	47	27	168	86	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	537	3289	1490	486	3279	2433	1452	383	1003
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.15	0.20	0.04	0.20	0.11	0.01	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	467	276	18	612	1	253	0	7	2	0	4
Future Volume (veh/h)	22	467	276	18	612	1	253	0	7	2	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	508	0	20	665	1	275	0	8	2	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	52	1146		44	1158	2	493	296	250	5	0	28
Arrive On Green	0.03	0.33	0.00	0.03	0.32	0.32	0.14	0.00	0.16	0.00	0.00	0.02
Sat Flow, veh/h	1767	3526	1572	1767	3612	5	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	24	508	0	20	325	341	275	0	8	2	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1855	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	0.5	4.2	0.0	0.4	5.7	5.7	2.8	0.0	0.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.5	4.2	0.0	0.4	5.7	5.7	2.8	0.0	0.2	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	52	1146		44	565	595	493	296	250	5	0	28
V/C Ratio(X)	0.46	0.44		0.45	0.57	0.57	0.56	0.00	0.03	0.41	0.00	0.14
Avail Cap(c_a), veh/h	503	4634		455	2269	2387	2276	1835	1555	359	0	831
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.6	9.8	0.0	17.7	10.4	10.4	14.7	0.0	13.1	18.4	0.0	17.8
Incr Delay (d2), s/veh	6.2	0.3	0.0	7.0	0.9	0.9	1.0	0.0	0.1	47.5	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.1	0.0	0.2	1.6	1.7	0.9	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	10.1	0.0	24.7	11.4	11.3	15.7	0.0	13.2	65.8	0.0	20.1
LnGrp LOS	C	B		C	B	B	B	A	B	E	A	C
Approach Vol, veh/h		532			686			283			6	
Approach Delay, s/veh		10.7			11.7			15.6			35.3	
Approach LOS		B			B			B			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.6	10.4	5.4	16.5	9.8	5.2	5.6	16.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	36.5	9.5	48.5	24.5	19.5	10.5	47.5				
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.4	6.2	4.8	2.1	2.5	7.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	3.5	0.9	0.0	0.0	4.2				
Intersection Summary												
HCM 6th Ctrl Delay			12.2									
HCM 6th LOS			B									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	395	88	11	410	257	55
v/c Ratio	0.34	0.15	0.03	0.31	0.26	0.11
Control Delay	9.1	3.8	13.0	6.5	10.2	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	3.8	13.0	6.5	10.2	5.1
Queue Length 50th (ft)	17	0	1	17	11	0
Queue Length 95th (ft)	68	22	12	39	50	19
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1323	3505	3326	1535
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.06	0.01	0.12	0.08	0.04

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	363	81	10	377	236	51
Future Volume (veh/h)	363	81	10	377	236	51
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	395	88	11	410	257	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	891	397	277	1954	534	245
Arrive On Green	0.25	0.25	0.16	0.55	0.16	0.16
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	395	88	11	410	257	55
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	2.9	1.4	0.2	1.8	2.1	0.9
Cycle Q Clear(g_c), s	2.9	1.4	0.2	1.8	2.1	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	891	397	277	1954	534	245
V/C Ratio(X)	0.44	0.22	0.04	0.21	0.48	0.22
Avail Cap(c_a), veh/h	5280	2355	1167	8119	4362	2001
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	9.2	11.1	3.5	12.0	11.5
Incr Delay (d2), s/veh	0.3	0.3	0.1	0.1	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.3	0.0	0.1	0.6	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.1	9.5	11.2	3.5	12.6	11.9
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	483			421	312	
Approach Delay, s/veh	10.0			3.7	12.5	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.3	9.4	12.3				21.7
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		39.5	20.5	46.5				71.5
Max Q Clear Time (g_c+I1), s		4.1	2.2	4.9				3.8
Green Ext Time (p_c), s		1.1	0.0	2.9				2.8

Intersection Summary		
HCM 6th Ctrl Delay		8.5
HCM 6th LOS		A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	356	68	543	16	2	25	71	26
v/c Ratio	0.05	0.18	0.13	0.22	0.01	0.00	0.05	0.12	0.05
Control Delay	16.7	10.2	15.0	6.1	0.5	14.0	8.6	14.1	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	10.2	15.0	6.1	0.5	14.0	8.6	14.1	7.9
Queue Length 50th (ft)	4	32	12	25	0	0	1	12	0
Queue Length 95th (ft)	22	66	43	94	2	5	15	42	15
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	1088	3492	1287	3505	1568	1645	1430	1645	1411
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.10	0.05	0.15	0.01	0.00	0.02	0.04	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	323	5	63	500	15	2	3	20	65	1	23
Future Volume (veh/h)	22	323	5	63	500	15	2	3	20	65	1	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	351	5	68	543	16	2	3	22	71	1	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1100	16	131	1243	555	403	22	159	404	7	171
Arrive On Green	0.03	0.31	0.31	0.07	0.35	0.35	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3559	51	1767	3526	1572	1374	192	1410	1375	61	1521
Grp Volume(v), veh/h	24	174	182	68	543	16	2	0	25	71	0	26
Grp Sat Flow(s),veh/h/ln	1767	1763	1846	1767	1763	1572	1374	0	1602	1375	0	1582
Q Serve(g_s), s	0.4	2.0	2.0	1.0	3.2	0.2	0.0	0.0	0.4	1.3	0.0	0.4
Cycle Q Clear(g_c), s	0.4	2.0	2.0	1.0	3.2	0.2	0.4	0.0	0.4	1.7	0.0	0.4
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	54	545	571	131	1243	555	403	0	180	404	0	178
V/C Ratio(X)	0.44	0.32	0.32	0.52	0.44	0.03	0.00	0.00	0.14	0.18	0.00	0.15
Avail Cap(c_a), veh/h	1023	3194	3345	1551	7441	3319	2019	0	2064	2022	0	2039
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.8	7.1	7.1	11.9	6.6	5.7	10.9	0.0	10.7	11.5	0.0	10.7
Incr Delay (d2), s/veh	5.6	0.3	0.3	3.2	0.2	0.0	0.0	0.0	0.3	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.5	0.4	0.7	0.0	0.0	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	7.4	7.4	15.1	6.9	5.7	10.9	0.0	11.1	11.7	0.0	11.1
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		380			627			27			97	
Approach Delay, s/veh		8.1			7.7			11.0			11.5	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.5	6.5	12.8		7.5	5.3	13.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		34.5	23.5	48.5		34.5	15.5	56.5				
Max Q Clear Time (g_c+I1), s		2.4	3.0	4.0		3.7	2.4	5.2				
Green Ext Time (p_c), s		0.1	0.1	2.3		0.3	0.0	4.3				

Intersection Summary			
HCM 6th Ctrl Delay			8.3
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	236	214	349	28	23	121	58	14	20
v/c Ratio	0.16	0.33	0.45	0.21	0.11	0.08	0.34	0.19	0.04	0.05
Control Delay	24.9	20.2	21.7	11.8	25.5	25.2	8.0	24.6	22.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	20.2	21.7	11.8	25.5	25.2	8.0	24.6	22.0	0.2
Queue Length 50th (ft)	13	32	59	36	8	7	0	17	3	0
Queue Length 95th (ft)	45	73	133	77	32	28	36	52	19	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	528	1782	1258	2791	824	1097	987	908	1154	1031
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.13	0.17	0.13	0.03	0.02	0.12	0.06	0.01	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	182	35	197	223	98	26	21	111	53	13	18
Future Volume (veh/h)	42	182	35	197	223	98	26	21	111	53	13	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	198	38	214	242	107	28	23	121	58	14	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	89	423	80	290	617	265	207	263	223	164	218	185
Arrive On Green	0.05	0.14	0.14	0.16	0.26	0.26	0.12	0.14	0.14	0.09	0.12	0.12
Sat Flow, veh/h	1767	2960	558	1767	2403	1030	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	46	116	120	214	176	173	28	23	121	58	14	20
Grp Sat Flow(s),veh/h/ln	1767	1763	1755	1767	1763	1670	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	1.0	2.4	2.5	4.5	3.2	3.4	0.6	0.4	2.8	1.2	0.3	0.4
Cycle Q Clear(g_c), s	1.0	2.4	2.5	4.5	3.2	3.4	0.6	0.4	2.8	1.2	0.3	0.4
Prop In Lane	1.00		0.32	1.00		0.62	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	89	252	251	290	453	429	207	263	223	164	218	185
V/C Ratio(X)	0.52	0.46	0.48	0.74	0.39	0.40	0.14	0.09	0.54	0.35	0.06	0.11
Avail Cap(c_a), veh/h	562	965	961	1507	1908	1807	877	1205	1021	967	1299	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	15.4	15.5	15.6	12.0	12.1	15.6	14.6	15.7	16.7	15.4	15.5
Incr Delay (d2), s/veh	4.6	1.3	1.4	3.7	0.5	0.6	0.3	0.1	2.1	1.3	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.9	0.9	1.8	1.1	1.1	0.2	0.2	1.0	0.5	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	16.8	16.9	19.3	12.6	12.7	15.9	14.8	17.7	18.0	15.5	15.7
LnGrp LOS	C	B	B	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		282			563			172			92	
Approach Delay, s/veh		17.8			15.2			17.0			17.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	10.1	10.9	10.1	9.1	9.1	6.5	14.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	25.5	33.5	21.5	19.5	27.5	12.5	42.5
Max Q Clear Time (g_c+I1), s	3.2	4.8	6.5	4.5	2.6	2.4	3.0	5.4
Green Ext Time (p_c), s	0.1	0.4	0.6	1.2	0.0	0.1	0.0	2.3

Intersection Summary		
HCM 6th Ctrl Delay		16.3
HCM 6th LOS		B

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	152	15	507	47	247
v/c Ratio	0.16	0.04	0.30	0.10	0.12
Control Delay	13.3	8.9	8.1	14.9	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	8.9	8.1	14.9	4.3
Queue Length 50th (ft)	8	0	18	5	10
Queue Length 95th (ft)	37	12	76	32	21
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2952	1239	3340	1261	3505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.15	0.04	0.07

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	138	16	321	145	43	227
Future Volume (veh/h)	138	16	321	145	43	227
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	17	349	158	47	247
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	464	206	762	339	97	1905
Arrive On Green	0.13	0.13	0.32	0.32	0.05	0.54
Sat Flow, veh/h	3534	1572	2466	1055	1767	3618
Grp Volume(v), veh/h	150	17	258	249	47	247
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1666	1767	1763
Q Serve(g_s), s	1.1	0.3	3.2	3.3	0.7	0.9
Cycle Q Clear(g_c), s	1.1	0.3	3.2	3.3	0.7	0.9
Prop In Lane	1.00	1.00		0.63	1.00	
Lane Grp Cap(c), veh/h	464	206	566	535	97	1905
V/C Ratio(X)	0.32	0.08	0.46	0.47	0.48	0.13
Avail Cap(c_a), veh/h	3805	1693	3571	3374	1387	10487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.8	10.5	7.4	7.4	12.6	3.1
Incr Delay (d2), s/veh	0.4	0.2	0.6	0.6	3.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.8	0.8	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.2	10.6	8.0	8.1	16.3	3.1
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	167		507			294
Approach Delay, s/veh	11.1		8.0			5.2
Approach LOS	B		A			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	6.0	13.3	19.3	8.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	55.5	81.5	29.5
Max Q Clear Time (g_c+I1), s	2.7	5.3	2.9	3.1
Green Ext Time (p_c), s	0.1	3.6	1.8	0.5

Intersection Summary	
HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	151	48	253	117	53
v/c Ratio	0.31	0.03	0.30	0.16	0.15
Control Delay	13.5	3.6	6.4	11.5	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	3.6	6.4	11.5	6.6
Queue Length 50th (ft)	24	1	6	7	0
Queue Length 95th (ft)	62	5	29	24	21
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1745	3505	2947	3053	1310
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.01	0.09	0.04	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	139	44	74	159	86	71
Future Volume (veh/h)	139	44	74	159	86	71
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	151	48	80	173	112	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	227	1811	371	331	482	214
Arrive On Green	0.13	0.51	0.21	0.21	0.14	0.14
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	151	48	80	173	112	57
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	2.1	0.2	1.0	2.5	0.7	0.8
Cycle Q Clear(g_c), s	2.1	0.2	1.0	2.5	0.7	0.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	227	1811	371	331	482	214
V/C Ratio(X)	0.67	0.03	0.22	0.52	0.23	0.27
Avail Cap(c_a), veh/h	2783	10761	2296	2048	4466	1987
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.7	3.1	8.4	9.0	9.9	10.0
Incr Delay (d2), s/veh	3.3	0.0	0.3	1.3	0.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.3	0.7	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.0	3.1	8.7	10.3	10.2	10.6
LnGrp LOS	B	A	A	B	B	B
Approach Vol, veh/h		199	253		169	
Approach Delay, s/veh		11.4	9.8		10.3	
Approach LOS		B	A		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				17.7		8.0	7.8	9.9
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				78.5		32.5	40.5	33.5
Max Q Clear Time (g_c+I1), s				2.2		2.8	4.1	4.5
Green Ext Time (p_c), s				0.3		0.6	0.4	1.6

Intersection Summary			
HCM 6th Ctrl Delay			10.4
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	7	118	3	28	201	238	9	313
v/c Ratio	0.09	0.02	0.32	0.01	0.10	0.41	0.10	0.03	0.36
Control Delay	21.5	20.8	7.1	22.7	14.2	17.8	6.5	22.2	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	20.8	7.1	22.7	14.2	17.8	6.5	22.2	16.1
Queue Length 50th (ft)	5	1	0	1	1	37	7	2	29
Queue Length 95th (ft)	30	12	33	8	23	121	53	15	86
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	485	1213	1077	346	980	1532	3448	393	2687
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.11	0.01	0.03	0.13	0.07	0.02	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	6	109	3	6	19	185	215	4	8	246	42
Future Volume (veh/h)	24	6	109	3	6	19	185	215	4	8	246	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	26	7	118	3	7	21	201	234	4	9	267	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	258	219	7	46	137	276	1175	20	21	565	96
Arrive On Green	0.03	0.14	0.14	0.00	0.11	0.11	0.16	0.33	0.33	0.01	0.19	0.19
Sat Flow, veh/h	1767	1856	1572	1767	409	1226	1767	3547	61	1767	3014	512
Grp Volume(v), veh/h	26	7	118	3	0	28	201	116	122	9	155	158
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1635	1767	1763	1845	1767	1763	1763
Q Serve(g_s), s	0.5	0.1	2.4	0.1	0.0	0.5	3.8	1.7	1.7	0.2	2.7	2.8
Cycle Q Clear(g_c), s	0.5	0.1	2.4	0.1	0.0	0.5	3.8	1.7	1.7	0.2	2.7	2.8
Prop In Lane	1.00		1.00	1.00		0.75	1.00		0.03	1.00		0.29
Lane Grp Cap(c), veh/h	56	258	219	7	0	182	276	584	611	21	330	330
V/C Ratio(X)	0.46	0.03	0.54	0.41	0.00	0.15	0.73	0.20	0.20	0.43	0.47	0.48
Avail Cap(c_a), veh/h	529	1350	1144	378	0	1049	1840	3042	3183	428	1634	1635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	13.0	14.0	17.4	0.0	14.1	14.1	8.4	8.4	17.2	12.7	12.7
Incr Delay (d2), s/veh	5.8	0.0	2.1	33.5	0.0	0.4	3.7	0.2	0.2	13.0	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.8	0.1	0.0	0.2	1.4	0.4	0.5	0.1	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	13.1	16.1	50.9	0.0	14.5	17.8	8.6	8.6	30.2	13.7	13.8
LnGrp LOS	C	B	B	D	A	B	B	A	A	C	B	B
Approach Vol, veh/h		151			31			439			322	
Approach Delay, s/veh		17.1			18.0			12.8			14.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.9	16.1	4.6	9.4	10.0	11.1	5.6	8.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.5	60.5	7.5	25.5	36.5	32.5	10.5	22.5
Max Q Clear Time (g_c+I1), s	2.2	3.7	2.1	4.4	5.8	4.8	2.5	2.5
Green Ext Time (p_c), s	0.0	1.4	0.0	0.4	0.6	1.8	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	14.1
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	723	120	269	422	302	165	282
v/c Ratio	0.57	0.77	0.56	0.33	0.80	0.33	0.60	0.58
Control Delay	49.8	32.3	53.1	31.3	43.2	27.8	48.9	30.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	32.3	53.1	31.3	43.2	27.8	48.9	30.2
Queue Length 50th (ft)	80	166	69	65	232	72	94	51
Queue Length 95th (ft)	163	281	147	125	389	123	183	105
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	359	1174	271	969	773	1570	407	896
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.62	0.44	0.28	0.55	0.19	0.41	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	375	290	110	212	36	388	236	41	152	157	102
Future Volume (veh/h)	130	375	290	110	212	36	388	236	41	152	157	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	141	408	0	120	230	0	422	257	0	165	171	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	186	671		157	614		504	923		217	349	
Arrive On Green	0.11	0.19	0.00	0.09	0.17	0.00	0.29	0.26	0.00	0.12	0.10	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	141	408	0	120	230	0	422	257	0	165	171	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	4.2	5.7	0.0	3.6	3.1	0.0	12.0	3.1	0.0	4.8	2.5	0.0
Cycle Q Clear(g_c), s	4.2	5.7	0.0	3.6	3.1	0.0	12.0	3.1	0.0	4.8	2.5	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	186	671		157	614		504	923		217	349	
V/C Ratio(X)	0.76	0.61		0.76	0.37		0.84	0.28		0.76	0.49	
Avail Cap(c_a), veh/h	591	1879		446	1589		1272	2617		671	1417	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.3	19.8	0.0	23.8	19.5	0.0	17.9	15.7	0.0	22.7	22.8	0.0
Incr Delay (d2), s/veh	6.3	0.9	0.0	7.5	0.4	0.0	3.8	0.2	0.0	5.5	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.1	0.0	1.7	1.2	0.0	4.7	1.1	0.0	2.1	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	20.7	0.0	31.4	19.9	0.0	21.7	15.9	0.0	28.2	23.9	0.0
LnGrp LOS	C	C		C	B		C	B		C	C	
Approach Vol, veh/h		549			350			679			336	
Approach Delay, s/veh		23.0			23.8			19.5			26.0	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	18.5	9.2	14.7	19.8	9.8	10.1	13.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.3	39.7	13.5	28.5	38.5	21.5	17.9	24.1
Max Q Clear Time (g_c+I1), s	6.8	5.1	5.6	7.7	14.0	4.5	6.2	5.1
Green Ext Time (p_c), s	0.3	1.7	0.2	2.5	1.3	0.8	0.3	1.3

Intersection Summary	
HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	613	372	388	282	454
v/c Ratio	0.68	0.71	0.18	0.63	0.62
Control Delay	28.8	34.5	7.0	35.0	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	34.5	7.0	35.0	7.0
Queue Length 50th (ft)	118	154	36	116	0
Queue Length 95th (ft)	249	334	78	262	79
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1410	965	3118	916	1036
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.39	0.12	0.31	0.44

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	373	191	342	357	259	418
Future Volume (veh/h)	373	191	342	357	259	418
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	405	208	372	388	282	454
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	544	276	431	1924	586	521
Arrive On Green	0.24	0.24	0.24	0.55	0.33	0.33
Sat Flow, veh/h	2356	1148	1767	3618	1767	1572
Grp Volume(v), veh/h	314	299	372	388	282	454
Grp Sat Flow(s),veh/h/ln	1763	1649	1767	1763	1767	1572
Q Serve(g_s), s	12.1	12.3	14.8	4.1	9.3	19.9
Cycle Q Clear(g_c), s	12.1	12.3	14.8	4.1	9.3	19.9
Prop In Lane		0.70	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	424	396	431	1924	586	521
V/C Ratio(X)	0.74	0.75	0.86	0.20	0.48	0.87
Avail Cap(c_a), veh/h	710	664	953	3538	905	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	25.8	26.5	8.5	19.5	23.0
Incr Delay (d2), s/veh	2.6	2.9	5.2	0.1	0.6	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	4.8	6.4	1.4	3.7	7.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.3	28.7	31.8	8.5	20.1	29.6
LnGrp LOS	C	C	C	A	C	C
Approach Vol, veh/h	613			760	736	
Approach Delay, s/veh	28.5			19.9	26.0	
Approach LOS	C			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	28.8	22.4	22.1	44.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	37.5	39.5	29.5	73.5
Max Q Clear Time (g_c+I1), s	21.9	16.8	14.3	6.1
Green Ext Time (p_c), s	2.4	1.1	3.3	2.8

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	21	664	80	609	127	82
v/c Ratio	0.07	0.40	0.21	0.27	0.33	0.11
Control Delay	24.0	13.4	22.3	7.2	21.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	13.4	22.3	7.2	21.3	0.3
Queue Length 50th (ft)	5	75	20	36	30	0
Queue Length 95th (ft)	26	148	63	122	87	0
Internal Link Dist (ft)		424		851		1161
Turn Bay Length (ft)	125		125		75	
Base Capacity (vph)	566	3216	907	3447	1048	1278
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.21	0.09	0.18	0.12	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	521	90	74	559	1	117	0	75	0	0	0
Future Volume (veh/h)	19	521	90	74	559	1	117	0	75	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	21	566	98	80	608	1	127	0	82	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	47	1073	185	141	1481	2	465	0	210	229	248	0
Arrive On Green	0.03	0.36	0.36	0.08	0.41	0.41	0.13	0.00	0.13	0.00	0.00	0.00
Sat Flow, veh/h	1767	3006	519	1767	3611	6	1767	0	1572	1306	1856	0
Grp Volume(v), veh/h	21	331	333	80	297	312	127	0	82	0	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1762	1767	1763	1854	1767	0	1572	1306	1856	0
Q Serve(g_s), s	0.4	4.7	4.7	1.4	3.8	3.8	2.1	0.0	1.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	4.7	4.7	1.4	3.8	3.8	2.1	0.0	1.5	0.0	0.0	0.0
Prop In Lane	1.00		0.29	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	47	629	629	141	723	761	465	0	210	229	248	0
V/C Ratio(X)	0.45	0.53	0.53	0.57	0.41	0.41	0.27	0.00	0.39	0.00	0.00	0.00
Avail Cap(c_a), veh/h	591	2833	2832	1153	3394	3571	2226	0	1777	1530	2097	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	8.0	8.0	13.9	6.6	6.6	12.7	0.0	12.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.5	0.7	0.7	3.5	0.4	0.4	0.3	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.2	1.2	0.6	0.8	0.8	0.7	0.0	0.5	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	8.7	8.7	17.5	6.9	6.9	13.0	0.0	13.6	0.0	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	B	A	A	A
Approach Vol, veh/h		685			689			209			0	
Approach Delay, s/veh		9.1			8.2			13.3			0.0	
Approach LOS		A			A			B				
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		8.7	7.0	15.7		8.7	5.3	17.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		35.5	20.5	50.5		35.5	10.5	60.5				
Max Q Clear Time (g_c+I1), s		4.1	3.4	6.7		0.0	2.4	5.8				
Green Ext Time (p_c), s		0.8	0.1	4.5		0.0	0.0	4.0				
Intersection Summary												
HCM 6th Ctrl Delay			9.2									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	388	397	735	282	215	83	929
v/c Ratio	0.62	0.21	0.73	0.50	0.50	0.18	0.79
Control Delay	37.8	11.2	30.7	37.0	9.8	35.9	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	11.2	30.7	37.0	9.8	35.9	8.4
Queue Length 50th (ft)	92	50	161	68	0	19	0
Queue Length 95th (ft)	184	108	305	139	65	47	57
Internal Link Dist (ft)		852	424	1178			
Turn Bay Length (ft)	275				450	100	300
Base Capacity (vph)	888	2567	1417	959	585	1191	1570
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.15	0.52	0.29	0.37	0.07	0.59

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	357	365	0	0	491	185	0	259	198	76	0	855
Future Volume (veh/h)	357	365	0	0	491	185	0	259	198	76	0	855
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	0	1856	1856	1856	0	1856
Adj Flow Rate, veh/h	388	397	0	0	534	201	0	282	215	83	0	929
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	3	3	0	3
Cap, veh/h	540	1855	0	0	741	278	0	680	303	211	0	0
Arrive On Green	0.16	0.53	0.00	0.00	0.30	0.30	0.00	0.19	0.19	0.06	0.00	0.00
Sat Flow, veh/h	3428	3618	0	0	2601	941	0	3618	1572	3428	83	
Grp Volume(v), veh/h	388	397	0	0	375	360	0	282	215	83	28.9	
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1763	1686	0	1763	1572	1714	C	
Q Serve(g_s), s	6.6	3.7	0.0	0.0	11.7	11.8	0.0	4.3	7.9	1.4		
Cycle Q Clear(g_c), s	6.6	3.7	0.0	0.0	11.7	11.8	0.0	4.3	7.9	1.4		
Prop In Lane	1.00		0.00	0.00		0.56	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	540	1855	0	0	521	498	0	680	303	211		
V/C Ratio(X)	0.72	0.21	0.00	0.00	0.72	0.72	0.00	0.41	0.71	0.39		
Avail Cap(c_a), veh/h	1142	3295	0	0	931	891	0	1232	550	1532		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	24.6	7.8	0.0	0.0	19.4	19.4	0.0	21.8	23.2	27.8		
Incr Delay (d2), s/veh	1.8	0.1	0.0	0.0	1.9	2.0	0.0	0.4	3.1	1.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.6	1.1	0.0	0.0	4.5	4.4	0.0	1.7	3.0	0.6		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.4	7.8	0.0	0.0	21.3	21.4	0.0	22.2	26.3	28.9		
LnGrp LOS	C	A	A	A	C	C	A	C	C	C		
Approach Vol, veh/h		785			735			497				
Approach Delay, s/veh		17.0			21.3			24.0				
Approach LOS		B			C			C				

Timer - Assigned Phs	1	2		4			7	8
Phs Duration (G+Y+Rc), s	8.3	16.4		36.9			14.2	22.7
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5	4.5
Max Green Setting (Gmax), s	27.5	21.5		57.5			20.5	32.5
Max Q Clear Time (g_c+I1), s	3.4	9.9		5.7			8.6	13.8
Green Ext Time (p_c), s	0.2	2.0		2.8			1.1	4.4

Intersection Summary			
HCM 6th Ctrl Delay			20.7
HCM 6th LOS			C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL	SWR
Lane Group Flow (vph)	79	555	379	328	946	182	126	143	154	127	331
v/c Ratio	0.86	0.36	0.42	0.71	0.99	0.22	0.59	0.64	0.47	0.48	0.94
Control Delay	116.8	23.8	3.9	57.0	55.3	16.8	60.1	62.0	12.3	52.4	64.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.8	23.8	3.9	57.0	55.3	16.8	60.1	62.0	12.3	52.4	64.4
Queue Length 50th (ft)	60	146	0	122	679	72	91	103	0	88	151
Queue Length 95th (ft)	#159	207	60	174	#1032	125	154	172	60	156	#342
Internal Link Dist (ft)		693			852			265		1072	
Turn Bay Length (ft)	150		200	285			125		125		
Base Capacity (vph)	92	1527	897	535	957	813	273	287	374	273	359
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.36	0.42	0.61	0.99	0.22	0.46	0.50	0.41	0.47	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	73	511	349	302	870	167	116	132	142	117	0	275
Future Volume (vph)	73	511	349	302	870	167	116	132	142	117	0	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	1568	3400	1845	1568	1752	1845	1568		1752	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	1568	3400	1845	1568	1752	1845	1568		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	555	379	328	946	182	126	143	154	127	0	299
RTOR Reduction (vph)	0	0	214	0	0	0	0	0	135	0	0	115
Lane Group Flow (vph)	79	555	165	328	946	182	126	143	19	0	127	216
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Prot	Prot	Prot	Prot
Protected Phases	5	2		1	6		4	4	4	8	8	8
Permitted Phases			2			6						
Actuated Green, G (s)	6.1	50.4	50.4	15.7	60.0	60.0	14.0	14.0	14.0		17.5	17.5
Effective Green, g (s)	6.1	50.4	50.4	15.7	60.0	60.0	14.0	14.0	14.0		17.5	17.5
Actuated g/C Ratio	0.05	0.44	0.44	0.14	0.52	0.52	0.12	0.12	0.12		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	92	1528	683	461	957	813	212	223	189		265	237
v/s Ratio Prot	0.05	0.16		c0.10	c0.51		0.07	c0.08	0.01		0.07	c0.14
v/s Ratio Perm			0.11			0.12						
v/c Ratio	0.86	0.36	0.24	0.71	0.99	0.22	0.59	0.64	0.10		0.48	0.91
Uniform Delay, d1	54.3	21.8	20.6	47.8	27.5	15.1	48.1	48.4	45.2		44.9	48.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	50.4	0.1	0.2	5.1	26.0	0.1	4.4	6.2	0.2		1.4	34.7
Delay (s)	104.7	22.0	20.7	52.9	53.4	15.3	52.5	54.6	45.4		46.2	82.9
Level of Service	F	C	C	D	D	B	D	D	D		D	F
Approach Delay (s)		28.0			48.6			50.6			72.8	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	115.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	32
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	34	80	363	83	187	239
v/c Ratio	0.09	0.19	0.32	0.15	0.33	0.11
Control Delay	17.3	7.1	13.4	4.9	15.1	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	7.1	13.4	4.9	15.1	3.2
Queue Length 50th (ft)	7	0	35	0	35	8
Queue Length 95th (ft)	28	28	73	24	87	18
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1235	1128	3294	1478	1664	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.11	0.06	0.11	0.07

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	74	334	76	172	220
Future Volume (veh/h)	31	74	334	76	172	220
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	80	363	83	187	239
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	184	164	870	388	316	2053
Arrive On Green	0.10	0.10	0.25	0.25	0.18	0.58
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	34	80	363	83	187	239
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	0.5	1.4	2.5	1.2	2.8	0.9
Cycle Q Clear(g_c), s	0.5	1.4	2.5	1.2	2.8	0.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	184	164	870	388	316	2053
V/C Ratio(X)	0.18	0.49	0.42	0.21	0.59	0.12
Avail Cap(c_a), veh/h	1632	1452	4853	2165	2494	10382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	12.1	9.1	8.6	10.8	2.7
Incr Delay (d2), s/veh	0.5	2.3	0.3	0.3	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.6	0.3	0.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.2	14.4	9.4	8.9	12.6	2.7
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	114		446			426
Approach Delay, s/veh	13.7		9.3			7.0
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.6	11.6				21.2		7.5
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	40.5	39.5				84.5		26.5
Max Q Clear Time (g_c+I1), s	4.8	4.5				2.9		3.4
Green Ext Time (p_c), s	0.5	2.6				1.6		0.3

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	90	143	142	96	37	319	87	118	517
v/c Ratio	0.16	0.22	0.31	0.24	0.16	0.11	0.26	0.22	0.14	0.51
Control Delay	26.5	24.2	24.9	21.9	2.9	27.4	20.4	25.9	17.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	24.2	24.9	21.9	2.9	27.4	20.4	25.9	17.6	4.6
Queue Length 50th (ft)	18	25	43	42	0	11	47	26	23	0
Queue Length 95th (ft)	57	74	108	104	19	42	100	75	83	72
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	620	857	855	1123	1008	467	2740	714	1668	1467
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.17	0.13	0.10	0.08	0.12	0.12	0.07	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	68	15	132	131	88	34	254	40	80	109	476
Future Volume (veh/h)	54	68	15	132	131	88	34	254	40	80	109	476
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	59	74	16	143	142	96	37	276	43	87	118	517
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	99	147	32	190	280	238	71	1113	171	124	730	618
Arrive On Green	0.06	0.10	0.10	0.11	0.15	0.15	0.04	0.36	0.36	0.07	0.39	0.39
Sat Flow, veh/h	1767	1478	320	1767	1856	1572	1767	3062	471	1767	1856	1572
Grp Volume(v), veh/h	59	0	90	143	142	96	37	157	162	87	118	517
Grp Sat Flow(s),veh/h/ln	1767	0	1798	1767	1856	1572	1767	1763	1771	1767	1856	1572
Q Serve(g_s), s	1.6	0.0	2.4	3.9	3.5	2.8	1.0	3.1	3.2	2.4	2.1	14.9
Cycle Q Clear(g_c), s	1.6	0.0	2.4	3.9	3.5	2.8	1.0	3.1	3.2	2.4	2.1	14.9
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	99	0	179	190	280	238	71	641	643	124	730	618
V/C Ratio(X)	0.60	0.00	0.50	0.75	0.51	0.40	0.52	0.25	0.25	0.70	0.16	0.84
Avail Cap(c_a), veh/h	406	0	736	759	1130	958	300	1567	1574	547	1908	1617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	21.4	21.7	19.5	19.2	23.6	11.1	11.2	22.8	9.8	13.7
Incr Delay (d2), s/veh	5.7	0.0	2.2	5.9	1.4	1.1	5.8	0.2	0.2	7.0	0.1	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.0	1.8	1.5	1.0	0.5	1.1	1.1	1.2	0.7	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.7	0.0	23.6	27.6	20.9	20.3	29.4	11.3	11.4	29.8	9.9	16.8
LnGrp LOS	C	A	C	C	C	C	C	B	B	C	A	B
Approach Vol, veh/h		149			381			356			722	
Approach Delay, s/veh		25.6			23.3			13.2			17.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	22.7	9.9	9.5	6.5	24.2	7.3	12.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	44.5	21.5	20.5	8.5	51.5	11.5	30.5
Max Q Clear Time (g_c+I1), s	4.4	5.2	5.9	4.4	3.0	16.9	3.6	5.5
Green Ext Time (p_c), s	0.1	2.0	0.3	0.3	0.0	2.8	0.1	1.1

Intersection Summary		
HCM 6th Ctrl Delay		18.6
HCM 6th LOS		B

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	442	939	584	37	1576	215
v/c Ratio	0.44	0.79	0.28	0.04	0.76	0.14
Control Delay	28.1	17.5	9.8	3.4	17.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	17.5	9.8	3.4	17.0	0.2
Queue Length 50th (ft)	93	101	70	0	287	0
Queue Length 95th (ft)	204	273	156	14	596	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	2050	1881	3116	1398	3116	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.50	0.19	0.03	0.51	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	407	0	864	0	537	34	0	1450	198
Future Volume (veh/h)	0	0	0	407	0	864	0	537	34	0	1450	198
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				442	0	939	0	584	37	0	1576	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1290	0	1041	0	1910	852	0	1910	
Arrive On Green				0.38	0.00	0.38	0.00	0.54	0.54	0.00	0.54	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				442	0	939	0	584	37	0	1576	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				10.1	0.0	35.2	0.0	10.0	1.2	0.0	40.7	0.0
Cycle Q Clear(g_c), s				10.1	0.0	35.2	0.0	10.0	1.2	0.0	40.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1290	0	1041	0	1910	852	0	1910	
V/C Ratio(X)				0.34	0.00	0.90	0.00	0.31	0.04	0.00	0.83	
Avail Cap(c_a), veh/h				1452	0	1172	0	2714	1211	0	2714	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				24.5	0.0	32.3	0.0	13.8	11.8	0.0	20.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	9.1	0.0	0.1	0.0	0.0	1.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.0	0.0	12.5	0.0	3.8	0.4	0.0	15.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				24.7	0.0	41.4	0.0	13.9	11.8	0.0	22.3	0.0
LnGrp LOS				C	A	D	A	B	B	A	C	
Approach Vol, veh/h					1381			621			1576	
Approach Delay, s/veh					36.0			13.8			22.3	
Approach LOS					D			B			C	

Timer - Assigned Phs		2				6		8	
Phs Duration (G+Y+Rc), s		64.0				64.0		45.8	
Change Period (Y+Rc), s		4.5				4.5		4.5	
Max Green Setting (Gmax), s		84.5				84.5		46.5	
Max Q Clear Time (g_c+I1), s		12.0				42.7		37.2	
Green Ext Time (p_c), s		4.3				16.8		4.1	

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	323	684	1033	147	809	1062	277	61	73	249
v/c Ratio	0.85	0.68	0.66	0.70	0.84	0.89	0.42	0.40	0.44	0.43
Control Delay	63.1	38.8	2.2	65.0	50.8	43.3	19.6	55.7	55.6	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	38.8	2.2	65.0	50.8	43.3	19.6	55.7	55.6	19.0
Queue Length 50th (ft)	221	230	0	101	202	360	93	42	50	80
Queue Length 95th (ft)	#394	310	0	#193	#288	#510	176	85	97	150
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	395	1012	1568	232	969	1262	702	303	351	588
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.68	0.66	0.63	0.83	0.84	0.39	0.20	0.21	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	629	950	135	676	68	977	82	173	56	67	229
Future Volume (veh/h)	297	629	950	135	676	68	977	82	173	56	67	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	323	684	0	147	735	74	1062	89	0	61	73	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	349	960		175	813	81	1122	780		92	269	539
Arrive On Green	0.20	0.27	0.00	0.10	0.17	0.17	0.33	0.42	0.00	0.05	0.14	0.14
Sat Flow, veh/h	1767	3526	1572	1767	4680	468	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	323	684	0	147	529	280	1062	89	0	61	73	249
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1771	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	20.6	20.2	0.0	9.4	17.7	17.9	34.7	3.4	0.0	3.9	4.0	14.2
Cycle Q Clear(g_c), s	20.6	20.2	0.0	9.4	17.7	17.9	34.7	3.4	0.0	3.9	4.0	14.2
Prop In Lane	1.00		1.00	1.00		0.26	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	349	960		175	587	308	1122	780		92	269	539
V/C Ratio(X)	0.92	0.71		0.84	0.90	0.91	0.95	0.11		0.66	0.27	0.46
Avail Cap(c_a), veh/h	361	960		212	590	309	1150	780		276	319	581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	37.8	0.0	51.0	46.6	46.7	37.7	20.3	0.0	53.6	43.8	29.6
Incr Delay (d2), s/veh	28.6	2.5	0.0	21.7	17.1	29.3	15.2	0.1	0.0	8.0	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	8.8	0.0	5.1	8.6	10.2	16.7	1.5	0.0	1.9	1.9	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.0	40.3	0.0	72.7	63.6	75.9	52.9	20.4	0.0	61.5	44.3	30.2
LnGrp LOS	E	D		E	E	E	D	C		E	D	C
Approach Vol, veh/h		1007			956			1151			383	
Approach Delay, s/veh		51.1			68.6			50.4			37.9	
Approach LOS		D			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	52.9	15.9	35.8	42.2	21.2	27.2	24.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	18.0	40.4	13.8	29.8	38.6	19.8	23.5	20.1				
Max Q Clear Time (g_c+I1), s	5.9	5.4	11.4	22.2	36.7	16.2	22.6	19.9				
Green Ext Time (p_c), s	0.1	0.5	0.1	2.6	0.9	0.4	0.1	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			54.2									
HCM 6th LOS			D									

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	59	710	254	33	735	178	28	2	4
v/c Ratio	0.16	0.35	0.25	0.10	0.40	0.22	0.04	0.01	0.01
Control Delay	23.0	10.0	2.9	24.2	12.4	20.5	0.1	26.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	10.0	2.9	24.2	12.4	20.5	0.1	26.5	0.0
Queue Length 50th (ft)	14	36	0	8	78	21	0	1	0
Queue Length 95th (ft)	56	172	40	38	187	65	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	793	3314	1496	574	3263	1723	1254	410	994
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.21	0.17	0.06	0.23	0.10	0.02	0.00	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	653	234	30	676	0	164	0	26	2	0	4
Future Volume (veh/h)	54	653	234	30	676	0	164	0	26	2	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	59	710	0	33	735	0	178	0	28	2	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	106	1322		68	1246	0	364	265	224	5	0	62
Arrive On Green	0.06	0.37	0.00	0.04	0.35	0.00	0.11	0.00	0.14	0.00	0.00	0.04
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	59	710	0	33	735	0	178	0	28	2	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.3	6.4	0.0	0.7	6.9	0.0	2.0	0.0	0.6	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.3	6.4	0.0	0.7	6.9	0.0	2.0	0.0	0.6	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	106	1322		68	1246	0	364	265	224	5	0	62
V/C Ratio(X)	0.56	0.54		0.49	0.59	0.00	0.49	0.00	0.12	0.41	0.00	0.06
Avail Cap(c_a), veh/h	628	4625		455	4279	0	1471	1388	1176	325	0	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	10.0	0.0	19.2	10.8	0.0	17.2	0.0	15.3	20.3	0.0	18.9
Incr Delay (d2), s/veh	4.6	0.3	0.0	5.4	0.4	0.0	1.0	0.0	0.2	47.6	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.7	0.0	0.4	1.9	0.0	0.7	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	10.3	0.0	24.6	11.2	0.0	18.2	0.0	15.5	67.9	0.0	19.3
LnGrp LOS	C	B		C	B	A	B	A	B	E	A	B
Approach Vol, veh/h		769			768			206			6	
Approach Delay, s/veh		11.3			11.8			17.8			35.5	
Approach LOS		B			B			B			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	10.3	6.1	19.8	8.8	6.1	6.9	18.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	30.5	10.5	53.5	17.5	20.5	14.5	49.5
Max Q Clear Time (g_c+I1), s	2.0	2.6	2.7	8.4	4.0	2.1	3.3	8.9
Green Ext Time (p_c), s	0.0	0.1	0.0	5.3	0.5	0.0	0.1	5.5

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	482	228	42	592	130	23
v/c Ratio	0.28	0.26	0.10	0.28	0.14	0.05
Control Delay	8.9	3.0	15.1	4.6	13.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	3.0	15.1	4.6	13.7	8.5
Queue Length 50th (ft)	20	0	5	26	7	0
Queue Length 95th (ft)	81	33	30	48	33	14
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1422	3505	2938	1358
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.15	0.03	0.17	0.04	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	443	210	39	545	120	21
Future Volume (veh/h)	443	210	39	545	120	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	482	228	42	592	130	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1089	486	274	2129	397	182
Arrive On Green	0.31	0.31	0.16	0.60	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	482	228	42	592	130	23
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	3.5	3.8	0.7	2.6	1.1	0.4
Cycle Q Clear(g_c), s	3.5	3.8	0.7	2.6	1.1	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1089	486	274	2129	397	182
V/C Ratio(X)	0.44	0.47	0.15	0.28	0.33	0.13
Avail Cap(c_a), veh/h	5652	2521	1403	8944	3148	1444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	9.0	11.7	3.0	13.0	12.7
Incr Delay (d2), s/veh	0.3	0.7	0.3	0.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.8	0.2	0.1	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.7	12.0	3.1	13.5	13.0
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	710			634	153	
Approach Delay, s/veh	9.3			3.7	13.5	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.2	9.5	14.4				23.9
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		29.5	25.5	51.5				81.5
Max Q Clear Time (g_c+I1), s		3.1	2.7	5.8				4.6
Green Ext Time (p_c), s		0.5	0.1	4.2				4.3

Intersection Summary			
HCM 6th Ctrl Delay			7.4
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1014	203	918	40	17	185	133	91
v/c Ratio	0.37	0.72	0.59	0.50	0.05	0.06	0.39	0.62	0.22
Control Delay	45.4	24.6	40.8	15.1	2.5	30.2	9.0	45.7	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	24.6	40.8	15.1	2.5	30.2	9.0	45.7	12.0
Queue Length 50th (ft)	34	208	91	153	0	7	5	59	6
Queue Length 95th (ft)	102	403	215	284	12	29	64	153	50
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	293	2222	599	2758	1245	578	808	445	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.46	0.34	0.33	0.03	0.03	0.23	0.30	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	896	37	187	845	37	16	12	158	122	15	69
Future Volume (veh/h)	69	896	37	187	845	37	16	12	158	122	15	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	974	40	203	918	40	17	13	172	133	16	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	102	1354	56	258	1694	756	380	28	371	293	71	334
Arrive On Green	0.06	0.39	0.39	0.15	0.48	0.48	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1767	3451	142	1767	3526	1572	1295	112	1478	1189	284	1332
Grp Volume(v), veh/h	75	498	516	203	918	40	17	0	185	133	0	91
Grp Sat Flow(s),veh/h/ln	1767	1763	1830	1767	1763	1572	1295	0	1590	1189	0	1616
Q Serve(g_s), s	2.7	15.3	15.3	7.1	11.7	0.9	0.7	0.0	6.3	6.8	0.0	2.9
Cycle Q Clear(g_c), s	2.7	15.3	15.3	7.1	11.7	0.9	3.5	0.0	6.3	13.1	0.0	2.9
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.93	1.00		0.82
Lane Grp Cap(c), veh/h	102	692	718	258	1694	756	380	0	399	293	0	405
V/C Ratio(X)	0.74	0.72	0.72	0.79	0.54	0.05	0.04	0.00	0.46	0.45	0.00	0.22
Avail Cap(c_a), veh/h	345	1309	1359	705	3335	1487	733	0	833	618	0	846
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.7	16.5	16.5	26.4	11.7	8.9	20.4	0.0	20.3	25.9	0.0	19.0
Incr Delay (d2), s/veh	9.9	1.4	1.4	5.3	0.3	0.0	0.0	0.0	0.8	1.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.8	6.0	3.2	4.0	0.3	0.2	0.0	2.3	1.9	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.6	17.9	17.8	31.7	11.9	8.9	20.5	0.0	21.2	27.0	0.0	19.3
LnGrp LOS	D	B	B	C	B	A	C	A	C	C	A	B
Approach Vol, veh/h		1089			1161			202			224	
Approach Delay, s/veh		19.3			15.3			21.1			23.9	
Approach LOS		B			B			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.5	13.8	29.6		20.5	8.2	35.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		33.5	25.5	47.5		33.5	12.5	60.5				
Max Q Clear Time (g_c+I1), s		8.3	9.1	17.3		15.1	4.7	13.7				
Green Ext Time (p_c), s		1.2	0.5	7.8		0.9	0.1	8.4				
Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	597	436	556	92	48	449	109	58	60
v/c Ratio	0.40	0.70	0.77	0.32	0.43	0.21	0.77	0.47	0.24	0.19
Control Delay	51.0	38.0	40.3	15.6	48.3	41.6	13.8	48.1	41.0	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	38.0	40.3	15.6	48.3	41.6	13.8	48.1	41.0	1.3
Queue Length 50th (ft)	39	156	223	90	49	26	0	58	31	0
Queue Length 95th (ft)	104	#318	#466	183	119	66	97	136	75	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	231	1033	797	2112	393	543	778	393	544	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.58	0.55	0.26	0.23	0.09	0.58	0.28	0.11	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	476	74	401	377	134	85	44	413	100	53	55
Future Volume (veh/h)	67	476	74	401	377	134	85	44	413	100	53	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	73	517	80	436	410	146	92	48	449	109	58	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	94	627	97	480	1082	381	130	464	393	147	482	408
Arrive On Green	0.05	0.20	0.20	0.27	0.42	0.42	0.07	0.25	0.25	0.08	0.26	0.26
Sat Flow, veh/h	1767	3061	472	1767	2556	900	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	73	297	300	436	281	275	92	48	449	109	58	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1771	1767	1763	1694	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.9	15.2	15.3	22.5	10.3	10.5	4.8	1.9	23.6	5.7	2.3	2.8
Cycle Q Clear(g_c), s	3.9	15.2	15.3	22.5	10.3	10.5	4.8	1.9	23.6	5.7	2.3	2.8
Prop In Lane	1.00		0.27	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	361	362	480	746	717	130	464	393	147	482	408
V/C Ratio(X)	0.78	0.82	0.83	0.91	0.38	0.38	0.71	0.10	1.14	0.74	0.12	0.15
Avail Cap(c_a), veh/h	198	446	448	683	929	893	337	464	393	337	482	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	35.9	36.0	33.3	18.7	18.8	42.8	27.3	35.4	42.3	26.7	26.9
Incr Delay (d2), s/veh	12.7	9.8	10.2	12.3	0.3	0.3	6.9	0.1	90.4	7.1	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	7.4	7.5	11.0	4.2	4.1	2.3	0.8	18.7	2.8	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.8	45.7	46.2	45.6	19.0	19.1	49.7	27.4	125.8	49.5	26.8	27.1
LnGrp LOS	E	D	D	D	B	B	D	C	F	D	C	C
Approach Vol, veh/h		670			992			589			227	
Approach Delay, s/veh		47.2			30.7			105.9			37.8	
Approach LOS		D			C			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.4	28.1	30.2	23.8	11.4	29.0	9.5	44.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	18.0	23.6	36.5	23.9	18.0	23.6	10.6	49.8				
Max Q Clear Time (g_c+I1), s	7.7	25.6	24.5	17.3	6.8	4.8	5.9	12.5				
Green Ext Time (p_c), s	0.2	0.0	1.1	2.0	0.1	0.4	0.0	3.9				
Intersection Summary												
HCM 6th Ctrl Delay			53.7									
HCM 6th LOS			D									

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	523	27	981	79	568
v/c Ratio	0.59	0.07	0.67	0.31	0.28
Control Delay	26.8	10.5	16.8	34.9	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	10.5	16.8	34.9	6.8
Queue Length 50th (ft)	96	0	143	29	47
Queue Length 95th (ft)	193	21	273	88	96
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	1965	834	2829	469	3372
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.27	0.03	0.35	0.17	0.17

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	478	28	588	315	73	523
Future Volume (veh/h)	478	28	588	315	73	523
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	520	30	639	342	79	568
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	769	342	974	521	119	2110
Arrive On Green	0.22	0.22	0.44	0.44	0.07	0.60
Sat Flow, veh/h	3534	1572	2310	1187	1767	3618
Grp Volume(v), veh/h	520	30	508	473	79	568
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1642	1767	1763
Q Serve(g_s), s	6.6	0.7	11.1	11.1	2.1	3.8
Cycle Q Clear(g_c), s	6.6	0.7	11.1	11.1	2.1	3.8
Prop In Lane	1.00	1.00		0.72	1.00	
Lane Grp Cap(c), veh/h	769	342	774	721	119	2110
V/C Ratio(X)	0.68	0.09	0.66	0.66	0.66	0.27
Avail Cap(c_a), veh/h	2422	1077	2073	1931	560	5588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	15.3	10.8	10.8	22.3	4.7
Incr Delay (d2), s/veh	1.1	0.1	1.0	1.0	6.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.2	3.6	3.4	1.0	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.6	15.4	11.8	11.8	28.5	4.8
LnGrp LOS	B	B	B	B	C	A
Approach Vol, veh/h	550		981			647
Approach Delay, s/veh	18.4		11.8			7.7
Approach LOS	B		B			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	7.8	26.0	33.8	15.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	57.5	77.5	33.5
Max Q Clear Time (g_c+I1), s	4.1	13.1	5.8	8.6
Green Ext Time (p_c), s	0.1	8.4	4.5	2.0

Intersection Summary	
HCM 6th Ctrl Delay	12.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	238	110	448	443	200
v/c Ratio	0.51	0.06	0.54	0.50	0.38
Control Delay	20.8	5.6	9.4	17.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	5.6	9.4	17.4	5.8
Queue Length 50th (ft)	53	6	16	47	0
Queue Length 95th (ft)	136	17	60	108	47
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1455	3505	2112	2675	1180
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.03	0.21	0.17	0.17

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	219	101	127	285	332	259
Future Volume (veh/h)	219	101	127	285	332	259
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	238	110	138	310	424	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	317	2007	504	450	789	351
Arrive On Green	0.18	0.57	0.29	0.29	0.22	0.22
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	238	110	138	310	424	214
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	5.5	0.6	2.6	7.6	4.6	5.3
Cycle Q Clear(g_c), s	5.5	0.6	2.6	7.6	4.6	5.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	317	2007	504	450	789	351
V/C Ratio(X)	0.75	0.05	0.27	0.69	0.54	0.61
Avail Cap(c_a), veh/h	1610	5977	1199	1070	3057	1360
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	4.2	12.0	13.8	14.9	15.1
Incr Delay (d2), s/veh	3.6	0.0	0.3	1.9	0.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.1	0.9	2.4	1.6	4.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.5	4.2	12.3	15.7	15.4	16.9
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		348	448		638	
Approach Delay, s/veh		15.3	14.6		15.9	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				29.2		14.2	12.3	16.9
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				73.5		37.5	39.5	29.5
Max Q Clear Time (g_c+I1), s				2.6		7.3	7.5	9.6
Green Ext Time (p_c), s				0.8		2.4	0.7	2.8

Intersection Summary			
HCM 6th Ctrl Delay			15.4
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	11	373	5	19	348	143	23	261
v/c Ratio	0.23	0.04	0.65	0.02	0.08	0.60	0.08	0.10	0.38
Control Delay	25.7	22.7	9.4	29.4	20.9	20.6	9.0	27.9	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	22.7	9.4	29.4	20.9	20.6	9.0	27.9	17.4
Queue Length 50th (ft)	14	2	0	1	2	71	5	5	22
Queue Length 95th (ft)	66	18	71	13	24	230	40	34	81
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	433	1257	1187	207	907	1493	3296	282	1714
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.01	0.31	0.02	0.02	0.23	0.04	0.08	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	10	343	5	9	8	320	129	3	21	157	83
Future Volume (veh/h)	59	10	343	5	9	8	320	129	3	21	157	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	64	11	373	5	10	9	348	140	3	23	171	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	101	525	445	12	209	188	427	1233	26	48	307	154
Arrive On Green	0.06	0.28	0.28	0.01	0.23	0.23	0.24	0.35	0.35	0.03	0.13	0.13
Sat Flow, veh/h	1767	1856	1572	1767	900	810	1767	3529	75	1767	2272	1141
Grp Volume(v), veh/h	64	11	373	5	0	19	348	70	73	23	131	130
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1710	1767	1763	1842	1767	1763	1650
Q Serve(g_s), s	1.9	0.2	12.0	0.2	0.0	0.5	10.0	1.4	1.5	0.7	3.7	4.0
Cycle Q Clear(g_c), s	1.9	0.2	12.0	0.2	0.0	0.5	10.0	1.4	1.5	0.7	3.7	4.0
Prop In Lane	1.00		1.00	1.00		0.47	1.00		0.04	1.00		0.69
Lane Grp Cap(c), veh/h	101	525	445	12	0	398	427	616	644	48	238	223
V/C Ratio(X)	0.63	0.02	0.84	0.42	0.00	0.05	0.82	0.11	0.11	0.48	0.55	0.58
Avail Cap(c_a), veh/h	377	1049	889	180	0	777	1393	1912	1998	246	768	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	13.9	18.2	26.7	0.0	16.1	19.3	11.9	11.9	25.9	21.8	21.9
Incr Delay (d2), s/veh	6.4	0.0	4.3	22.2	0.0	0.0	3.9	0.1	0.1	7.3	2.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.1	4.4	0.1	0.0	0.2	4.0	0.5	0.5	0.4	1.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	14.0	22.4	48.9	0.0	16.1	23.2	12.0	12.0	33.2	23.8	24.3
LnGrp LOS	C	B	C	D	A	B	C	B	B	C	C	C
Approach Vol, veh/h		448			24			491			284	
Approach Delay, s/veh		23.5			22.9			19.9			24.8	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	23.3	4.9	19.8	17.5	11.8	7.6	17.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	58.5	5.5	30.5	42.5	23.5	11.5	24.5
Max Q Clear Time (g_c+I1), s	2.7	3.5	2.2	14.0	12.0	6.0	3.9	2.5
Green Ext Time (p_c), s	0.0	0.8	0.0	1.3	1.1	1.3	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay		22.4
HCM 6th LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	338	40	162	130	358	34	441
v/c Ratio	0.34	0.32	0.16	0.28	0.36	0.28	0.14	0.50
Control Delay	26.9	11.7	28.2	22.2	26.7	14.6	28.4	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	11.7	28.2	22.2	26.7	14.6	28.4	16.5
Queue Length 50th (ft)	36	19	12	21	40	33	11	46
Queue Length 95th (ft)	95	73	45	56	103	97	40	104
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	871	2150	406	1620	918	2832	406	2166
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.16	0.10	0.10	0.14	0.13	0.08	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	163	148	37	112	37	120	274	55	31	238	167
Future Volume (veh/h)	107	163	148	37	112	37	120	274	55	31	238	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	116	177	0	40	122	0	130	298	0	34	259	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	169	650		81	475		179	805		71	589	
Arrive On Green	0.10	0.18	0.00	0.05	0.13	0.00	0.10	0.23	0.00	0.04	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	116	177	0	40	122	0	130	298	0	34	259	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	2.3	1.5	0.0	0.8	1.1	0.0	2.6	2.6	0.0	0.7	2.4	0.0
Cycle Q Clear(g_c), s	2.3	1.5	0.0	0.8	1.1	0.0	2.6	2.6	0.0	0.7	2.4	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	169	650		81	475		179	805		71	589	
V/C Ratio(X)	0.69	0.27		0.49	0.26		0.73	0.37		0.48	0.44	
Avail Cap(c_a), veh/h	1108	3291		517	2112		1207	4667		517	3291	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.7	12.6	0.0	16.7	13.9	0.0	15.6	11.7	0.0	16.9	13.4	0.0
Incr Delay (d2), s/veh	4.9	0.2	0.0	4.6	0.3	0.0	5.5	0.3	0.0	5.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.5	0.0	0.4	0.4	0.0	1.1	0.8	0.0	0.3	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.6	12.8	0.0	21.3	14.2	0.0	21.2	12.0	0.0	21.8	14.0	0.0
LnGrp LOS	C	B		C	B		C	B		C	B	
Approach Vol, veh/h		293			162			428			293	
Approach Delay, s/veh		15.9			16.0			14.8			14.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	12.7	6.1	11.1	8.1	10.5	7.9	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	47.5	10.5	33.5	24.5	33.5	22.5	21.5
Max Q Clear Time (g_c+I1), s	2.7	4.6	2.8	3.5	4.6	4.4	4.3	3.1
Green Ext Time (p_c), s	0.0	2.0	0.0	1.1	0.3	1.6	0.2	0.6

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	404	199	229	143	208
v/c Ratio	0.48	0.46	0.11	0.38	0.42
Control Delay	15.5	20.0	4.6	20.6	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	20.0	4.6	20.6	6.4
Queue Length 50th (ft)	38	43	11	32	0
Queue Length 95th (ft)	88	112	27	88	45
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	2423	1439	3505	1410	1302
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.14	0.07	0.10	0.16

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	250	121	183	211	132	191
Future Volume (veh/h)	250	121	183	211	132	191
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	272	132	199	229	143	208
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	549	259	274	1852	365	325
Arrive On Green	0.24	0.24	0.15	0.53	0.21	0.21
Sat Flow, veh/h	2417	1097	1767	3618	1767	1572
Grp Volume(v), veh/h	204	200	199	229	143	208
Grp Sat Flow(s),veh/h/ln	1763	1658	1767	1763	1767	1572
Q Serve(g_s), s	3.4	3.5	3.6	1.1	2.3	4.1
Cycle Q Clear(g_c), s	3.4	3.5	3.6	1.1	2.3	4.1
Prop In Lane		0.66	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	416	392	274	1852	365	325
V/C Ratio(X)	0.49	0.51	0.73	0.12	0.39	0.64
Avail Cap(c_a), veh/h	1708	1607	1976	7832	1923	1711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	11.1	13.5	4.0	11.5	12.2
Incr Delay (d2), s/veh	0.9	1.0	3.7	0.0	0.7	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.0	1.3	0.2	0.8	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.0	12.2	17.2	4.1	12.2	14.3
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	404			428	351	
Approach Delay, s/veh	12.1			10.2	13.4	
Approach LOS	B			B	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		11.4	9.7	12.4				22.1
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		36.5	37.5	32.5				74.5
Max Q Clear Time (g_c+I1), s		6.1	5.6	5.5				3.1
Green Ext Time (p_c), s		1.1	0.6	2.4				1.6

Intersection Summary			
HCM 6th Ctrl Delay			11.8
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	24	837	60	375	261	102	7
v/c Ratio	0.11	0.62	0.24	0.24	0.58	0.15	0.01
Control Delay	35.9	18.2	33.4	12.5	26.5	0.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	18.2	33.4	12.5	26.5	0.5	0.0
Queue Length 50th (ft)	8	128	21	33	85	0	0
Queue Length 95th (ft)	39	261	71	104	204	0	0
Internal Link Dist (ft)		424		851		1161	269
Turn Bay Length (ft)	125		125		75		
Base Capacity (vph)	252	2648	421	2883	1075	1275	1318
Starvation Cap Reductn	0	17	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.32	0.14	0.13	0.24	0.08	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	576	194	55	344	1	240	0	94	0	0	6
Future Volume (veh/h)	22	576	194	55	344	1	240	0	94	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	626	211	60	374	1	261	0	102	0	0	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	51	988	333	104	1485	4	511	0	396	164	0	396
Arrive On Green	0.03	0.38	0.38	0.06	0.41	0.41	0.25	0.00	0.25	0.00	0.00	0.25
Sat Flow, veh/h	1767	2590	872	1767	3607	10	1397	0	1572	1282	0	1572
Grp Volume(v), veh/h	24	426	411	60	183	192	261	0	102	0	0	7
Grp Sat Flow(s),veh/h/ln	1767	1763	1699	1767	1763	1854	1397	0	1572	1282	0	1572
Q Serve(g_s), s	0.6	8.7	8.7	1.5	3.0	3.0	7.6	0.0	2.3	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.6	8.7	8.7	1.5	3.0	3.0	7.7	0.0	2.3	0.0	0.0	0.1
Prop In Lane	1.00		0.51	1.00		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	51	673	648	104	726	763	511	0	396	164	0	396
V/C Ratio(X)	0.47	0.63	0.63	0.57	0.25	0.25	0.51	0.00	0.26	0.00	0.00	0.02
Avail Cap(c_a), veh/h	302	1907	1838	503	2108	2216	1639	0	1665	1199	0	1665
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	21.0	11.1	11.1	20.1	8.5	8.5	15.2	0.0	13.1	0.0	0.0	12.3
Incr Delay (d2), s/veh	6.6	1.0	1.0	4.9	0.2	0.2	0.8	0.0	0.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.7	2.6	0.7	0.9	0.9	2.1	0.0	0.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	12.1	12.1	25.0	8.7	8.6	16.0	0.0	13.5	0.0	0.0	12.4
LnGrp LOS	C	B	B	C	A	A	B	A	B	A	A	B
Approach Vol, veh/h		861			435			363			7	
Approach Delay, s/veh		12.5			10.9			15.3			12.4	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		15.6	7.1	21.3		15.6	5.8	22.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		46.5	12.5	47.5		46.5	7.5	52.5				
Max Q Clear Time (g_c+I1), s		9.7	3.5	10.7		2.1	2.6	5.0				
Green Ext Time (p_c), s		1.5	0.1	6.1		0.0	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			12.7									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	666	471	681	398	130	249	1213
v/c Ratio	0.80	0.26	0.81	0.67	0.35	0.42	0.82
Control Delay	45.2	14.8	39.0	46.5	10.2	40.3	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	14.8	39.0	46.5	10.2	40.3	7.6
Queue Length 50th (ft)	213	84	180	131	0	77	0
Queue Length 95th (ft)	#325	146	#310	208	55	121	58
Internal Link Dist (ft)		852	424	1178			
Turn Bay Length (ft)	275				450	100	300
Base Capacity (vph)	1010	2138	974	749	437	975	1656
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.22	0.70	0.53	0.30	0.26	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	613	433	0	0	366	260	0	366	120	229	0	1116
Future Volume (veh/h)	613	433	0	0	366	260	0	366	120	229	0	1116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	0	1856	1856	1856	0	1856
Adj Flow Rate, veh/h	666	471	0	0	398	283	0	398	130	249	0	1213
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	3	3	0	3
Cap, veh/h	816	1947	0	0	503	354	0	573	256	365	0	0
Arrive On Green	0.24	0.55	0.00	0.00	0.25	0.25	0.00	0.16	0.16	0.11	0.00	0.00
Sat Flow, veh/h	3428	3618	0	0	2070	1391	0	3618	1572	3428	249	
Grp Volume(v), veh/h	666	471	0	0	354	327	0	398	130	249	34.8	
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1763	1605	0	1763	1572	1714	C	
Q Serve(g_s), s	13.9	5.2	0.0	0.0	14.2	14.4	0.0	8.1	5.7	5.3		
Cycle Q Clear(g_c), s	13.9	5.2	0.0	0.0	14.2	14.4	0.0	8.1	5.7	5.3		
Prop In Lane	1.00		0.00	0.00		0.87	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	816	1947	0	0	449	409	0	573	256	365		
V/C Ratio(X)	0.82	0.24	0.00	0.00	0.79	0.80	0.00	0.69	0.51	0.68		
Avail Cap(c_a), veh/h	1293	2729	0	0	595	542	0	956	427	1247		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	27.2	8.7	0.0	0.0	26.3	26.4	0.0	29.9	28.9	32.5		
Incr Delay (d2), s/veh	2.3	0.1	0.0	0.0	5.2	6.2	0.0	1.5	1.6	2.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.6	1.7	0.0	0.0	6.2	5.8	0.0	3.4	2.2	2.2		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	8.8	0.0	0.0	31.5	32.6	0.0	31.4	30.4	34.8		
LnGrp LOS	C	A	A	A	C	C	A	C	C	C		
Approach Vol, veh/h		1137			681			528				
Approach Delay, s/veh		20.9			32.0			31.2				
Approach LOS		C			C			C				
Timer - Assigned Phs	1	2		4			7	8				
Phs Duration (G+Y+Rc), s	12.5	16.8		46.2			22.5	23.7				
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s	27.5	20.5		58.5			28.5	25.5				
Max Q Clear Time (g_c+I1), s	7.3	10.1		7.2			15.9	16.4				
Green Ext Time (p_c), s	0.8	2.2		3.4			2.1	2.8				
Intersection Summary												
HCM 6th Ctrl Delay			27.2									
HCM 6th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	SBL	SBT	SBR	SWL	SWR
Lane Group Flow (vph)	92	803	575	524	1094	170	155	99	165	251
v/c Ratio	0.56	0.70	0.69	0.78	0.69	0.67	0.58	0.29	0.65	0.73
Control Delay	63.6	34.5	10.7	49.5	26.3	58.3	53.3	5.2	56.6	34.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	34.5	10.7	49.5	26.3	58.3	53.3	5.2	56.6	34.4
Queue Length 50th (ft)	62	251	47	177	319	113	102	0	110	76
Queue Length 95th (ft)	#134	351	182	263	438	201	183	23	194	178
Internal Link Dist (ft)		693			852		265		1072	
Turn Bay Length (ft)	150		200	285		125		125		
Base Capacity (vph)	187	1449	929	815	1859	331	348	406	348	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.55	0.62	0.64	0.59	0.51	0.45	0.24	0.47	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (vph)	85	739	529	482	810	197	156	143	91	152	0	210
Future Volume (vph)	85	739	529	482	810	197	156	143	91	152	0	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	1568	3400	3402		1752	1845	1568		1752	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	1568	3400	3402		1752	1845	1568		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	803	575	524	880	214	170	155	99	165	0	228
RTOR Reduction (vph)	0	0	316	0	0	0	0	0	85	0	0	116
Lane Group Flow (vph)	92	803	259	524	1094	0	170	155	14	0	165	135
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Prot	Prot	Prot	Prot
Protected Phases	5	2		1	6		4	4	4	8	8	8
Permitted Phases			2									
Actuated Green, G (s)	7.6	34.8	34.8	20.2	47.4		14.7	14.7	14.7		14.8	14.8
Effective Green, g (s)	7.6	34.8	34.8	20.2	47.4		14.7	14.7	14.7		14.8	14.8
Actuated g/C Ratio	0.07	0.34	0.34	0.20	0.46		0.14	0.14	0.14		0.14	0.14
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	129	1189	532	670	1573		251	264	224		252	226
v/s Ratio Prot	0.05	0.23		c0.15	c0.32		c0.10	0.08	0.01		c0.09	0.09
v/s Ratio Perm			0.16									
v/c Ratio	0.71	0.68	0.49	0.78	0.70		0.68	0.59	0.06		0.65	0.60
Uniform Delay, d1	46.4	29.0	26.8	39.1	21.8		41.6	41.1	37.9		41.4	41.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	17.0	1.5	0.7	5.9	1.4		7.1	3.3	0.1		6.0	4.2
Delay (s)	63.4	30.5	27.5	45.0	23.2		48.7	44.4	38.1		47.4	45.2
Level of Service	E	C	C	D	C		D	D	D		D	D
Approach Delay (s)		31.4			30.2			44.6			46.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	21
Future Volume (vph)	21
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	23
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	99	295	424	33	67	413
v/c Ratio	0.24	0.49	0.39	0.07	0.18	0.24
Control Delay	15.7	5.9	12.5	5.8	16.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	5.9	12.5	5.8	16.2	5.2
Queue Length 50th (ft)	18	0	40	0	12	18
Queue Length 95th (ft)	54	47	81	14	42	39
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1714	1541	3271	1465	1284	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.19	0.13	0.02	0.05	0.12

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	91	271	390	30	62	380
Future Volume (veh/h)	91	271	390	30	62	380
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	99	295	424	33	67	413
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	454	404	839	374	240	1751
Arrive On Green	0.26	0.26	0.24	0.24	0.14	0.50
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	99	295	424	33	67	413
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	1.6	6.3	3.8	0.6	1.2	2.4
Cycle Q Clear(g_c), s	1.6	6.3	3.8	0.6	1.2	2.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	454	404	839	374	240	1751
V/C Ratio(X)	0.22	0.73	0.51	0.09	0.28	0.24
Avail Cap(c_a), veh/h	2103	1872	3714	1656	1185	6511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.7	12.4	12.1	10.8	14.2	5.2
Incr Delay (d2), s/veh	0.2	2.5	0.5	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.8	1.1	0.2	0.4	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.9	15.0	12.5	10.9	14.8	5.3
LnGrp LOS	B	B	B	B	B	A
Approach Vol, veh/h	394		457			480
Approach Delay, s/veh	14.0		12.4			6.6
Approach LOS	B		B			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	9.5	13.2	22.7	13.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	24.5	38.5	67.5	43.5
Max Q Clear Time (g_c+I1), s	3.2	5.8	4.4	8.3
Green Ext Time (p_c), s	0.1	2.9	2.8	1.3

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	86	197	108	114	162	76	931	161	116	417
v/c Ratio	0.44	0.63	0.49	0.34	0.38	0.41	0.73	0.58	0.14	0.44
Control Delay	52.3	47.7	51.5	40.2	9.3	52.2	29.6	49.8	19.3	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	47.7	51.5	40.2	9.3	52.2	29.6	49.8	19.3	3.6
Queue Length 50th (ft)	48	106	61	59	0	43	243	90	42	0
Queue Length 95th (ft)	118	217	139	131	57	108	390	189	91	57
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	269	473	328	542	575	256	1883	417	1166	1144
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.42	0.33	0.21	0.28	0.30	0.49	0.39	0.10	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	151	30	99	105	149	70	706	151	148	107	384
Future Volume (veh/h)	79	151	30	99	105	149	70	706	151	148	107	384
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	86	164	33	108	114	162	76	767	164	161	116	417
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	112	224	45	141	308	261	103	1068	228	208	796	675
Arrive On Green	0.06	0.15	0.15	0.08	0.17	0.17	0.06	0.37	0.37	0.12	0.43	0.43
Sat Flow, veh/h	1767	1500	302	1767	1856	1572	1767	2889	618	1767	1856	1572
Grp Volume(v), veh/h	86	0	197	108	114	162	76	468	463	161	116	417
Grp Sat Flow(s),veh/h/ln	1767	0	1801	1767	1856	1572	1767	1763	1744	1767	1856	1572
Q Serve(g_s), s	3.0	0.0	6.6	3.8	3.5	6.1	2.7	14.5	14.5	5.6	2.4	13.1
Cycle Q Clear(g_c), s	3.0	0.0	6.6	3.8	3.5	6.1	2.7	14.5	14.5	5.6	2.4	13.1
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	112	0	268	141	308	261	103	652	645	208	796	675
V/C Ratio(X)	0.77	0.00	0.73	0.76	0.37	0.62	0.74	0.72	0.72	0.77	0.15	0.62
Avail Cap(c_a), veh/h	354	0	610	432	711	602	337	1258	1245	549	1547	1311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	25.8	28.6	23.5	24.6	29.4	17.2	17.2	27.2	11.0	14.1
Incr Delay (d2), s/veh	10.6	0.0	3.9	8.3	0.7	2.4	9.9	1.5	1.5	6.1	0.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	3.0	1.9	1.5	2.3	1.4	5.5	5.4	2.6	0.9	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	0.0	29.7	36.9	24.3	27.0	39.3	18.7	18.7	33.2	11.1	15.0
LnGrp LOS	D	A	C	D	C	C	D	B	B	C	B	B
Approach Vol, veh/h		283			384			1007			694	
Approach Delay, s/veh		32.8			29.0			20.2			18.6	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	28.0	9.6	14.0	8.2	31.7	8.5	15.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	19.7	45.3	15.5	21.5	12.1	52.9	12.7	24.3
Max Q Clear Time (g_c+I1), s	7.6	16.5	5.8	8.6	4.7	15.1	5.0	8.1
Green Ext Time (p_c), s	0.3	7.0	0.2	0.8	0.1	2.3	0.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	22.7
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	373	953	999	90	1427	279
v/c Ratio	0.28	0.82	0.55	0.11	0.78	0.18
Control Delay	23.5	31.0	18.6	3.5	24.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	31.0	18.6	3.5	24.5	0.2
Queue Length 50th (ft)	84	263	219	0	377	0
Queue Length 95th (ft)	155	464	365	27	617	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	2024	1707	2644	1205	2644	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.56	0.38	0.07	0.54	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	343	0	877	0	919	83	0	1313	257
Future Volume (veh/h)	0	0	0	343	0	877	0	919	83	0	1313	257
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				373	0	953	0	999	90	0	1427	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1370	0	1106	0	1783	795	0	1783	
Arrive On Green				0.40	0.00	0.40	0.00	0.51	0.51	0.00	0.51	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				373	0	953	0	999	90	0	1427	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				7.0	0.0	30.0	0.0	18.6	2.9	0.0	32.0	0.0
Cycle Q Clear(g_c), s				7.0	0.0	30.0	0.0	18.6	2.9	0.0	32.0	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1370	0	1106	0	1783	795	0	1783	
V/C Ratio(X)				0.27	0.00	0.86	0.00	0.56	0.11	0.00	0.80	
Avail Cap(c_a), veh/h				2036	0	1644	0	2761	1231	0	2761	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.2	0.0	26.2	0.0	16.2	12.3	0.0	19.5	0.0
Incr Delay (d2), s/veh				0.1	0.0	3.3	0.0	0.3	0.1	0.0	1.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.6	0.0	9.6	0.0	6.8	0.9	0.0	11.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				19.3	0.0	29.4	0.0	16.5	12.4	0.0	20.5	0.0
LnGrp LOS				B	A	C	A	B	B	A	C	
Approach Vol, veh/h					1326			1089			1427	
Approach Delay, s/veh					26.6			16.2			20.5	
Approach LOS					C			B			C	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		52.6				52.6		42.5				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		74.5				74.5		56.5				
Max Q Clear Time (g_c+I1), s		20.6				34.0		32.0				
Green Ext Time (p_c), s		8.9				14.1		6.0				

Intersection Summary	
HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBR
Lane Group Flow (vph)	12	803	623	112	893	419	97	2
v/c Ratio	0.07	0.59	0.40	0.36	0.32	0.50	0.13	0.01
Control Delay	32.5	17.8	0.8	28.6	7.6	23.5	0.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	17.8	0.8	28.6	7.6	23.5	0.4	0.0
Queue Length 50th (ft)	4	119	0	36	46	67	0	0
Queue Length 95th (ft)	22	219	0	95	118	135	0	0
Internal Link Dist (ft)		1084			414		644	
Turn Bay Length (ft)	230			215		425		
Base Capacity (vph)	180	2537	1568	540	4345	1557	1012	283
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.32	0.40	0.21	0.21	0.27	0.10	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	803	623	112	893	0	419	0	97	0	0	2
Future Volume (veh/h)	12	803	623	112	893	0	419	0	97	0	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	803	0	112	893	0	419	0	0	0	0	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	27	1250		147	2140	0	630	520		4	5	29
Arrive On Green	0.02	0.35	0.00	0.08	0.42	0.00	0.18	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1767	3526	1572	1767	5233	0	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	12	803	0	112	893	0	419	0	0	0	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	0	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	0.3	9.1	0.0	3.0	5.9	0.0	5.4	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.3	9.1	0.0	3.0	5.9	0.0	5.4	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	27	1250		147	2140	0	630	520		4	5	29
V/C Ratio(X)	0.44	0.64		0.76	0.42	0.00	0.67	0.00		0.00	0.00	0.07
Avail Cap(c_a), veh/h	203	3053		609	5550	0	1753	1007		664	755	664
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	23.4	12.9	0.0	21.5	9.7	0.0	18.2	0.0	0.0	0.0	0.0	23.1
Incr Delay (d2), s/veh	10.8	0.6	0.0	7.8	0.1	0.0	1.2	0.0	0.0	0.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.8	0.0	1.4	1.6	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	13.5	0.0	29.3	9.8	0.0	19.4	0.0	0.0	0.0	0.0	24.2
LnGrp LOS	C	B		C	A	A	B	A		A	A	C
Approach Vol, veh/h		815			1005			419			2	
Approach Delay, s/veh		13.8			12.0			19.4			24.2	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	17.9	8.5	21.5	13.3	4.6	5.2	24.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	26.0	16.5	41.5	24.5	19.5	5.5	52.5
Max Q Clear Time (g_c+I1), s	0.0	0.0	5.0	11.1	7.4	2.1	2.3	7.9
Green Ext Time (p_c), s	0.0	0.0	0.2	5.9	1.4	0.0	0.0	7.0

Intersection Summary	
HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	28	584	348	23	749	314	9	2	5
v/c Ratio	0.10	0.37	0.39	0.08	0.52	0.36	0.01	0.01	0.01
Control Delay	25.0	10.1	3.1	25.4	13.3	18.5	0.0	27.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	10.1	3.1	25.4	13.3	18.5	0.0	27.5	0.0
Queue Length 50th (ft)	5	34	0	4	47	26	0	0	0
Queue Length 95th (ft)	36	150	50	31	201	105	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	428	3246	1478	383	3164	2145	1384	293	929
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.18	0.24	0.06	0.24	0.15	0.01	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	537	320	21	688	1	289	0	8	2	0	5
Future Volume (veh/h)	26	537	320	21	688	1	289	0	8	2	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	584	0	23	748	1	314	0	9	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	59	1224		50	1235	2	534	322	273	5	0	32
Arrive On Green	0.03	0.35	0.00	0.03	0.34	0.34	0.16	0.00	0.17	0.00	0.00	0.02
Sat Flow, veh/h	1767	3526	1572	1767	3613	5	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	28	584	0	23	365	384	314	0	9	2	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1855	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	0.6	5.2	0.0	0.5	6.9	6.9	3.4	0.0	0.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.6	5.2	0.0	0.5	6.9	6.9	3.4	0.0	0.2	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	1224		50	603	634	534	322	273	5	0	32
V/C Ratio(X)	0.47	0.48		0.46	0.61	0.61	0.59	0.00	0.03	0.41	0.00	0.16
Avail Cap(c_a), veh/h	418	4260		374	2086	2195	2093	1780	1508	286	0	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	10.2	0.0	19.2	11.0	11.0	15.7	0.0	13.8	20.0	0.0	19.3
Incr Delay (d2), s/veh	5.8	0.3	0.0	6.5	1.0	0.9	1.0	0.0	0.0	47.6	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.4	0.0	0.3	2.0	2.1	1.2	0.0	0.1	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	10.5	0.0	25.7	11.9	11.9	16.8	0.0	13.8	67.6	0.0	21.6
LnGrp LOS	C	B		C	B	B	B	A	B	E	A	C
Approach Vol, veh/h		612			772			323			7	
Approach Delay, s/veh		11.2			12.3			16.7			34.7	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	11.5	5.6	18.4	10.8	5.3	5.8	18.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	38.5	8.5	48.5	24.5	20.5	9.5	47.5
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.5	7.2	5.4	2.1	2.6	8.9
Green Ext Time (p_c), s	0.0	0.0	0.0	4.1	1.0	0.0	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	12.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	450	104	13	446	303	65
v/c Ratio	0.37	0.17	0.04	0.32	0.31	0.13
Control Delay	9.3	3.7	14.3	6.7	10.8	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	3.7	14.3	6.7	10.8	5.0
Queue Length 50th (ft)	21	0	1	21	15	0
Queue Length 95th (ft)	81	24	15	45	62	22
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3495	1564	1316	3505	3263	1507
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.07	0.01	0.13	0.09	0.04

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	414	96	12	410	279	60
Future Volume (veh/h)	414	96	12	410	279	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	450	104	13	446	303	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	952	425	263	1957	593	272
Arrive On Green	0.27	0.27	0.15	0.55	0.17	0.17
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	450	104	13	446	303	65
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	3.5	1.7	0.2	2.1	2.7	1.2
Cycle Q Clear(g_c), s	3.5	1.7	0.2	2.1	2.7	1.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	952	425	263	1957	593	272
V/C Ratio(X)	0.47	0.24	0.05	0.23	0.51	0.24
Avail Cap(c_a), veh/h	5063	2258	1095	7728	3991	1830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	9.4	12.1	3.7	12.4	11.8
Incr Delay (d2), s/veh	0.4	0.3	0.1	0.1	0.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.4	0.1	0.2	0.8	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.5	9.7	12.1	3.8	13.1	12.2
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	554			459	368	
Approach Delay, s/veh	10.3			4.0	12.9	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	10.2	9.4	13.4	22.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	38.5	20.5	47.5	72.5
Max Q Clear Time (g_c+I1), s	4.7	2.2	5.5	4.1
Green Ext Time (p_c), s	1.3	0.0	3.4	3.1

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	431	68	578	16	2	25	71	26
v/c Ratio	0.05	0.21	0.13	0.23	0.01	0.00	0.05	0.12	0.05
Control Delay	17.7	10.0	15.9	6.0	0.4	15.0	9.0	14.9	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	10.0	15.9	6.0	0.4	15.0	9.0	14.9	8.3
Queue Length 50th (ft)	5	40	13	27	0	0	1	13	0
Queue Length 95th (ft)	23	80	45	100	2	5	16	44	15
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	1072	3477	1263	3505	1568	1582	1376	1582	1358
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.12	0.05	0.16	0.01	0.00	0.02	0.04	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	392	5	63	532	15	2	3	20	65	1	23
Future Volume (veh/h)	22	392	5	63	532	15	2	3	20	65	1	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	426	5	68	578	16	2	3	22	71	1	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1151	14	130	1290	575	395	21	157	396	7	169
Arrive On Green	0.03	0.32	0.32	0.07	0.37	0.37	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3569	42	1767	3526	1572	1374	192	1410	1375	61	1521
Grp Volume(v), veh/h	24	210	221	68	578	16	2	0	25	71	0	26
Grp Sat Flow(s),veh/h/ln	1767	1763	1848	1767	1763	1572	1374	0	1602	1375	0	1582
Q Serve(g_s), s	0.4	2.5	2.5	1.0	3.4	0.2	0.0	0.0	0.4	1.3	0.0	0.4
Cycle Q Clear(g_c), s	0.4	2.5	2.5	1.0	3.4	0.2	0.4	0.0	0.4	1.7	0.0	0.4
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	54	569	596	130	1290	575	395	0	178	396	0	176
V/C Ratio(X)	0.45	0.37	0.37	0.52	0.45	0.03	0.01	0.00	0.14	0.18	0.00	0.15
Avail Cap(c_a), veh/h	999	3182	3336	1514	7393	3297	1920	0	1957	1923	0	1932
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.1	7.1	7.1	12.2	6.6	5.6	11.2	0.0	11.0	11.8	0.0	11.0
Incr Delay (d2), s/veh	5.7	0.4	0.4	3.2	0.2	0.0	0.0	0.0	0.4	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.6	0.6	0.4	0.7	0.0	0.0	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	7.5	7.5	15.4	6.8	5.6	11.2	0.0	11.4	12.0	0.0	11.4
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		455			662			27			97	
Approach Delay, s/veh		8.1			7.7			11.3			11.8	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		7.6	6.5	13.3		7.6	5.3	14.5
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.5	23.5	49.5		33.5	15.5	57.5
Max Q Clear Time (g_c+I1), s		2.4	3.0	4.5		3.7	2.4	5.4
Green Ext Time (p_c), s		0.1	0.1	2.8		0.3	0.0	4.6

Intersection Summary			
HCM 6th Ctrl Delay			8.3
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	280	207	381	28	23	93	58	14	20
v/c Ratio	0.12	0.22	0.37	0.22	0.08	0.06	0.22	0.15	0.03	0.04
Control Delay	24.5	19.1	20.5	12.1	25.3	25.6	4.1	24.1	22.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	19.1	20.5	12.1	25.3	25.6	4.1	24.1	22.5	0.2
Queue Length 50th (ft)	13	40	58	43	8	7	0	17	3	0
Queue Length 95th (ft)	45	84	129	85	32	28	20	52	20	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	684	1925	1219	2819	872	1059	958	925	1115	1001
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.15	0.17	0.14	0.03	0.02	0.10	0.06	0.01	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	223	35	190	252	98	26	21	86	53	13	18
Future Volume (veh/h)	42	223	35	190	252	98	26	21	86	53	13	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	242	38	207	274	107	28	23	93	58	14	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	89	492	76	280	672	256	199	248	210	164	211	178
Arrive On Green	0.05	0.16	0.16	0.16	0.27	0.27	0.11	0.13	0.13	0.09	0.11	0.11
Sat Flow, veh/h	1767	3059	474	1767	2496	951	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	46	138	142	207	192	189	28	23	93	58	14	20
Grp Sat Flow(s),veh/h/ln	1767	1763	1770	1767	1763	1684	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	1.0	2.8	2.9	4.4	3.5	3.7	0.6	0.4	2.2	1.2	0.3	0.5
Cycle Q Clear(g_c), s	1.0	2.8	2.9	4.4	3.5	3.7	0.6	0.4	2.2	1.2	0.3	0.5
Prop In Lane	1.00		0.27	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	89	283	285	280	475	454	199	248	210	164	211	178
V/C Ratio(X)	0.52	0.49	0.50	0.74	0.40	0.42	0.14	0.09	0.44	0.35	0.07	0.11
Avail Cap(c_a), veh/h	558	1046	1050	1450	1936	1850	870	1148	973	959	1242	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	15.1	15.2	15.9	11.9	11.9	15.8	15.1	15.8	16.9	15.7	15.8
Incr Delay (d2), s/veh	4.6	1.3	1.4	3.8	0.6	0.6	0.3	0.2	1.5	1.3	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.1	1.1	1.8	1.2	1.2	0.2	0.2	0.7	0.5	0.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.0	16.4	16.5	19.7	12.4	12.5	16.2	15.2	17.3	18.2	15.8	16.0
LnGrp LOS	C	B	B	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		326			588			144			92	
Approach Delay, s/veh		17.4			15.0			16.7			17.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	9.8	10.8	10.9	9.0	9.0	6.5	15.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	24.5	32.5	23.5	19.5	26.5	12.5	43.5
Max Q Clear Time (g_c+I1), s	3.2	4.2	6.4	4.9	2.6	2.5	3.0	5.7
Green Ext Time (p_c), s	0.1	0.3	0.6	1.5	0.0	0.1	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	135	19	644	55	279
v/c Ratio	0.15	0.05	0.36	0.13	0.13
Control Delay	15.1	9.5	7.7	16.4	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	9.5	7.7	16.4	3.9
Queue Length 50th (ft)	8	0	23	7	11
Queue Length 95th (ft)	37	15	95	39	23
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2609	1098	3323	1109	3505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.19	0.05	0.08

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	122	19	388	204	51	257
Future Volume (veh/h)	122	19	388	204	51	257
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	133	21	422	222	55	279
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	424	189	833	434	108	2052
Arrive On Green	0.12	0.12	0.37	0.37	0.06	0.58
Sat Flow, veh/h	3534	1572	2334	1167	1767	3618
Grp Volume(v), veh/h	133	21	331	313	55	279
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1645	1767	1763
Q Serve(g_s), s	1.0	0.4	4.4	4.5	0.9	1.1
Cycle Q Clear(g_c), s	1.0	0.4	4.4	4.5	0.9	1.1
Prop In Lane	1.00	1.00		0.71	1.00	
Lane Grp Cap(c), veh/h	424	189	656	612	108	2052
V/C Ratio(X)	0.31	0.11	0.50	0.51	0.51	0.14
Avail Cap(c_a), veh/h	2983	1327	3589	3350	1141	9978
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	11.9	7.3	7.4	13.7	2.9
Incr Delay (d2), s/veh	0.4	0.3	0.6	0.7	3.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	1.1	1.0	0.4	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.6	12.1	7.9	8.0	17.4	2.9
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	154		644			334
Approach Delay, s/veh	12.5		8.0			5.3
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.3	15.7				22.1		8.1
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	19.5	61.5				85.5		25.5
Max Q Clear Time (g_c+I1), s	2.9	6.5				3.1		3.0
Green Ext Time (p_c), s	0.1	4.8				2.0		0.5

Intersection Summary		
HCM 6th Ctrl Delay		7.8
HCM 6th LOS		A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	141	104	310	117	54
v/c Ratio	0.27	0.06	0.33	0.14	0.14
Control Delay	13.6	3.7	6.5	12.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	3.7	6.5	12.7	6.5
Queue Length 50th (ft)	23	3	9	8	0
Queue Length 95th (ft)	60	10	34	26	21
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1723	3505	3067	2979	1268
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.03	0.10	0.04	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	130	96	100	185	96	62		
Future Volume (veh/h)	130	96	100	185	96	62		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	141	104	109	201	113	57		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	213	1886	438	390	471	209		
Arrive On Green	0.12	0.53	0.25	0.25	0.13	0.13		
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572		
Grp Volume(v), veh/h	141	104	109	201	113	57		
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572		
Q Serve(g_s), s	2.1	0.4	1.3	3.0	0.8	0.9		
Cycle Q Clear(g_c), s	2.1	0.4	1.3	3.0	0.8	0.9		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	213	1886	438	390	471	209		
V/C Ratio(X)	0.66	0.06	0.25	0.52	0.24	0.27		
Avail Cap(c_a), veh/h	2510	10339	2373	2117	4107	1827		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	11.4	3.0	8.2	8.8	10.5	10.6		
Incr Delay (d2), s/veh	3.5	0.0	0.3	1.1	0.3	0.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.4	0.8	0.2	0.0		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	14.9	3.0	8.5	9.8	10.8	11.3		
LnGrp LOS	B	A	A	A	B	B		
Approach Vol, veh/h		245	310		170			
Approach Delay, s/veh		9.8	9.4		10.9			
Approach LOS		A	A		B			
Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				19.0		8.1	7.8	11.2
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				79.5		31.5	38.5	36.5
Max Q Clear Time (g_c+I1), s				2.4		2.9	4.1	5.0
Green Ext Time (p_c), s				0.7		0.5	0.4	2.1
Intersection Summary								
HCM 6th Ctrl Delay			9.9					
HCM 6th LOS			A					

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	8	138	4	33	235	270	10	363
v/c Ratio	0.11	0.02	0.34	0.02	0.13	0.47	0.12	0.04	0.42
Control Delay	25.4	21.6	8.0	26.8	15.8	20.7	7.3	26.3	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	21.6	8.0	26.8	15.8	20.7	7.3	26.3	18.8
Queue Length 50th (ft)	7	2	0	1	2	47	9	2	37
Queue Length 95th (ft)	35	14	45	10	27	147	60	17	106
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	443	1090	983	316	859	1424	3416	316	2420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.01	0.14	0.01	0.04	0.17	0.08	0.03	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	7	127	4	7	23	216	244	5	9	284	50
Future Volume (veh/h)	28	7	127	4	7	23	216	244	5	9	284	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	30	8	138	4	8	25	235	265	5	10	309	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	63	265	224	10	44	139	318	1297	24	23	601	104
Arrive On Green	0.04	0.14	0.14	0.01	0.11	0.11	0.18	0.37	0.37	0.01	0.20	0.20
Sat Flow, veh/h	1767	1856	1572	1767	396	1237	1767	3540	67	1767	3006	519
Grp Volume(v), veh/h	30	8	138	4	0	33	235	132	138	10	180	183
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1633	1767	1763	1844	1767	1763	1762
Q Serve(g_s), s	0.6	0.1	3.1	0.1	0.0	0.7	4.8	2.0	2.0	0.2	3.5	3.5
Cycle Q Clear(g_c), s	0.6	0.1	3.1	0.1	0.0	0.7	4.8	2.0	2.0	0.2	3.5	3.5
Prop In Lane	1.00		1.00	1.00		0.76	1.00		0.04	1.00		0.29
Lane Grp Cap(c), veh/h	63	265	224	10	0	183	318	646	676	23	352	352
V/C Ratio(X)	0.48	0.03	0.62	0.42	0.00	0.18	0.74	0.20	0.20	0.43	0.51	0.52
Avail Cap(c_a), veh/h	487	1193	1011	348	0	921	1785	2891	3023	348	1457	1456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	14.1	15.4	18.9	0.0	15.3	14.8	8.3	8.3	18.7	13.6	13.6
Incr Delay (d2), s/veh	5.5	0.0	2.7	26.2	0.0	0.5	3.4	0.2	0.1	12.0	1.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	1.1	0.1	0.0	0.2	1.8	0.5	0.6	0.2	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	14.1	18.1	45.1	0.0	15.8	18.2	8.4	8.4	30.7	14.7	14.8
LnGrp LOS	C	B	B	D	A	B	B	A	A	C	B	B
Approach Vol, veh/h		176			37			505			373	
Approach Delay, s/veh		18.8			19.0			13.0			15.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.0	18.5	4.7	9.9	11.4	12.1	5.9	8.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	62.5	7.5	24.5	38.5	31.5	10.5	21.5
Max Q Clear Time (g_c+I1), s	2.2	4.0	2.1	5.1	6.8	5.5	2.6	2.7
Green Ext Time (p_c), s	0.0	1.6	0.0	0.4	0.7	2.1	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	157	870	141	326	527	352	196	347
v/c Ratio	0.67	0.90	0.78	0.41	0.90	0.33	0.71	0.68
Control Delay	60.4	45.6	78.0	38.2	54.9	28.8	59.0	42.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	45.6	78.0	38.2	54.9	28.8	59.0	42.6
Queue Length 50th (ft)	111	274	103	103	354	95	139	101
Queue Length 95th (ft)	185	#420	#222	162	#583	145	219	151
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	310	1015	187	798	661	1224	375	696
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.86	0.75	0.41	0.80	0.29	0.52	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	446	354	130	257	43	485	275	49	180	204	115
Future Volume (veh/h)	144	446	354	130	257	43	485	275	49	180	204	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	157	485	0	141	279	0	527	299	0	196	222	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	201	703		179	659		592	1059		246	368	
Arrive On Green	0.11	0.20	0.00	0.10	0.19	0.00	0.34	0.30	0.00	0.14	0.10	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	157	485	0	141	279	0	527	299	0	196	222	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	6.0	8.8	0.0	5.4	4.8	0.0	19.6	4.5	0.0	7.4	4.2	0.0
Cycle Q Clear(g_c), s	6.0	8.8	0.0	5.4	4.8	0.0	19.6	4.5	0.0	7.4	4.2	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	201	703		179	659		592	1059		246	368	
V/C Ratio(X)	0.78	0.69		0.79	0.42		0.89	0.28		0.80	0.60	
Avail Cap(c_a), veh/h	485	1502		294	1120		1034	1935		587	1044	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.9	25.7	0.0	30.4	24.8	0.0	21.8	18.5	0.0	28.9	29.6	0.0
Incr Delay (d2), s/veh	6.5	1.2	0.0	7.5	0.4	0.0	5.1	0.1	0.0	5.8	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.6	0.0	2.5	1.9	0.0	8.1	1.7	0.0	3.4	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.4	27.0	0.0	37.9	25.3	0.0	26.9	18.7	0.0	34.7	31.2	0.0
LnGrp LOS	D	C		D	C		C	B		C	C	
Approach Vol, veh/h		642			420			826			418	
Approach Delay, s/veh		29.3			29.5			24.0			32.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	25.3	11.5	18.3	27.7	11.7	12.4	17.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.0	38.0	11.5	29.5	40.5	20.5	19.0	22.0
Max Q Clear Time (g_c+I1), s	9.4	6.5	7.4	10.8	21.6	6.2	8.0	6.8
Green Ext Time (p_c), s	0.4	2.0	0.1	3.0	1.6	1.1	0.3	1.4

Intersection Summary	
HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	743	434	493	338	528
v/c Ratio	0.77	0.81	0.22	0.73	0.66
Control Delay	36.5	44.3	8.1	43.3	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	44.3	8.1	43.3	7.2
Queue Length 50th (ft)	197	242	60	189	0
Queue Length 95th (ft)	335	426	106	334	89
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1239	787	2827	708	948
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.55	0.17	0.48	0.56

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	455	228	399	454	311	486
Future Volume (veh/h)	455	228	399	454	311	486
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	495	248	434	493	338	528
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	582	290	475	2002	609	542
Arrive On Green	0.26	0.26	0.27	0.57	0.34	0.34
Sat Flow, veh/h	2371	1136	1767	3618	1767	1572
Grp Volume(v), veh/h	383	360	434	493	338	528
Grp Sat Flow(s),veh/h/ln	1763	1651	1767	1763	1767	1572
Q Serve(g_s), s	21.2	21.4	24.5	7.2	16.0	34.1
Cycle Q Clear(g_c), s	21.2	21.4	24.5	7.2	16.0	34.1
Prop In Lane		0.69	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	450	422	475	2002	609	542
V/C Ratio(X)	0.85	0.86	0.91	0.25	0.55	0.97
Avail Cap(c_a), veh/h	539	505	678	2586	609	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	36.5	36.5	11.2	27.3	33.3
Incr Delay (d2), s/veh	10.6	11.8	13.1	0.1	1.1	31.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	9.8	12.0	2.7	6.8	17.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.1	48.3	49.6	11.2	28.4	65.2
LnGrp LOS	D	D	D	B	C	E
Approach Vol, veh/h	743			927	866	
Approach Delay, s/veh	47.7			29.2	50.8	
Approach LOS	D			C	D	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		40.0	32.2	30.8				62.9
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		35.5	39.5	31.5				75.5
Max Q Clear Time (g_c+I1), s		36.1	26.5	23.4				9.2
Green Ext Time (p_c), s		0.0	1.1	2.9				3.6

Intersection Summary		
HCM 6th Ctrl Delay		42.0
HCM 6th LOS		D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	25	791	96	759	135	97
v/c Ratio	0.11	0.58	0.31	0.42	0.43	0.15
Control Delay	28.1	15.7	26.6	10.1	26.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	15.7	26.6	10.1	26.2	0.5
Queue Length 50th (ft)	7	101	27	51	38	0
Queue Length 95th (ft)	33	195	82	165	104	0
Internal Link Dist (ft)		424		851		1161
Turn Bay Length (ft)	125		125		75	
Base Capacity (vph)	343	3100	706	3383	944	1175
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.14	0.22	0.14	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	617	110	88	697	1	124	0	89	0	0	0
Future Volume (veh/h)	23	617	110	88	697	1	124	0	89	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	671	120	96	758	1	135	0	97	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1174	210	153	1619	2	449	0	219	204	258	0
Arrive On Green	0.03	0.39	0.39	0.09	0.45	0.45	0.14	0.00	0.14	0.00	0.00	0.00
Sat Flow, veh/h	1767	2988	534	1767	3613	5	1767	0	1572	1288	1856	0
Grp Volume(v), veh/h	25	396	395	96	370	389	135	0	97	0	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1759	1767	1763	1855	1767	0	1572	1288	1856	0
Q Serve(g_s), s	0.5	6.2	6.2	1.9	5.2	5.2	2.5	0.0	2.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	6.2	6.2	1.9	5.2	5.2	2.5	0.0	2.0	0.0	0.0	0.0
Prop In Lane	1.00		0.30	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	54	692	691	153	790	831	449	0	219	204	258	0
V/C Ratio(X)	0.46	0.57	0.57	0.63	0.47	0.47	0.30	0.00	0.44	0.00	0.00	0.00
Avail Cap(c_a), veh/h	475	2618	2613	975	3117	3279	1928	0	1535	1282	1811	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	16.8	8.4	8.4	15.6	6.8	6.8	14.2	0.0	14.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.9	0.7	0.8	4.2	0.4	0.4	0.4	0.0	1.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.6	1.6	0.8	1.2	1.2	0.9	0.0	0.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	9.1	9.2	19.8	7.2	7.2	14.6	0.0	15.4	0.0	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	B	A	B	A	A	A
Approach Vol, veh/h		816			855			232			0	
Approach Delay, s/veh		9.6			8.6			14.9			0.0	
Approach LOS		A			A			B				

Timer - Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.4	7.6	18.4		9.4	5.6	20.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		34.5	19.5	52.5		34.5	9.5	62.5
Max Q Clear Time (g_c+I1), s		4.5	3.9	8.2		0.0	2.5	7.2
Green Ext Time (p_c), s		1.0	0.2	5.7		0.0	0.0	5.3

Intersection Summary			
HCM 6th Ctrl Delay			9.8
HCM 6th LOS			A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	433	480	646	228	91	1092
v/c Ratio	0.56	0.27	0.75	0.41	0.07	0.58
Control Delay	42.6	15.6	44.7	6.5	22.0	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.0
Total Delay	42.6	15.6	44.7	6.5	22.0	12.9
Queue Length 50th (ft)	144	98	227	0	20	197
Queue Length 95th (ft)	211	130	292	58	40	314
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	772	2046	1108	651	1378	1890
Starvation Cap Reductn	0	0	0	0	0	613
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.23	0.58	0.35	0.07	0.86

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	390	432	581	205	82	983
Future Volume (veh/h)	390	432	581	205	82	983
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	433	480	646	228	91	1092
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	796	1777	814	363	1420	1788
Arrive On Green	0.23	0.50	0.23	0.23	0.41	0.41
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768
Grp Volume(v), veh/h	433	480	646	228	91	1092
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384
Q Serve(g_s), s	12.2	8.6	19.0	14.3	1.8	25.3
Cycle Q Clear(g_c), s	12.2	8.6	19.0	14.3	1.8	25.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	796	1777	814	363	1420	1788
V/C Ratio(X)	0.54	0.27	0.79	0.63	0.06	0.61
Avail Cap(c_a), veh/h	796	2102	1139	508	1420	1788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	15.6	39.8	38.0	19.4	11.4
Incr Delay (d2), s/veh	2.7	0.1	2.7	1.8	0.1	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	3.4	8.3	12.5	0.7	22.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.7	15.7	42.4	39.8	19.5	12.9
LnGrp LOS	D	B	D	D	B	B
Approach Vol, veh/h		913	874		1183	
Approach Delay, s/veh		27.1	41.7		13.4	
Approach LOS		C	D		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				59.9		50.0	30.0	29.9
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5		45.5	25.5	35.5
Max Q Clear Time (g_c+I1), s				10.6		27.3	14.2	21.0
Green Ext Time (p_c), s				3.5		5.3	1.2	4.4

Intersection Summary			
HCM 6th Ctrl Delay			26.0
HCM 6th LOS			C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	96	646	1129	213	142	187
v/c Ratio	0.72	0.27	0.81	0.34	0.09	0.24
Control Delay	91.3	20.5	39.4	28.1	21.8	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.3	20.5	39.4	28.1	21.8	10.5
Queue Length 50th (ft)	41	116	432	122	32	33
Queue Length 95th (ft)	#100	142	513	183	65	97
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	133	3258	2006	897	1559	781
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.20	0.56	0.24	0.09	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	581	1016	192	128	168
Future Volume (veh/h)	86	581	1016	192	128	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	96	646	1129	213	142	187
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	136	2360	1377	614	1587	728
Arrive On Green	0.04	0.47	0.39	0.39	0.46	0.46
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	96	646	1129	213	142	187
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	3.5	9.9	36.3	12.1	2.9	9.2
Cycle Q Clear(g_c), s	3.5	9.9	36.3	12.1	2.9	9.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	136	2360	1377	614	1587	728
V/C Ratio(X)	0.71	0.27	0.82	0.35	0.09	0.26
Avail Cap(c_a), veh/h	136	3307	2037	908	1587	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	20.7	34.5	27.1	19.0	20.7
Incr Delay (d2), s/veh	26.7	0.1	1.8	0.3	0.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.9	15.5	4.6	1.2	10.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	86.7	20.7	36.3	27.5	19.1	21.5
LnGrp LOS	F	C	D	C	B	C
Approach Vol, veh/h		742	1342		329	
Approach Delay, s/veh		29.3	34.9		20.5	
Approach LOS		C	C		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		63.4		63.0	9.5	53.9
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		11.9		11.2	5.5	38.3
Green Ext Time (p_c), s		5.0		1.2	0.0	11.1

Intersection Summary		
HCM 6th Ctrl Delay		31.2
HCM 6th LOS		C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	83	402	98	215	272
v/c Ratio	0.10	0.20	0.28	0.14	0.36	0.11
Control Delay	18.7	7.4	13.6	4.7	15.8	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	7.4	13.6	4.7	15.8	3.1
Queue Length 50th (ft)	8	0	41	0	42	10
Queue Length 95th (ft)	33	30	85	26	104	21
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1153	1060	3126	1409	1646	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.08	0.13	0.07	0.13	0.08

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	37	76	370	90	198	250		
Future Volume (veh/h)	37	76	370	90	198	250		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No		No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	40	83	402	98	215	272		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	187	167	908	405	343	2112		
Arrive On Green	0.11	0.11	0.26	0.26	0.19	0.60		
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618		
Grp Volume(v), veh/h	40	83	402	98	215	272		
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763		
Q Serve(g_s), s	0.6	1.5	2.9	1.5	3.4	1.0		
Cycle Q Clear(g_c), s	0.6	1.5	2.9	1.5	3.4	1.0		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	187	167	908	405	343	2112		
V/C Ratio(X)	0.21	0.50	0.44	0.24	0.63	0.13		
Avail Cap(c_a), veh/h	1477	1314	4448	1984	2461	9877		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	12.5	12.9	9.5	9.0	11.3	2.7		
Incr Delay (d2), s/veh	0.6	2.3	0.3	0.3	1.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.7	0.3	1.0	0.0		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	13.0	15.2	9.8	9.3	13.2	2.7		
LnGrp LOS	B	B	A	A	B	A		
Approach Vol, veh/h	123		500			487		
Approach Delay, s/veh	14.5		9.7			7.3		
Approach LOS	B		A			A		
Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.4	12.4				22.8		7.7
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	42.5	38.5				85.5		25.5
Max Q Clear Time (g_c+I1), s	5.4	4.9				3.0		3.5
Green Ext Time (p_c), s	0.6	3.0				1.8		0.3
Intersection Summary								
HCM 6th Ctrl Delay			9.2					
HCM 6th LOS			A					

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	70	108	170	168	113	43	356	103	140	603
v/c Ratio	0.26	0.34	0.44	0.39	0.24	0.18	0.44	0.33	0.25	0.67
Control Delay	30.6	28.4	28.7	26.0	5.0	31.6	23.4	29.9	21.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	28.4	28.7	26.0	5.0	31.6	23.4	29.9	21.0	6.5
Queue Length 50th (ft)	23	33	56	53	0	15	57	34	42	0
Queue Length 95th (ft)	72	94	138	129	29	52	120	95	101	79
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	411	717	804	1064	962	303	2578	553	1543	1410
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.15	0.21	0.16	0.12	0.14	0.14	0.19	0.09	0.43

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	81	18	156	155	104	40	281	47	95	129	555
Future Volume (veh/h)	64	81	18	156	155	104	40	281	47	95	129	555
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	88	20	170	168	113	43	305	51	103	140	603
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	101	142	32	221	306	259	75	1225	202	135	813	689
Arrive On Green	0.06	0.10	0.10	0.12	0.16	0.16	0.04	0.40	0.40	0.08	0.44	0.44
Sat Flow, veh/h	1767	1463	333	1767	1856	1572	1767	3028	501	1767	1856	1572
Grp Volume(v), veh/h	70	0	108	170	168	113	43	176	180	103	140	603
Grp Sat Flow(s),veh/h/ln	1767	0	1796	1767	1856	1572	1767	1763	1765	1767	1856	1572
Q Serve(g_s), s	2.4	0.0	3.5	5.6	5.0	3.9	1.4	4.0	4.1	3.5	2.8	21.2
Cycle Q Clear(g_c), s	2.4	0.0	3.5	5.6	5.0	3.9	1.4	4.0	4.1	3.5	2.8	21.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	101	0	175	221	306	259	75	713	714	135	813	689
V/C Ratio(X)	0.69	0.00	0.62	0.77	0.55	0.44	0.57	0.25	0.25	0.76	0.17	0.87
Avail Cap(c_a), veh/h	335	0	578	656	934	792	248	1295	1297	452	1577	1337
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	26.3	25.7	23.2	22.8	28.5	11.9	12.0	27.4	10.3	15.5
Incr Delay (d2), s/veh	8.2	0.0	3.5	5.6	1.5	1.2	6.7	0.2	0.2	8.6	0.1	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.6	2.6	2.2	1.4	0.7	1.4	1.5	1.7	1.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	0.0	29.8	31.3	24.8	23.9	35.2	12.1	12.1	36.1	10.4	19.2
LnGrp LOS	D	A	C	C	C	C	D	B	B	D	B	B
Approach Vol, veh/h		178			451			399			846	
Approach Delay, s/veh		32.3			27.0			14.6			19.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.1	29.0	12.1	10.4	7.1	31.1	8.0	14.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	44.5	22.5	19.5	8.5	51.5	11.5	30.5
Max Q Clear Time (g_c+I1), s	5.5	6.1	7.6	5.5	3.4	23.2	4.4	7.0
Green Ext Time (p_c), s	0.2	2.3	0.4	0.4	0.0	3.4	0.1	1.3

Intersection Summary		
HCM 6th Ctrl Delay		21.6
HCM 6th LOS		C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	476	1007	636	40	1692	235
v/c Ratio	0.44	0.84	0.31	0.04	0.82	0.15
Control Delay	31.5	25.2	11.8	3.4	21.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	25.2	11.8	3.4	21.9	0.2
Queue Length 50th (ft)	130	198	104	0	440	0
Queue Length 95th (ft)	222	369	179	16	708	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1658	1591	2797	1259	2797	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.63	0.23	0.03	0.60	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	438	0	926	0	585	37	0	1557	216
Future Volume (veh/h)	0	0	0	438	0	926	0	585	37	0	1557	216
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				476	0	1007	0	636	40	0	1692	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1286	0	1038	0	1952	871	0	1952	
Arrive On Green				0.38	0.00	0.38	0.00	0.55	0.55	0.00	0.55	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				476	0	1007	0	636	40	0	1692	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				12.7	0.0	45.2	0.0	12.4	1.5	0.0	52.0	0.0
Cycle Q Clear(g_c), s				12.7	0.0	45.2	0.0	12.4	1.5	0.0	52.0	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1286	0	1038	0	1952	871	0	1952	
V/C Ratio(X)				0.37	0.00	0.97	0.00	0.33	0.05	0.00	0.87	
Avail Cap(c_a), veh/h				1289	0	1040	0	2330	1039	0	2330	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				28.7	0.0	38.8	0.0	15.4	12.9	0.0	24.2	0.0
Incr Delay (d2), s/veh				0.2	0.0	20.9	0.0	0.1	0.0	0.0	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.2	0.0	17.7	0.0	4.8	0.5	0.0	21.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				28.8	0.0	59.7	0.0	15.5	12.9	0.0	27.5	0.0
LnGrp LOS				C	A	E	A	B	B	A	C	
Approach Vol, veh/h					1483			676			1692	
Approach Delay, s/veh					49.8			15.3			27.5	
Approach LOS					D			B			C	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		74.5				74.5		51.9				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		83.5				83.5		47.5				
Max Q Clear Time (g_c+I1), s		14.4				54.0		47.2				
Green Ext Time (p_c), s		4.8				15.9		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			33.9									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	26	745	1093	173	802	1321	265	1	2
v/c Ratio	0.24	0.81	0.70	0.78	0.43	0.83	0.26	0.01	0.01
Control Delay	49.0	41.4	2.6	65.6	24.5	27.8	0.6	43.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	41.4	2.6	65.6	24.5	27.8	0.6	43.0	0.0
Queue Length 50th (ft)	16	225	0	105	143	350	0	1	0
Queue Length 95th (ft)	42	296	0	#211	182	444	0	6	0
Internal Link Dist (ft)		1084			414		644		
Turn Bay Length (ft)	230			215		425		100	
Base Capacity (vph)	110	923	1568	222	1869	1598	1035	325	226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.81	0.70	0.78	0.43	0.83	0.26	0.00	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	745	1093	173	801	1	1321	0	265	1	0	2
Future Volume (veh/h)	26	745	1093	173	801	1	1321	0	265	1	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	26	745	0	173	801	1	1321	0	0	1	0	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	47	875		207	1771	2	1475	703		98	7	48
Arrive On Green	0.03	0.25	0.00	0.12	0.34	0.34	0.43	0.00	0.00	0.06	0.00	0.00
Sat Flow, veh/h	1767	3526	1572	1767	5225	7	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	26	745	0	173	518	284	1321	0	0	1	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1854	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	1.3	18.1	0.0	8.6	10.8	10.8	32.1	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.3	18.1	0.0	8.6	10.8	10.8	32.1	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	47	875		207	1144	628	1475	703		98	7	48
V/C Ratio(X)	0.55	0.85		0.83	0.45	0.45	0.90	0.00		0.01	0.00	0.04
Avail Cap(c_a), veh/h	120	1000		242	1191	654	1735	954		354	386	369
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.2	32.2	0.0	38.8	23.2	23.2	23.7	0.0	0.0	40.1	0.0	42.3
Incr Delay (d2), s/veh	9.8	6.5	0.0	19.3	0.3	0.5	5.8	0.0	0.0	0.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	8.1	0.0	4.7	4.1	4.5	13.4	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.0	38.7	0.0	58.1	23.5	23.7	29.5	0.0	0.0	40.2	0.0	42.6
LnGrp LOS	D	D		E	C	C	C	A		D	A	D
Approach Vol, veh/h		771			975			1321			3	
Approach Delay, s/veh		39.2			29.7			29.5			41.8	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	38.5	15.0	26.8	43.2	4.9	6.9	35.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	46.2	12.3	25.5	45.5	18.7	6.1	31.7
Max Q Clear Time (g_c+I1), s	2.0	0.0	10.6	20.1	34.1	2.1	3.3	12.8
Green Ext Time (p_c), s	0.0	0.0	0.1	2.2	4.6	0.0	0.0	4.7

Intersection Summary	
HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	70	849	287	39	815	195	34	2	5
v/c Ratio	0.23	0.49	0.31	0.14	0.54	0.29	0.06	0.01	0.01
Control Delay	26.1	11.2	2.9	27.3	13.8	23.2	0.2	30.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	11.2	2.9	27.3	13.8	23.2	0.2	30.0	0.0
Queue Length 50th (ft)	18	48	0	10	93	25	0	1	0
Queue Length 95th (ft)	70	219	42	47	220	77	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	591	3246	1473	428	3162	1385	1184	265	845
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.26	0.19	0.09	0.26	0.14	0.03	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	781	264	36	750	0	179	0	31	2	0	5
Future Volume (veh/h)	64	781	264	36	750	0	179	0	31	2	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	849	0	39	815	0	195	0	34	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	116	1403		76	1325	0	355	270	229	5	0	70
Arrive On Green	0.07	0.40	0.00	0.04	0.38	0.00	0.10	0.00	0.15	0.00	0.00	0.04
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	70	849	0	39	815	0	195	0	34	2	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.7	8.4	0.0	0.9	8.2	0.0	2.4	0.0	0.8	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.7	8.4	0.0	0.9	8.2	0.0	2.4	0.0	0.8	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	116	1403		76	1325	0	355	270	229	5	0	70
V/C Ratio(X)	0.61	0.61		0.51	0.62	0.00	0.55	0.00	0.15	0.41	0.00	0.07
Avail Cap(c_a), veh/h	585	4383		423	4061	0	1369	1291	1094	262	0	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	10.5	0.0	20.5	11.1	0.0	18.7	0.0	16.4	21.8	0.0	20.1
Incr Delay (d2), s/veh	5.0	0.4	0.0	5.2	0.5	0.0	1.3	0.0	0.3	47.7	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.3	0.0	0.4	2.3	0.0	0.9	0.0	0.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	10.9	0.0	25.7	11.6	0.0	20.0	0.0	16.7	69.5	0.0	20.5
LnGrp LOS	C	B		C	B	A	C	A	B	E	A	C
Approach Vol, veh/h		919			854			229			7	
Approach Delay, s/veh		12.0			12.2			19.5			34.5	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	10.9	6.4	21.9	9.0	6.5	7.4	21.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	10.5	54.5	17.5	19.5	14.5	50.5
Max Q Clear Time (g_c+I1), s	2.0	2.8	2.9	10.4	4.4	2.1	3.7	10.2
Green Ext Time (p_c), s	0.0	0.1	0.0	6.6	0.5	0.0	0.1	6.2

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	579	271	50	646	154	27
v/c Ratio	0.31	0.28	0.12	0.29	0.17	0.06
Control Delay	9.0	2.8	16.9	4.6	15.3	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	2.8	16.9	4.6	15.3	8.8
Queue Length 50th (ft)	26	0	6	31	9	0
Queue Length 95th (ft)	101	36	37	56	41	16
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1313	3505	2769	1282
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.04	0.18	0.06	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	533	249	46	594	142	25
Future Volume (veh/h)	533	249	46	594	142	25
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	579	271	50	646	154	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1215	542	256	2185	409	188
Arrive On Green	0.34	0.34	0.14	0.62	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	579	271	50	646	154	27
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	4.4	4.7	0.9	2.9	1.4	0.5
Cycle Q Clear(g_c), s	4.4	4.7	0.9	2.9	1.4	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1215	542	256	2185	409	188
V/C Ratio(X)	0.48	0.50	0.20	0.30	0.38	0.14
Avail Cap(c_a), veh/h	5364	2392	1306	8428	2831	1299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	9.0	13.0	3.1	14.0	13.6
Incr Delay (d2), s/veh	0.3	0.7	0.4	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.1	0.3	0.1	0.4	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.7	13.4	3.1	14.6	14.0
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	850			696	181	
Approach Delay, s/veh	9.3			3.9	14.5	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.6	9.5	16.4				25.9
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		28.5	25.5	52.5				82.5
Max Q Clear Time (g_c+I1), s		3.4	2.9	6.7				4.9
Green Ext Time (p_c), s		0.6	0.1	5.2				4.8

Intersection Summary	
HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1331	203	979	40	17	185	133	91
v/c Ratio	0.43	0.81	0.67	0.48	0.04	0.07	0.40	0.72	0.24
Control Delay	54.1	27.2	51.7	14.5	2.2	34.7	9.8	59.9	13.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	27.3	51.7	14.5	2.2	34.7	9.8	59.9	13.2
Queue Length 50th (ft)	45	350	121	184	0	9	7	79	8
Queue Length 95th (ft)	106	567	231	307	11	30	65	161	51
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	238	2139	423	2476	1124	441	657	316	603
Starvation Cap Reductn	0	92	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.65	0.48	0.40	0.04	0.04	0.28	0.42	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	1188	37	187	901	37	16	12	158	122	15	69
Future Volume (veh/h)	69	1188	37	187	901	37	16	12	158	122	15	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	1291	40	203	979	40	17	13	172	133	16	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	97	1620	50	245	1931	861	336	27	355	250	68	319
Arrive On Green	0.05	0.46	0.46	0.14	0.55	0.55	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1767	3491	108	1767	3526	1572	1295	112	1478	1189	284	1332
Grp Volume(v), veh/h	75	651	680	203	979	40	17	0	185	133	0	91
Grp Sat Flow(s),veh/h/ln	1767	1763	1836	1767	1763	1572	1295	0	1590	1189	0	1616
Q Serve(g_s), s	3.6	26.9	27.0	9.6	14.9	1.0	0.9	0.0	8.6	9.3	0.0	3.9
Cycle Q Clear(g_c), s	3.6	26.9	27.0	9.6	14.9	1.0	4.8	0.0	8.6	17.9	0.0	3.9
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.93	1.00		0.82
Lane Grp Cap(c), veh/h	97	818	852	245	1931	861	336	0	381	250	0	388
V/C Ratio(X)	0.77	0.80	0.80	0.83	0.51	0.05	0.05	0.00	0.49	0.53	0.00	0.23
Avail Cap(c_a), veh/h	250	1121	1168	443	2629	1172	486	0	566	388	0	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.0	19.5	19.5	35.9	12.1	9.0	28.2	0.0	28.0	35.7	0.0	26.2
Incr Delay (d2), s/veh	12.2	2.9	2.8	7.1	0.2	0.0	0.1	0.0	1.0	1.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	10.9	11.3	4.5	5.4	0.3	0.3	0.0	3.3	2.8	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	22.4	22.3	43.0	12.3	9.0	28.2	0.0	29.0	37.5	0.0	26.5
LnGrp LOS	D	C	C	D	B	A	C	A	C	D	A	C
Approach Vol, veh/h		1406			1222			202			224	
Approach Delay, s/veh		23.9			17.3			28.9			33.0	
Approach LOS		C			B			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		25.1	16.4	44.3		25.1	9.2	51.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		30.5	21.5	54.5		30.5	12.1	63.9				
Max Q Clear Time (g_c+I1), s		10.6	11.6	29.0		19.9	5.6	16.9				
Green Ext Time (p_c), s		1.1	0.4	10.8		0.7	0.1	9.2				
Intersection Summary												
HCM 6th Ctrl Delay			22.3									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	1033	270	694	92	48	250	109	58	60
v/c Ratio	0.44	0.79	0.74	0.39	0.47	0.28	0.67	0.51	0.23	0.18
Control Delay	53.1	32.2	49.5	15.1	50.6	47.7	15.6	50.2	44.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.1	32.2	49.5	15.1	50.6	47.7	15.6	50.2	44.9	1.2
Queue Length 50th (ft)	44	280	157	123	55	29	0	65	34	0
Queue Length 95th (ft)	99	449	#296	212	114	68	75	130	78	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	206	1513	461	1988	349	417	547	349	417	459
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.68	0.59	0.35	0.26	0.12	0.46	0.31	0.14	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	877	74	248	504	134	85	44	230	100	53	55
Future Volume (veh/h)	67	877	74	248	504	134	85	44	230	100	53	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	73	953	80	270	548	146	92	48	250	109	58	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	94	1161	97	312	1312	348	133	339	287	150	357	302
Arrive On Green	0.05	0.35	0.35	0.18	0.48	0.48	0.07	0.18	0.18	0.08	0.19	0.19
Sat Flow, veh/h	1767	3292	276	1767	2755	731	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	73	510	523	270	350	344	92	48	250	109	58	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1806	1767	1763	1724	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.6	23.3	23.4	13.1	11.5	11.6	4.5	1.9	13.7	5.3	2.3	2.8
Cycle Q Clear(g_c), s	3.6	23.3	23.4	13.1	11.5	11.6	4.5	1.9	13.7	5.3	2.3	2.8
Prop In Lane	1.00		0.15	1.00		0.42	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	622	637	312	839	821	133	339	287	150	357	302
V/C Ratio(X)	0.77	0.82	0.82	0.86	0.42	0.42	0.69	0.14	0.87	0.73	0.16	0.20
Avail Cap(c_a), veh/h	214	786	806	477	1049	1026	361	430	364	361	430	364
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	26.1	26.1	35.4	15.2	15.2	40.0	30.4	35.2	39.5	29.8	30.0
Incr Delay (d2), s/veh	12.6	5.6	5.5	10.1	0.3	0.3	6.4	0.2	16.7	6.6	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	10.3	10.6	6.4	4.4	4.4	2.2	0.9	6.4	2.6	1.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	31.7	31.6	45.5	15.5	15.5	46.3	30.6	51.9	46.1	30.0	30.3
LnGrp LOS	D	C	C	D	B	B	D	C	D	D	C	C
Approach Vol, veh/h		1106			964			390			227	
Approach Delay, s/veh		33.1			23.9			47.9			37.9	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	20.7	20.2	35.7	11.1	21.5	9.2	46.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.1	20.5	23.9	39.5	18.1	20.5	10.7	52.7
Max Q Clear Time (g_c+I1), s	7.3	15.7	15.1	25.4	6.5	4.8	5.6	13.6
Green Ext Time (p_c), s	0.2	0.5	0.5	5.9	0.1	0.4	0.1	5.0

Intersection Summary	
HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	606	32	1548	93	736
v/c Ratio	0.77	0.09	0.80	0.54	0.31
Control Delay	46.5	12.8	21.6	61.7	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	12.8	21.6	61.7	7.0
Queue Length 50th (ft)	212	0	432	64	95
Queue Length 95th (ft)	294	29	562	127	131
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	983	434	2337	211	2823
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.07	0.66	0.44	0.26

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	554	33	1009	415	86	677
Future Volume (veh/h)	554	33	1009	415	86	677
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	602	36	1097	451	93	736
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	735	327	1398	561	120	2427
Arrive On Green	0.21	0.21	0.57	0.57	0.07	0.69
Sat Flow, veh/h	3534	1572	2548	985	1767	3618
Grp Volume(v), veh/h	602	36	780	768	93	736
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1678	1767	1763
Q Serve(g_s), s	14.1	1.6	29.7	31.6	4.5	7.1
Cycle Q Clear(g_c), s	14.1	1.6	29.7	31.6	4.5	7.1
Prop In Lane	1.00	1.00		0.59	1.00	
Lane Grp Cap(c), veh/h	735	327	1003	955	120	2427
V/C Ratio(X)	0.82	0.11	0.78	0.80	0.78	0.30
Avail Cap(c_a), veh/h	1118	497	1369	1303	234	3386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	27.9	14.5	14.9	39.9	5.3
Incr Delay (d2), s/veh	3.0	0.1	2.0	2.7	10.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	0.6	11.1	11.4	2.3	2.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.8	28.1	16.5	17.6	50.2	5.4
LnGrp LOS	D	C	B	B	D	A
Approach Vol, veh/h	638		1548			829
Approach Delay, s/veh	35.4		17.0			10.4
Approach LOS	D		B			B

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	10.4	54.0	64.4	22.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	67.5	83.5	27.5
Max Q Clear Time (g_c+I1), s	6.5	33.6	9.1	16.1
Green Ext Time (p_c), s	0.1	15.9	6.2	1.9

Intersection Summary	
HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	145	250	527	378	173
v/c Ratio	0.35	0.14	0.52	0.42	0.34
Control Delay	19.7	5.4	9.4	15.9	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	5.4	9.4	15.9	5.7
Queue Length 50th (ft)	32	13	26	39	0
Queue Length 95th (ft)	88	32	73	88	42
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1258	3505	2781	2803	1223
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.19	0.13	0.14

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	133	230	212	273	286	221
Future Volume (veh/h)	133	230	212	273	286	221
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	145	250	230	297	364	184
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	197	1924	552	492	748	333
Arrive On Green	0.11	0.55	0.31	0.31	0.21	0.21
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	145	250	230	297	364	184
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	2.9	1.3	3.8	5.9	3.4	3.9
Cycle Q Clear(g_c), s	2.9	1.3	3.8	5.9	3.4	3.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	197	1924	552	492	748	333
V/C Ratio(X)	0.74	0.13	0.42	0.60	0.49	0.55
Avail Cap(c_a), veh/h	1452	6983	1829	1631	3572	1589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	4.1	10.1	10.8	12.9	13.1
Incr Delay (d2), s/veh	5.3	0.0	0.5	1.2	0.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.2	1.2	1.7	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.2	4.2	10.6	12.0	13.3	14.5
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		395	527		548	
Approach Delay, s/veh		10.4	11.4		13.7	
Approach LOS		B	B		B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	24.8	12.4	8.6	16.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	73.5	37.5	30.5	38.5
Max Q Clear Time (g_c+I1), s	3.3	5.9	4.9	7.9
Green Ext Time (p_c), s	1.8	2.0	0.4	3.7

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	13	436	7	22	405	153	27	295
v/c Ratio	0.28	0.04	0.66	0.04	0.10	0.68	0.08	0.13	0.44
Control Delay	31.0	24.0	8.6	35.2	24.7	24.8	9.7	34.5	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	24.0	8.6	35.2	24.7	24.8	9.7	34.5	20.6
Queue Length 50th (ft)	19	3	0	2	3	92	6	7	27
Queue Length 95th (ft)	83	22	83	18	28	291	42	42	99
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	422	1084	1101	185	784	1396	3128	219	1485
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.01	0.40	0.04	0.03	0.29	0.05	0.12	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	12	401	6	11	9	373	137	4	25	173	98
Future Volume (veh/h)	70	12	401	6	11	9	373	137	4	25	173	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	13	436	7	12	10	405	149	4	27	188	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	101	582	493	16	249	207	472	1312	35	52	301	163
Arrive On Green	0.06	0.31	0.31	0.01	0.27	0.27	0.27	0.37	0.37	0.03	0.14	0.14
Sat Flow, veh/h	1767	1856	1572	1767	936	780	1767	3508	94	1767	2205	1198
Grp Volume(v), veh/h	76	13	436	7	0	22	405	75	78	27	149	146
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1715	1767	1763	1839	1767	1763	1640
Q Serve(g_s), s	2.8	0.3	17.3	0.3	0.0	0.6	14.3	1.8	1.8	1.0	5.2	5.6
Cycle Q Clear(g_c), s	2.8	0.3	17.3	0.3	0.0	0.6	14.3	1.8	1.8	1.0	5.2	5.6
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.05	1.00		0.73
Lane Grp Cap(c), veh/h	101	582	493	16	0	456	472	659	688	52	240	224
V/C Ratio(X)	0.75	0.02	0.88	0.43	0.00	0.05	0.86	0.11	0.11	0.52	0.62	0.65
Avail Cap(c_a), veh/h	336	860	729	148	0	613	1168	1594	1663	175	603	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	15.6	21.4	32.4	0.0	18.0	22.9	13.5	13.5	31.5	26.8	26.9
Incr Delay (d2), s/veh	10.8	0.0	8.8	17.3	0.0	0.0	4.6	0.1	0.1	7.7	2.6	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.1	7.0	0.2	0.0	0.2	6.0	0.7	0.7	0.5	2.2	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	15.6	30.2	49.7	0.0	18.0	27.5	13.5	13.5	39.1	29.4	30.2
LnGrp LOS	D	B	C	D	A	B	C	B	B	D	C	C
Approach Vol, veh/h		525			29			558			322	
Approach Delay, s/veh		31.5			25.7			23.7			30.6	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	29.1	5.1	25.1	22.1	13.5	8.3	22.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	59.5	5.5	30.5	43.5	22.5	12.5	23.5				
Max Q Clear Time (g_c+I1), s	3.0	3.8	2.3	19.3	16.3	7.6	4.8	2.6				
Green Ext Time (p_c), s	0.0	0.9	0.0	1.3	1.3	1.4	0.1	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			28.1									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	454	48	219	291	416	40	506
v/c Ratio	0.44	0.51	0.25	0.42	0.64	0.26	0.23	0.62
Control Delay	38.6	17.1	40.9	32.0	33.9	14.6	42.1	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.6	17.1	40.9	32.0	33.9	14.6	42.1	25.1
Queue Length 50th (ft)	51	49	20	42	116	64	17	81
Queue Length 95th (ft)	132	122	68	101	255	118	61	175
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	491	1518	252	1019	942	2664	199	1493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.30	0.19	0.21	0.31	0.16	0.20	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	201	217	44	157	44	268	317	65	37	280	186
Future Volume (veh/h)	113	201	217	44	157	44	268	317	65	37	280	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	123	218	0	48	171	0	291	345	0	40	304	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	163	549		89	402		378	1187		78	589	
Arrive On Green	0.09	0.16	0.00	0.05	0.11	0.00	0.21	0.34	0.00	0.04	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	123	218	0	48	171	0	291	345	0	40	304	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	3.0	2.4	0.0	1.2	2.0	0.0	6.8	3.1	0.0	1.0	3.4	0.0
Cycle Q Clear(g_c), s	3.0	2.4	0.0	1.2	2.0	0.0	6.8	3.1	0.0	1.0	3.4	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	163	549		89	402		378	1187		78	589	
V/C Ratio(X)	0.75	0.40		0.54	0.43		0.77	0.29		0.51	0.52	
Avail Cap(c_a), veh/h	750	2305		385	1577		1439	4569		304	2305	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.3	16.6	0.0	20.2	18.0	0.0	16.1	10.6	0.0	20.4	16.6	0.0
Incr Delay (d2), s/veh	6.9	0.5	0.0	4.9	0.7	0.0	3.3	0.1	0.0	5.2	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.9	0.0	0.5	0.7	0.0	2.6	1.0	0.0	0.5	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	17.0	0.0	25.1	18.7	0.0	19.5	10.8	0.0	25.5	17.3	0.0
LnGrp LOS	C	B		C	B		B	B		C	B	
Approach Vol, veh/h		341			219			636			344	
Approach Delay, s/veh		20.3			20.1			14.7			18.2	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	19.2	6.7	11.3	13.8	11.8	8.5	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	56.5	9.5	28.5	35.5	28.5	18.5	19.5
Max Q Clear Time (g_c+I1), s	3.0	5.1	3.2	4.4	8.8	5.4	5.0	4.0
Green Ext Time (p_c), s	0.0	2.4	0.0	1.3	0.8	1.9	0.2	0.8

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	540	223	435	211	230
v/c Ratio	0.57	0.52	0.21	0.51	0.42
Control Delay	19.4	25.6	5.7	25.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	25.6	5.7	25.8	6.3
Queue Length 50th (ft)	69	64	28	60	0
Queue Length 95th (ft)	150	157	62	151	51
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	2283	1121	3473	1153	1111
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.24	0.20	0.13	0.18	0.21

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	346	151	205	400	194	212
Future Volume (veh/h)	346	151	205	400	194	212
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	376	164	223	435	211	230
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	657	282	300	1961	386	343
Arrive On Green	0.27	0.27	0.17	0.56	0.22	0.22
Sat Flow, veh/h	2493	1032	1767	3618	1767	1572
Grp Volume(v), veh/h	275	265	223	435	211	230
Grp Sat Flow(s),veh/h/ln	1763	1670	1767	1763	1767	1572
Q Serve(g_s), s	5.4	5.5	4.8	2.5	4.2	5.3
Cycle Q Clear(g_c), s	5.4	5.5	4.8	2.5	4.2	5.3
Prop In Lane		0.62	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	482	457	300	1961	386	343
V/C Ratio(X)	0.57	0.58	0.74	0.22	0.55	0.67
Avail Cap(c_a), veh/h	1612	1527	1527	6667	1571	1398
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.5	12.5	15.7	4.5	13.9	14.3
Incr Delay (d2), s/veh	1.1	1.2	3.6	0.1	1.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.7	1.9	0.5	1.5	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.5	13.7	19.4	4.5	15.1	16.5
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	540			658	441	
Approach Delay, s/veh	13.6			9.6	15.8	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	13.2	11.3	15.4	26.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	35.5	34.5	36.5	75.5
Max Q Clear Time (g_c+I1), s	7.3	6.8	7.5	4.5
Green Ext Time (p_c), s	1.4	0.6	3.4	3.1

Intersection Summary	
HCM 6th Ctrl Delay	12.6
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	28	1034	71	648	286	121	8
v/c Ratio	0.17	0.72	0.33	0.36	0.67	0.19	0.01
Control Delay	45.9	22.0	43.6	13.4	34.8	0.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	22.1	43.6	13.4	34.8	0.7	0.0
Queue Length 50th (ft)	13	198	32	74	119	0	0
Queue Length 95th (ft)	50	371	96	198	266	0	0
Internal Link Dist (ft)		424		851		1161	269
Turn Bay Length (ft)	125		125		75		
Base Capacity (vph)	174	2331	308	2587	875	1073	1092
Starvation Cap Reductn	0	92	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.46	0.23	0.25	0.33	0.11	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	682	270	65	595	1	263	0	111	0	0	7
Future Volume (veh/h)	26	682	270	65	595	1	263	0	111	0	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	741	293	71	647	1	286	0	121	0	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	1062	420	107	1659	3	492	0	411	132	0	411
Arrive On Green	0.03	0.43	0.43	0.06	0.46	0.46	0.26	0.00	0.26	0.00	0.00	0.26
Sat Flow, veh/h	1767	2467	975	1767	3612	6	1396	0	1572	1260	0	1572
Grp Volume(v), veh/h	28	529	505	71	316	332	286	0	121	0	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1680	1767	1763	1855	1396	0	1572	1260	0	1572
Q Serve(g_s), s	0.9	13.3	13.3	2.1	6.4	6.4	10.4	0.0	3.4	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.9	13.3	13.3	2.1	6.4	6.4	10.6	0.0	3.4	0.0	0.0	0.2
Prop In Lane	1.00		0.58	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	56	759	723	107	810	852	492	0	411	132	0	411
V/C Ratio(X)	0.50	0.70	0.70	0.67	0.39	0.39	0.58	0.00	0.29	0.00	0.00	0.02
Avail Cap(c_a), veh/h	211	1632	1555	372	1793	1887	1265	0	1283	830	0	1283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	12.6	12.6	25.1	9.7	9.7	18.9	0.0	16.1	0.0	0.0	15.0
Incr Delay (d2), s/veh	6.7	1.2	1.2	6.9	0.3	0.3	1.1	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.4	4.2	1.0	2.0	2.1	3.2	0.0	1.1	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.7	13.8	13.9	32.0	10.0	10.0	20.0	0.0	16.5	0.0	0.0	15.0
LnGrp LOS	C	B	B	C	B	B	B	A	B	A	A	B
Approach Vol, veh/h		1062			719			407			8	
Approach Delay, s/veh		14.3			12.2			19.0			15.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.8	7.8	28.0		18.8	6.2	29.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		44.5	11.5	50.5		44.5	6.5	55.5				
Max Q Clear Time (g_c+I1), s		12.6	4.1	15.3		2.2	2.9	8.4				
Green Ext Time (p_c), s		1.7	0.1	8.2		0.0	0.0	4.3				

Intersection Summary			
HCM 6th Ctrl Delay			14.5
HCM 6th LOS			B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1496	1022	927	339	387	1466
v/c Ratio	1.01	0.40	1.01	0.57	0.61	0.80
Control Delay	58.8	6.4	75.8	14.1	49.3	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	42.4
Total Delay	58.8	6.4	75.8	14.1	49.3	61.0
Queue Length 50th (ft)	~594	134	~384	52	142	421
Queue Length 95th (ft)	#761	165	#526	147	195	536
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	1487	2584	920	598	637	1833
Starvation Cap Reductn	0	0	0	0	0	484
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.40	1.01	0.57	0.61	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1346	920	834	305	348	1319
Future Volume (veh/h)	1346	920	834	305	348	1319
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1496	1022	927	339	387	1466
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1500	2600	925	413	643	1730
Arrive On Green	0.44	0.74	0.26	0.26	0.19	0.19
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768
Grp Volume(v), veh/h	1496	1022	927	339	387	1466
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384
Q Serve(g_s), s	52.3	12.9	31.5	24.3	12.4	22.5
Cycle Q Clear(g_c), s	52.3	12.9	31.5	24.3	12.4	22.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	1500	2600	925	413	643	1730
V/C Ratio(X)	1.00	0.39	1.00	0.82	0.60	0.85
Avail Cap(c_a), veh/h	1500	2600	925	413	643	1730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	5.8	44.3	41.6	44.6	17.9
Incr Delay (d2), s/veh	22.6	0.1	30.0	12.5	4.1	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.5	4.1	17.3	21.1	5.6	34.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	56.3	5.9	74.2	54.1	48.8	23.3
LnGrp LOS	E	A	F	D	D	C
Approach Vol, veh/h		2518	1266		1853	
Approach Delay, s/veh		35.9	68.8		28.6	
Approach LOS		D	E		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				93.0		27.0	57.0	36.0
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				88.5		22.5	52.5	31.5
Max Q Clear Time (g_c+I1), s				14.9		24.5	54.3	33.5
Green Ext Time (p_c), s				9.4		0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	40.9
HCM 6th LOS	D

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	112	1974	1998	256	822	133
v/c Ratio	0.99	0.71	1.17	0.34	0.62	0.20
Control Delay	152.5	26.8	119.5	25.2	39.3	14.7
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	152.5	26.8	119.5	25.2	39.3	14.7
Queue Length 50th (ft)	57	508	~1222	151	331	37
Queue Length 95th (ft)	#125	563	#1354	220	402	85
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	113	2769	1705	763	1326	656
Starvation Cap Reductn	0	0	30	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.71	1.19	0.34	0.62	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	1777	1798	230	740	120
Future Volume (veh/h)	101	1777	1798	230	740	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	1974	1998	256	822	133
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	114	2786	1716	765	1337	613
Arrive On Green	0.03	0.55	0.49	0.49	0.39	0.39
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	112	1974	1998	256	822	133
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	4.9	43.1	73.0	15.0	28.9	8.5
Cycle Q Clear(g_c), s	4.9	43.1	73.0	15.0	28.9	8.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	114	2786	1716	765	1337	613
V/C Ratio(X)	0.98	0.71	1.16	0.33	0.61	0.22
Avail Cap(c_a), veh/h	114	2786	1716	765	1337	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.5	24.9	38.5	23.6	36.7	30.5
Incr Delay (d2), s/veh	79.0	0.8	80.8	0.3	2.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	17.1	49.8	5.6	12.6	9.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	151.4	25.7	119.3	23.9	38.8	31.3
LnGrp LOS	F	C	F	C	D	C
Approach Vol, veh/h		2086	2254		955	
Approach Delay, s/veh		32.5	108.5		37.8	
Approach LOS		C	F		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		87.0		63.0	9.5	77.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		45.1		30.9	6.9	75.0
Green Ext Time (p_c), s		21.7		3.9	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		65.8
HCM 6th LOS		E

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	117	330	465	39	77	501
v/c Ratio	0.27	0.52	0.42	0.07	0.21	0.29
Control Delay	16.5	6.0	13.1	5.7	17.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	6.0	13.1	5.7	17.3	5.6
Queue Length 50th (ft)	23	0	46	0	15	24
Queue Length 95th (ft)	65	51	93	16	49	51
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1678	1516	3176	1424	1238	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.22	0.15	0.03	0.06	0.14

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	108	304	428	36	71	461
Future Volume (veh/h)	108	304	428	36	71	461
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	117	330	465	39	77	501
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	492	438	873	390	226	1730
Arrive On Green	0.28	0.28	0.25	0.25	0.13	0.49
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	117	330	465	39	77	501
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	2.0	7.5	4.5	0.7	1.6	3.3
Cycle Q Clear(g_c), s	2.0	7.5	4.5	0.7	1.6	3.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	492	438	873	390	226	1730
V/C Ratio(X)	0.24	0.75	0.53	0.10	0.34	0.29
Avail Cap(c_a), veh/h	1969	1752	3476	1551	1109	6095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.9	12.9	12.7	11.3	15.5	5.9
Incr Delay (d2), s/veh	0.2	2.6	0.5	0.1	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.2	1.3	0.2	0.5	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.1	15.5	13.2	11.4	16.4	6.0
LnGrp LOS	B	B	B	B	B	A
Approach Vol, veh/h	447		504			578
Approach Delay, s/veh	14.4		13.1			7.4
Approach LOS	B		B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.5	14.2				23.7		15.4
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	24.5	38.5				67.5		43.5
Max Q Clear Time (g_c+I1), s	3.6	6.5				5.3		9.5
Green Ext Time (p_c), s	0.2	3.2				3.5		1.5

Intersection Summary		
HCM 6th Ctrl Delay		11.3
HCM 6th LOS		B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	102	234	127	135	191	90	1075	217	158	471
v/c Ratio	0.56	0.76	0.65	0.36	0.40	0.52	0.82	0.75	0.18	0.48
Control Delay	60.7	60.1	64.4	44.7	9.1	60.4	35.4	61.6	18.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	60.1	64.4	44.7	9.1	60.4	35.4	61.6	18.8	3.5
Queue Length 50th (ft)	74	162	91	89	0	65	366	155	69	0
Queue Length 95th (ft)	135	#283	#173	159	64	122	458	#267	115	58
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	236	368	232	389	481	222	1605	353	999	1064
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.64	0.55	0.35	0.40	0.41	0.67	0.61	0.16	0.44

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	179	36	117	124	176	83	810	179	200	145	433
Future Volume (veh/h)	94	179	36	117	124	176	83	810	179	200	145	433
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	102	195	39	127	135	191	90	880	195	217	158	471
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	131	238	48	161	325	276	116	1114	247	260	871	738
Arrive On Green	0.07	0.16	0.16	0.09	0.18	0.18	0.07	0.39	0.39	0.15	0.47	0.47
Sat Flow, veh/h	1767	1501	300	1767	1856	1572	1767	2869	635	1767	1856	1572
Grp Volume(v), veh/h	102	0	234	127	135	191	90	541	534	217	158	471
Grp Sat Flow(s),veh/h/ln	1767	0	1801	1767	1856	1572	1767	1763	1741	1767	1856	1572
Q Serve(g_s), s	4.7	0.0	10.5	5.9	5.4	9.5	4.2	22.6	22.7	10.0	4.1	19.0
Cycle Q Clear(g_c), s	4.7	0.0	10.5	5.9	5.4	9.5	4.2	22.6	22.7	10.0	4.1	19.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	131	0	286	161	325	276	116	685	676	260	871	738
V/C Ratio(X)	0.78	0.00	0.82	0.79	0.42	0.69	0.77	0.79	0.79	0.84	0.18	0.64
Avail Cap(c_a), veh/h	289	0	441	285	450	381	272	1000	988	433	1221	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	0.0	34.1	37.3	30.7	32.4	38.5	22.6	22.6	34.7	12.9	16.8
Incr Delay (d2), s/veh	9.4	0.0	6.9	8.4	0.8	3.1	10.4	2.7	2.7	7.0	0.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	5.0	2.9	2.5	3.8	2.1	9.3	9.2	4.7	1.7	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	0.0	41.0	45.7	31.6	35.6	48.8	25.3	25.3	41.7	13.0	17.7
LnGrp LOS	D	A	D	D	C	D	D	C	C	D	B	B
Approach Vol, veh/h		336			453			1165			846	
Approach Delay, s/veh		43.0			37.2			27.1			23.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.8	37.0	12.1	17.8	10.0	43.8	10.7	19.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	47.5	13.5	20.5	12.9	55.1	13.7	20.3
Max Q Clear Time (g_c+I1), s	12.0	24.7	7.9	12.5	6.2	21.0	6.7	11.5
Green Ext Time (p_c), s	0.4	7.9	0.1	0.8	0.1	2.8	0.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	393	1009	1087	98	1518	304
v/c Ratio	0.29	0.87	0.59	0.11	0.83	0.19
Control Delay	25.7	37.9	21.2	3.4	28.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	37.9	21.2	3.4	28.6	0.3
Queue Length 50th (ft)	105	359	295	0	502	0
Queue Length 95th (ft)	163	529	410	28	684	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1755	1486	2386	1099	2386	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.68	0.46	0.09	0.64	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	362	0	928	0	1000	90	0	1397	280
Future Volume (veh/h)	0	0	0	362	0	928	0	1000	90	0	1397	280
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				393	0	1009	0	1087	98	0	1518	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1399	0	1129	0	1805	805	0	1805	
Arrive On Green				0.41	0.00	0.41	0.00	0.51	0.51	0.00	0.51	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				393	0	1009	0	1087	98	0	1518	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				8.6	0.0	38.2	0.0	24.4	3.6	0.0	41.5	0.0
Cycle Q Clear(g_c), s				8.6	0.0	38.2	0.0	24.4	3.6	0.0	41.5	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1399	0	1129	0	1805	805	0	1805	
V/C Ratio(X)				0.28	0.00	0.89	0.00	0.60	0.12	0.00	0.84	
Avail Cap(c_a), veh/h				1724	0	1392	0	2338	1043	0	2338	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				22.2	0.0	31.0	0.0	19.3	14.3	0.0	23.5	0.0
Incr Delay (d2), s/veh				0.1	0.0	6.7	0.0	0.3	0.1	0.0	2.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.4	0.0	13.1	0.0	9.4	1.3	0.0	16.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.3	0.0	37.7	0.0	19.7	14.3	0.0	25.8	0.0
LnGrp LOS				C	A	D	A	B	B	A	C	
Approach Vol, veh/h					1402			1185			1518	
Approach Delay, s/veh					33.4			19.2			25.8	
Approach LOS					C			B			C	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	62.0	62.0	50.3
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	74.5	74.5	56.5
Max Q Clear Time (g_c+I1), s	26.4	43.5	40.2
Green Ext Time (p_c), s	10.0	14.1	5.7

Intersection Summary	
HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	803	623	112	939	419	152	29	34	120
v/c Ratio	0.57	0.56	0.40	0.43	0.61	0.58	0.33	0.17	0.18	0.23
Control Delay	37.8	22.7	0.8	40.4	26.0	33.2	19.5	42.3	42.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	22.7	0.8	40.4	26.0	33.2	19.5	42.3	42.0	8.7
Queue Length 50th (ft)	92	175	0	52	147	98	28	14	16	8
Queue Length 95th (ft)	193	298	0	124	243	180	106	47	53	50
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	651	2070	1568	421	2300	1165	690	472	578	766
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.39	0.40	0.27	0.41	0.36	0.22	0.06	0.06	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	803	623	112	893	46	419	55	97	29	34	120
Future Volume (veh/h)	200	803	623	112	893	46	419	55	97	29	34	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	200	803	0	112	893	46	419	55	0	29	34	120
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	256	1229		147	1415	73	584	350		146	187	386
Arrive On Green	0.14	0.35	0.00	0.08	0.29	0.29	0.17	0.19	0.00	0.08	0.10	0.10
Sat Flow, veh/h	1767	3526	1572	1767	4933	254	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	200	803	0	112	611	328	419	55	0	29	34	120
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1810	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	6.6	11.6	0.0	3.8	9.5	9.6	7.0	1.5	0.0	0.9	1.0	3.8
Cycle Q Clear(g_c), s	6.6	11.6	0.0	3.8	9.5	9.6	7.0	1.5	0.0	0.9	1.0	3.8
Prop In Lane	1.00		1.00	1.00		0.14	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	256	1229		147	969	519	584	350		146	187	386
V/C Ratio(X)	0.78	0.65		0.76	0.63	0.63	0.72	0.16		0.20	0.18	0.31
Avail Cap(c_a), veh/h	744	2358		482	1757	942	1331	812		540	659	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	16.6	0.0	27.2	18.8	18.8	23.7	20.5	0.0	25.9	24.9	18.7
Incr Delay (d2), s/veh	5.2	0.6	0.0	8.0	0.7	1.3	1.7	0.2	0.0	0.7	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	4.1	0.0	1.8	3.3	3.6	2.8	0.6	0.0	0.4	0.4	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.1	17.2	0.0	35.1	19.5	20.1	25.4	20.8	0.0	26.6	25.4	19.1
LnGrp LOS	C	B		D	B	C	C	C		C	C	B
Approach Vol, veh/h		1003			1051			474			183	
Approach Delay, s/veh		19.8			21.3			24.9			21.5	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	15.9	9.5	25.6	14.8	10.6	13.3	21.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	26.5	16.5	40.5	23.5	21.5	25.5	31.5
Max Q Clear Time (g_c+I1), s	2.9	3.5	5.8	13.6	9.0	5.8	8.6	11.6
Green Ext Time (p_c), s	0.0	0.2	0.2	5.7	1.3	0.4	0.5	5.8

Intersection Summary	
HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	28	609	354	23	789	324	9	2	5
v/c Ratio	0.10	0.38	0.39	0.08	0.54	0.37	0.01	0.01	0.01
Control Delay	25.8	10.2	3.1	26.0	13.4	19.0	0.0	28.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	10.2	3.1	26.0	13.4	19.0	0.0	28.0	0.0
Queue Length 50th (ft)	5	37	0	4	51	27	0	0	0
Queue Length 95th (ft)	36	158	50	32	214	109	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	375	3163	1449	375	3163	2100	1374	287	910
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.19	0.24	0.06	0.25	0.15	0.01	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	560	326	21	725	1	298	0	8	2	0	5
Future Volume (veh/h)	26	560	326	21	725	1	298	0	8	2	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	609	0	23	788	1	324	0	9	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	59	1265		50	1277	2	542	326	276	5	0	32
Arrive On Green	0.03	0.36	0.00	0.03	0.35	0.35	0.16	0.00	0.18	0.00	0.00	0.02
Sat Flow, veh/h	1767	3526	1572	1767	3613	5	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	28	609	0	23	384	405	324	0	9	2	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1855	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	0.6	5.5	0.0	0.5	7.5	7.5	3.6	0.0	0.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.6	5.5	0.0	0.5	7.5	7.5	3.6	0.0	0.2	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	1265		50	623	656	542	326	276	5	0	32
V/C Ratio(X)	0.48	0.48		0.46	0.62	0.62	0.60	0.00	0.03	0.41	0.00	0.16
Avail Cap(c_a), veh/h	363	4131		363	2065	2173	2029	1726	1463	278	0	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	10.3	0.0	19.8	11.1	11.1	16.2	0.0	14.1	20.6	0.0	19.9
Incr Delay (d2), s/veh	5.9	0.3	0.0	6.6	1.0	0.9	1.1	0.0	0.0	47.6	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.5	0.0	0.3	2.2	2.3	1.3	0.0	0.1	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	10.6	0.0	26.4	12.1	12.0	17.3	0.0	14.2	68.2	0.0	22.2
LnGrp LOS	C	B		C	B	B	B	A	B	E	A	C
Approach Vol, veh/h		637			812			333			7	
Approach Delay, s/veh		11.2			12.4			17.2			35.3	
Approach LOS		B			B			B			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	11.8	5.7	19.3	11.0	5.3	5.9	19.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	38.5	8.5	48.5	24.5	20.5	8.5	48.5
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.5	7.5	5.6	2.1	2.6	9.5
Green Ext Time (p_c), s	0.0	0.0	0.0	4.3	1.1	0.0	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	475	104	13	486	303	65
v/c Ratio	0.38	0.17	0.04	0.35	0.31	0.13
Control Delay	9.4	3.6	14.7	6.8	11.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	3.6	14.7	6.8	11.0	5.1
Queue Length 50th (ft)	22	0	2	23	15	0
Queue Length 95th (ft)	85	24	15	50	63	22
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3499	1566	1239	3505	3241	1498
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.07	0.01	0.14	0.09	0.04

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	437	96	12	447	279	60
Future Volume (veh/h)	437	96	12	447	279	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	475	104	13	486	303	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	983	439	261	1975	589	270
Arrive On Green	0.28	0.28	0.15	0.56	0.17	0.17
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	475	104	13	486	303	65
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	3.8	1.7	0.2	2.4	2.7	1.2
Cycle Q Clear(g_c), s	3.8	1.7	0.2	2.4	2.7	1.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	983	439	261	1975	589	270
V/C Ratio(X)	0.48	0.24	0.05	0.25	0.51	0.24
Avail Cap(c_a), veh/h	5090	2270	1078	7713	3827	1755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	9.4	12.3	3.8	12.6	12.0
Incr Delay (d2), s/veh	0.4	0.3	0.1	0.1	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.4	0.1	0.2	0.8	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.5	9.6	12.4	3.8	13.3	12.5
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	579			499	368	
Approach Delay, s/veh	10.3			4.1	13.2	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.3	9.5	13.9				23.3
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		37.5	20.5	48.5				73.5
Max Q Clear Time (g_c+I1), s		4.7	2.2	5.8				4.4
Green Ext Time (p_c), s		1.3	0.0	3.6				3.4

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	491	68	615	16	2	25	71	26
v/c Ratio	0.05	0.24	0.13	0.25	0.01	0.00	0.05	0.12	0.05
Control Delay	18.2	10.0	16.4	6.0	0.4	15.5	9.2	15.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	10.0	16.4	6.0	0.4	15.5	9.2	15.4	8.4
Queue Length 50th (ft)	5	46	14	29	0	0	1	14	0
Queue Length 95th (ft)	23	92	45	108	2	5	16	45	15
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	1035	3478	1223	3505	1568	1557	1354	1557	1336
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.14	0.06	0.18	0.01	0.00	0.02	0.05	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	447	5	63	566	15	2	3	20	65	1	23
Future Volume (veh/h)	22	447	5	63	566	15	2	3	20	65	1	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	486	5	68	615	16	2	3	22	71	1	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1203	12	129	1338	597	387	21	155	388	7	168
Arrive On Green	0.03	0.34	0.34	0.07	0.38	0.38	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3575	37	1767	3526	1572	1374	192	1410	1375	61	1521
Grp Volume(v), veh/h	24	240	251	68	615	16	2	0	25	71	0	26
Grp Sat Flow(s),veh/h/ln	1767	1763	1849	1767	1763	1572	1374	0	1602	1375	0	1582
Q Serve(g_s), s	0.4	2.9	2.9	1.0	3.7	0.2	0.0	0.0	0.4	1.4	0.0	0.4
Cycle Q Clear(g_c), s	0.4	2.9	2.9	1.0	3.7	0.2	0.5	0.0	0.4	1.8	0.0	0.4
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	54	593	622	129	1338	597	387	0	177	388	0	174
V/C Ratio(X)	0.45	0.40	0.40	0.53	0.46	0.03	0.01	0.00	0.14	0.18	0.00	0.15
Avail Cap(c_a), veh/h	911	3165	3319	1413	7332	3270	1871	0	1908	1874	0	1884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.4	7.2	7.2	12.6	6.6	5.5	11.5	0.0	11.3	12.1	0.0	11.3
Incr Delay (d2), s/veh	5.7	0.4	0.4	3.3	0.2	0.0	0.0	0.0	0.4	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.7	0.7	0.4	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	7.6	7.6	15.8	6.8	5.5	11.5	0.0	11.7	12.3	0.0	11.7
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		515			699			27			97	
Approach Delay, s/veh		8.1			7.7			11.7			12.2	
Approach LOS		A			A			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.6	6.6	14.0		7.6	5.4	15.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		33.5	22.5	50.5		33.5	14.5	58.5				
Max Q Clear Time (g_c+I1), s		2.5	3.0	4.9		3.8	2.4	5.7				
Green Ext Time (p_c), s		0.1	0.1	3.3		0.3	0.0	5.0				
Intersection Summary												
HCM 6th Ctrl Delay			8.2									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	328	214	410	28	23	105	58	14	20
v/c Ratio	0.17	0.40	0.46	0.23	0.11	0.09	0.31	0.20	0.04	0.05
Control Delay	26.1	20.7	22.7	12.2	26.8	27.0	6.5	25.8	23.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	20.7	22.7	12.2	26.8	27.0	6.5	25.8	23.6	0.2
Queue Length 50th (ft)	14	48	62	48	9	7	0	17	3	0
Queue Length 95th (ft)	46	100	137	94	33	29	28	54	20	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	505	1874	1192	2779	789	1065	962	829	1092	984
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.18	0.18	0.15	0.04	0.02	0.11	0.07	0.01	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	267	35	197	279	98	26	21	97	53	13	18
Future Volume (veh/h)	42	267	35	197	279	98	26	21	97	53	13	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	290	38	214	303	107	28	23	105	58	14	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	88	552	72	288	743	257	196	245	208	160	207	176
Arrive On Green	0.05	0.18	0.18	0.16	0.29	0.29	0.11	0.13	0.13	0.09	0.11	0.11
Sat Flow, veh/h	1767	3138	407	1767	2569	889	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	46	162	166	214	206	204	28	23	105	58	14	20
Grp Sat Flow(s),veh/h/ln	1767	1763	1782	1767	1763	1695	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	1.0	3.4	3.5	4.7	3.9	4.0	0.6	0.4	2.6	1.3	0.3	0.5
Cycle Q Clear(g_c), s	1.0	3.4	3.5	4.7	3.9	4.0	0.6	0.4	2.6	1.3	0.3	0.5
Prop In Lane	1.00		0.23	1.00		0.52	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	88	310	313	288	510	491	196	245	208	160	207	176
V/C Ratio(X)	0.52	0.52	0.53	0.74	0.40	0.42	0.14	0.09	0.51	0.36	0.07	0.11
Avail Cap(c_a), veh/h	538	1008	1019	1398	1866	1795	839	1151	976	882	1197	1014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	15.4	15.4	16.4	11.7	11.8	16.5	15.7	16.6	17.6	16.3	16.4
Incr Delay (d2), s/veh	4.8	1.4	1.4	3.8	0.5	0.6	0.3	0.2	1.9	1.4	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.3	1.3	1.9	1.3	1.3	0.2	0.2	0.9	0.5	0.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	16.7	16.8	20.1	12.3	12.4	16.8	15.8	18.5	18.9	16.5	16.7
LnGrp LOS	C	B	B	C	B	B	B	B	B	B	B	B
Approach Vol, veh/h		374			624			156			92	
Approach Delay, s/veh		17.6			15.0			17.8			18.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	9.9	11.2	11.7	9.1	9.1	6.5	16.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	32.5	23.5	19.5	26.5	12.5	43.5
Max Q Clear Time (g_c+I1), s	3.3	4.6	6.7	5.5	2.6	2.5	3.0	6.0
Green Ext Time (p_c), s	0.1	0.4	0.6	1.7	0.0	0.1	0.0	2.7

Intersection Summary	
HCM 6th Ctrl Delay	16.4
HCM 6th LOS	B

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	140	19	700	55	309
v/c Ratio	0.16	0.05	0.38	0.13	0.14
Control Delay	15.9	9.9	7.9	17.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	9.9	7.9	17.2	3.9
Queue Length 50th (ft)	9	0	27	7	13
Queue Length 95th (ft)	39	15	108	40	25
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2533	1066	3333	1042	3505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.02	0.21	0.05	0.09

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	127	19	432	212	51	284
Future Volume (veh/h)	127	19	432	212	51	284
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	138	21	470	230	55	309
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	422	188	898	436	107	2095
Arrive On Green	0.12	0.12	0.39	0.39	0.06	0.59
Sat Flow, veh/h	3534	1572	2392	1118	1767	3618
Grp Volume(v), veh/h	138	21	360	340	55	309
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1654	1767	1763
Q Serve(g_s), s	1.1	0.4	4.9	5.0	0.9	1.2
Cycle Q Clear(g_c), s	1.1	0.4	4.9	5.0	0.9	1.2
Prop In Lane	1.00	1.00		0.68	1.00	
Lane Grp Cap(c), veh/h	422	188	688	646	107	2095
V/C Ratio(X)	0.33	0.11	0.52	0.53	0.51	0.15
Avail Cap(c_a), veh/h	2868	1276	3506	3290	1040	9592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	12.3	7.3	7.4	14.3	2.8
Incr Delay (d2), s/veh	0.4	0.3	0.6	0.7	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	1.2	1.2	0.4	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.1	12.6	8.0	8.0	18.1	2.9
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	159		700			364
Approach Delay, s/veh	13.1		8.0			5.2
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.4	16.8				23.2		8.3
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	18.5	62.5				85.5		25.5
Max Q Clear Time (g_c+I1), s	2.9	7.0				3.2		3.1
Green Ext Time (p_c), s	0.1	5.3				2.3		0.5

Intersection Summary			
HCM 6th Ctrl Delay			7.8
HCM 6th LOS			A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	150	104	313	124	56
v/c Ratio	0.29	0.05	0.34	0.15	0.15
Control Delay	13.7	3.7	6.6	12.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	3.7	6.6	12.6	6.5
Queue Length 50th (ft)	24	3	9	9	0
Queue Length 95th (ft)	64	10	35	27	21
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1726	3505	3014	2947	1257
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.03	0.10	0.04	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	138	96	100	188	98	67
Future Volume (veh/h)	138	96	100	188	98	67
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	104	109	204	119	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	219	1893	439	392	479	213
Arrive On Green	0.12	0.54	0.25	0.25	0.14	0.14
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	150	104	109	204	119	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	2.2	0.4	1.4	3.1	0.8	0.9
Cycle Q Clear(g_c), s	2.2	0.4	1.4	3.1	0.8	0.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	219	1893	439	392	479	213
V/C Ratio(X)	0.68	0.05	0.25	0.52	0.25	0.28
Avail Cap(c_a), veh/h	2540	10201	2278	2032	4052	1803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	3.0	8.3	8.9	10.6	10.7
Incr Delay (d2), s/veh	3.7	0.0	0.3	1.1	0.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.4	0.8	0.2	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.3	3.0	8.6	10.0	10.9	11.4
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h		254	313		179	
Approach Delay, s/veh		10.3	9.5		11.1	
Approach LOS		B	A		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				19.3		8.2	7.9	11.3
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				79.5		31.5	39.5	35.5
Max Q Clear Time (g_c+I1), s				2.4		2.9	4.2	5.1
Green Ext Time (p_c), s				0.7		0.6	0.4	2.1

Intersection Summary			
HCM 6th Ctrl Delay			10.1
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	8	140	4	33	238	280	10	369
v/c Ratio	0.11	0.02	0.34	0.02	0.13	0.48	0.12	0.04	0.42
Control Delay	25.6	21.7	8.0	27.0	16.0	20.8	7.3	26.4	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	21.7	8.0	27.0	16.0	20.8	7.3	26.4	18.9
Queue Length 50th (ft)	7	2	0	1	2	48	9	2	38
Queue Length 95th (ft)	35	14	45	10	27	149	62	17	108
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	398	1118	1005	314	930	1396	3404	314	2410
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	0.14	0.01	0.04	0.17	0.08	0.03	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	7	129	4	7	23	219	253	5	9	290	50
Future Volume (veh/h)	28	7	129	4	7	23	219	253	5	9	290	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	30	8	140	4	8	25	238	275	5	10	315	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	63	264	224	10	44	139	321	1311	24	23	608	103
Arrive On Green	0.04	0.14	0.14	0.01	0.11	0.11	0.18	0.37	0.37	0.01	0.20	0.20
Sat Flow, veh/h	1767	1856	1572	1767	396	1237	1767	3542	64	1767	3015	511
Grp Volume(v), veh/h	30	8	140	4	0	33	238	137	143	10	183	186
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1633	1767	1763	1844	1767	1763	1764
Q Serve(g_s), s	0.6	0.1	3.2	0.1	0.0	0.7	4.9	2.0	2.0	0.2	3.5	3.6
Cycle Q Clear(g_c), s	0.6	0.1	3.2	0.1	0.0	0.7	4.9	2.0	2.0	0.2	3.5	3.6
Prop In Lane	1.00		1.00	1.00		0.76	1.00		0.03	1.00		0.29
Lane Grp Cap(c), veh/h	63	264	224	10	0	183	321	652	683	23	355	355
V/C Ratio(X)	0.48	0.03	0.63	0.42	0.00	0.18	0.74	0.21	0.21	0.43	0.51	0.52
Avail Cap(c_a), veh/h	437	1233	1045	345	0	1000	1726	2824	2954	345	1446	1447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	14.2	15.5	19.0	0.0	15.4	14.9	8.3	8.3	18.8	13.7	13.7
Incr Delay (d2), s/veh	5.5	0.0	2.9	26.2	0.0	0.5	3.4	0.2	0.2	12.0	1.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	1.1	0.1	0.0	0.2	1.8	0.6	0.6	0.2	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	14.2	18.4	45.3	0.0	15.9	18.2	8.4	8.4	30.8	14.8	14.9
LnGrp LOS	C	B	B	D	A	B	B	A	A	C	B	B
Approach Vol, veh/h		178			37			518			379	
Approach Delay, s/veh		19.1			19.1			12.9			15.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.0	18.7	4.7	10.0	11.5	12.2	5.9	8.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	61.5	7.5	25.5	37.5	31.5	9.5	23.5
Max Q Clear Time (g_c+I1), s	2.2	4.0	2.1	5.2	6.9	5.6	2.6	2.7
Green Ext Time (p_c), s	0.0	1.7	0.0	0.4	0.7	2.1	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	165	870	141	326	527	356	196	355
v/c Ratio	0.68	0.90	0.78	0.42	0.90	0.33	0.71	0.69
Control Delay	60.1	45.8	78.2	39.0	55.0	29.0	59.2	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	45.8	78.2	39.0	55.0	29.0	59.2	42.4
Queue Length 50th (ft)	117	274	103	104	355	97	139	102
Queue Length 95th (ft)	192	#421	#223	165	#584	146	218	153
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	327	1014	187	779	660	1223	375	699
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.86	0.75	0.42	0.80	0.29	0.52	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	446	354	130	257	43	485	279	49	180	207	120
Future Volume (veh/h)	152	446	354	130	257	43	485	279	49	180	207	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	165	485	0	141	279	0	527	303	0	196	225	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	210	702		179	640		592	1062		246	371	
Arrive On Green	0.12	0.20	0.00	0.10	0.18	0.00	0.34	0.30	0.00	0.14	0.11	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	165	485	0	141	279	0	527	303	0	196	225	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	6.3	8.9	0.0	5.4	4.9	0.0	19.6	4.6	0.0	7.5	4.2	0.0
Cycle Q Clear(g_c), s	6.3	8.9	0.0	5.4	4.9	0.0	19.6	4.6	0.0	7.5	4.2	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	210	702		179	640		592	1062		246	371	
V/C Ratio(X)	0.78	0.69		0.79	0.44		0.89	0.29		0.80	0.61	
Avail Cap(c_a), veh/h	512	1499		293	1062		1031	1930		586	1041	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.7	25.8	0.0	30.5	25.3	0.0	21.9	18.5	0.0	28.9	29.7	0.0
Incr Delay (d2), s/veh	6.3	1.2	0.0	7.5	0.5	0.0	5.2	0.1	0.0	5.8	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.6	0.0	2.5	2.0	0.0	8.1	1.7	0.0	3.4	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.0	27.0	0.0	37.9	25.7	0.0	27.1	18.7	0.0	34.8	31.3	0.0
LnGrp LOS	D	C		D	C		C	B		C	C	
Approach Vol, veh/h		650			420			830			421	
Approach Delay, s/veh		29.3			29.8			24.0			32.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	25.4	11.5	18.3	27.8	11.8	12.8	17.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.0	38.0	11.5	29.5	40.5	20.5	20.1	20.9
Max Q Clear Time (g_c+I1), s	9.5	6.6	7.4	10.9	21.6	6.2	8.3	6.9
Green Ext Time (p_c), s	0.4	2.0	0.1	3.0	1.6	1.1	0.3	1.4

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	743	439	493	338	537
v/c Ratio	0.77	0.81	0.22	0.73	0.66
Control Delay	36.7	44.0	8.0	44.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	44.0	8.0	44.1	7.4
Queue Length 50th (ft)	198	246	60	190	0
Queue Length 95th (ft)	335	426	104	338	91
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1236	805	2848	686	940
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.55	0.17	0.49	0.57

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	455	228	404	454	311	494
Future Volume (veh/h)	455	228	404	454	311	494
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	495	248	439	493	338	537
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	584	291	481	2019	599	533
Arrive On Green	0.26	0.26	0.27	0.57	0.34	0.34
Sat Flow, veh/h	2371	1136	1767	3618	1767	1572
Grp Volume(v), veh/h	383	360	439	493	338	537
Grp Sat Flow(s),veh/h/ln	1763	1651	1767	1763	1767	1572
Q Serve(g_s), s	21.0	21.1	24.5	7.1	15.9	34.5
Cycle Q Clear(g_c), s	21.0	21.1	24.5	7.1	15.9	34.5
Prop In Lane		0.69	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	452	423	481	2019	599	533
V/C Ratio(X)	0.85	0.85	0.91	0.24	0.56	1.01
Avail Cap(c_a), veh/h	546	511	703	2650	599	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	36.0	35.9	10.8	27.5	33.6
Incr Delay (d2), s/veh	10.2	11.3	12.3	0.1	1.2	40.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	9.6	11.8	2.6	6.8	18.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.1	47.3	48.2	10.9	28.7	74.4
LnGrp LOS	D	D	D	B	C	F
Approach Vol, veh/h	743			932	875	
Approach Delay, s/veh	46.7			28.4	56.8	
Approach LOS	D			C	E	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	39.0	32.2	30.6	62.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	34.5	40.5	31.5	76.5
Max Q Clear Time (g_c+I1), s	36.5	26.5	23.1	9.1
Green Ext Time (p_c), s	0.0	1.2	2.9	3.6

Intersection Summary	
HCM 6th Ctrl Delay	43.5
HCM 6th LOS	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	25	798	96	759	148	97
v/c Ratio	0.11	0.59	0.32	0.42	0.46	0.15
Control Delay	29.1	16.2	27.5	10.4	26.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	16.2	27.5	10.4	26.8	0.5
Queue Length 50th (ft)	7	104	28	53	42	0
Queue Length 95th (ft)	34	204	84	171	114	0
Internal Link Dist (ft)		424		851		1161
Turn Bay Length (ft)	125		125		75	
Base Capacity (vph)	337	3022	691	3334	947	1177
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.14	0.23	0.16	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	617	117	88	697	1	136	0	89	0	0	0
Future Volume (veh/h)	23	617	117	88	697	1	136	0	89	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	671	127	96	758	1	148	0	97	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1161	220	151	1617	2	460	0	232	200	273	0
Arrive On Green	0.03	0.39	0.39	0.09	0.45	0.45	0.15	0.00	0.15	0.00	0.00	0.00
Sat Flow, veh/h	1767	2958	559	1767	3613	5	1767	0	1572	1288	1856	0
Grp Volume(v), veh/h	25	400	398	96	370	389	148	0	97	0	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1755	1767	1763	1855	1767	0	1572	1288	1856	0
Q Serve(g_s), s	0.5	6.4	6.4	1.9	5.3	5.3	2.8	0.0	2.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	6.4	6.4	1.9	5.3	5.3	2.8	0.0	2.0	0.0	0.0	0.0
Prop In Lane	1.00		0.32	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	54	692	689	151	789	830	460	0	232	200	273	0
V/C Ratio(X)	0.46	0.58	0.58	0.63	0.47	0.47	0.32	0.00	0.42	0.00	0.00	0.00
Avail Cap(c_a), veh/h	466	2518	2507	956	3007	3164	1940	0	1548	1278	1827	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	17.2	8.6	8.6	15.9	7.0	7.0	14.3	0.0	14.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.0	0.8	0.8	4.3	0.4	0.4	0.4	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.7	1.7	0.8	1.2	1.3	1.0	0.0	0.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	9.4	9.4	20.3	7.4	7.4	14.7	0.0	15.2	0.0	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	B	A	A	A
Approach Vol, veh/h		823			855			245			0	
Approach Delay, s/veh		9.8			8.8			14.9			0.0	
Approach LOS		A			A			B				
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.8	7.6	18.7		9.8	5.6	20.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		35.5	19.5	51.5		35.5	9.5	61.5				
Max Q Clear Time (g_c+I1), s		4.8	3.9	8.4		0.0	2.5	7.3				
Green Ext Time (p_c), s		1.0	0.2	5.7		0.0	0.0	5.3				
Intersection Summary												
HCM 6th Ctrl Delay			10.0									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	464	480	646	241	99	1120
v/c Ratio	0.58	0.26	0.75	0.43	0.07	0.59
Control Delay	42.8	15.5	45.6	6.6	22.4	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.3
Total Delay	42.8	15.5	45.6	6.6	22.4	13.5
Queue Length 50th (ft)	156	98	230	0	22	209
Queue Length 95th (ft)	224	130	295	60	43	323
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	796	2028	1068	645	1367	1896
Starvation Cap Reductn	0	0	0	0	0	611
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.24	0.60	0.37	0.07	0.87

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	418	432	581	217	89	1008		
Future Volume (veh/h)	418	432	581	217	89	1008		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	464	480	646	241	99	1120		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	819	1794	809	361	1406	1796		
Arrive On Green	0.24	0.51	0.23	0.23	0.41	0.41		
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768		
Grp Volume(v), veh/h	464	480	646	241	99	1120		
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384		
Q Serve(g_s), s	13.2	8.6	19.2	15.5	1.9	26.5		
Cycle Q Clear(g_c), s	13.2	8.6	19.2	15.5	1.9	26.5		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	819	1794	809	361	1406	1796		
V/C Ratio(X)	0.57	0.27	0.80	0.67	0.07	0.62		
Avail Cap(c_a), veh/h	819	2081	1096	489	1406	1796		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	37.2	15.5	40.3	38.9	19.9	11.5		
Incr Delay (d2), s/veh	2.8	0.1	3.0	2.1	0.1	1.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	3.4	8.5	13.4	0.8	23.7		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	40.0	15.6	43.4	41.0	20.0	13.1		
LnGrp LOS	D	B	D	D	B	B		
Approach Vol, veh/h		944	887		1219			
Approach Delay, s/veh		27.6	42.7		13.7			
Approach LOS		C	D		B			
Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				61.0		50.0	31.0	30.0
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5		45.5	26.5	34.5
Max Q Clear Time (g_c+I1), s				10.6		28.5	15.2	21.2
Green Ext Time (p_c), s				3.5		5.4	1.3	4.3
Intersection Summary								
HCM 6th Ctrl Delay			26.4					
HCM 6th LOS			C					

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	96	668	1142	219	151	187
v/c Ratio	0.73	0.28	0.81	0.35	0.10	0.24
Control Delay	92.9	20.5	39.3	28.0	22.3	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.9	20.5	39.3	28.0	22.3	10.8
Queue Length 50th (ft)	41	120	440	126	36	34
Queue Length 95th (ft)	#101	146	521	188	70	100
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	132	3232	1990	890	1547	775
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.21	0.57	0.25	0.10	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	601	1028	197	136	168
Future Volume (veh/h)	86	601	1028	197	136	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	96	668	1142	219	151	187
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	135	2376	1390	620	1578	724
Arrive On Green	0.04	0.47	0.39	0.39	0.46	0.46
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	96	668	1142	219	151	187
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	3.5	10.3	36.9	12.5	3.2	9.3
Cycle Q Clear(g_c), s	3.5	10.3	36.9	12.5	3.2	9.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	135	2376	1390	620	1578	724
V/C Ratio(X)	0.71	0.28	0.82	0.35	0.10	0.26
Avail Cap(c_a), veh/h	135	3287	2024	903	1578	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.4	20.6	34.5	27.1	19.4	21.0
Incr Delay (d2), s/veh	27.3	0.1	1.8	0.3	0.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.0	15.8	4.7	1.3	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	87.6	20.7	36.3	27.4	19.5	21.9
LnGrp LOS	F	C	D	C	B	C
Approach Vol, veh/h		764	1361		338	
Approach Delay, s/veh		29.1	34.9		20.8	
Approach LOS		C	C		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		64.1		63.0	9.5	54.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		12.3		11.3	5.5	38.9
Green Ext Time (p_c), s		5.2		1.2	0.0	11.2

Intersection Summary			
HCM 6th Ctrl Delay			31.2
HCM 6th LOS			C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	96	429	98	224	288
v/c Ratio	0.14	0.28	0.43	0.19	0.45	0.11
Control Delay	20.0	8.2	15.1	5.0	17.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	8.2	15.1	5.0	17.7	3.0
Queue Length 50th (ft)	9	0	45	0	45	11
Queue Length 95th (ft)	34	33	93	27	113	22
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1131	1046	3116	1405	1601	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.09	0.14	0.07	0.14	0.08

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	88	395	90	206	265
Future Volume (veh/h)	37	88	395	90	206	265
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	96	429	98	224	288
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	195	173	934	417	349	2133
Arrive On Green	0.11	0.11	0.26	0.26	0.20	0.61
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	40	96	429	98	224	288
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	0.7	1.8	3.2	1.5	3.7	1.1
Cycle Q Clear(g_c), s	0.7	1.8	3.2	1.5	3.7	1.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	195	173	934	417	349	2133
V/C Ratio(X)	0.21	0.55	0.46	0.24	0.64	0.14
Avail Cap(c_a), veh/h	1426	1269	4406	1965	2320	9536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.8	13.3	9.7	9.1	11.7	2.7
Incr Delay (d2), s/veh	0.5	2.7	0.4	0.3	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.6	0.8	0.4	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.3	16.1	10.1	9.4	13.6	2.7
LnGrp LOS	B	B	B	A	B	A
Approach Vol, veh/h	136		527			512
Approach Delay, s/veh	15.3		9.9			7.5
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.7	12.9				23.6		8.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	41.5	39.5				85.5		25.5
Max Q Clear Time (g_c+I1), s	5.7	5.2				3.1		3.8
Green Ext Time (p_c), s	0.6	3.2				1.9		0.3

Intersection Summary			
HCM 6th Ctrl Delay			9.5
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	70	108	170	168	113	43	378	103	140	617
v/c Ratio	0.26	0.34	0.44	0.39	0.24	0.18	0.45	0.33	0.24	0.67
Control Delay	31.0	28.8	29.0	26.3	5.0	32.0	23.7	30.2	20.8	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	28.8	29.0	26.3	5.0	32.0	23.7	30.2	20.8	6.4
Queue Length 50th (ft)	24	34	57	54	0	15	62	35	42	0
Queue Length 95th (ft)	73	95	139	130	29	52	128	95	101	81
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	406	709	795	1057	956	300	2560	547	1531	1406
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.15	0.21	0.16	0.12	0.14	0.15	0.19	0.09	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	81	18	156	155	104	40	301	47	95	129	568
Future Volume (veh/h)	64	81	18	156	155	104	40	301	47	95	129	568
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	88	20	170	168	113	43	327	51	103	140	617
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	141	32	220	305	259	75	1261	195	135	827	701
Arrive On Green	0.06	0.10	0.10	0.12	0.16	0.16	0.04	0.41	0.41	0.08	0.45	0.45
Sat Flow, veh/h	1767	1463	333	1767	1856	1572	1767	3061	473	1767	1856	1572
Grp Volume(v), veh/h	70	0	108	170	168	113	43	187	191	103	140	617
Grp Sat Flow(s),veh/h/ln	1767	0	1796	1767	1856	1572	1767	1763	1770	1767	1856	1572
Q Serve(g_s), s	2.4	0.0	3.6	5.8	5.1	4.0	1.5	4.3	4.4	3.5	2.8	22.1
Cycle Q Clear(g_c), s	2.4	0.0	3.6	5.8	5.1	4.0	1.5	4.3	4.4	3.5	2.8	22.1
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	100	0	173	220	305	259	75	726	729	135	827	701
V/C Ratio(X)	0.70	0.00	0.62	0.77	0.55	0.44	0.58	0.26	0.26	0.76	0.17	0.88
Avail Cap(c_a), veh/h	328	0	566	643	915	775	243	1268	1273	443	1544	1309
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	26.9	26.2	23.8	23.3	29.1	12.0	12.0	28.0	10.3	15.6
Incr Delay (d2), s/veh	8.6	0.0	3.6	5.7	1.6	1.2	6.8	0.2	0.2	8.6	0.1	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.6	2.6	2.3	1.5	0.7	1.5	1.6	1.7	1.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	30.5	31.9	25.3	24.4	35.9	12.2	12.2	36.7	10.4	19.4
LnGrp LOS	D	A	C	C	C	C	D	B	B	D	B	B
Approach Vol, veh/h		178			451			421			860	
Approach Delay, s/veh		33.2			27.6			14.6			20.0	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	30.0	12.2	10.5	7.1	32.1	8.0	14.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	44.5	22.5	19.5	8.5	51.5	11.5	30.5
Max Q Clear Time (g_c+I1), s	5.5	6.4	7.8	5.6	3.5	24.1	4.4	7.1
Green Ext Time (p_c), s	0.2	2.4	0.4	0.4	0.0	3.5	0.1	1.3

Intersection Summary		
HCM 6th Ctrl Delay		21.8
HCM 6th LOS		C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	482	1021	636	40	1714	235
v/c Ratio	0.45	0.85	0.31	0.04	0.83	0.15
Control Delay	32.0	26.3	12.0	3.5	22.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	26.3	12.0	3.5	22.7	0.2
Queue Length 50th (ft)	136	212	108	0	468	0
Queue Length 95th (ft)	225	380	179	16	725	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1617	1564	2744	1236	2744	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.65	0.23	0.03	0.62	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	443	0	939	0	585	37	0	1577	216
Future Volume (veh/h)	0	0	0	443	0	939	0	585	37	0	1577	216
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				482	0	1021	0	636	40	0	1714	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1275	0	1029	0	1966	877	0	1966	
Arrive On Green				0.37	0.00	0.37	0.00	0.56	0.56	0.00	0.56	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				482	0	1021	0	636	40	0	1714	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				13.1	0.0	46.9	0.0	12.4	1.5	0.0	53.5	0.0
Cycle Q Clear(g_c), s				13.1	0.0	46.9	0.0	12.4	1.5	0.0	53.5	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1275	0	1029	0	1966	877	0	1966	
V/C Ratio(X)				0.38	0.00	0.99	0.00	0.32	0.05	0.00	0.87	
Avail Cap(c_a), veh/h				1275	0	1029	0	2305	1028	0	2305	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				29.3	0.0	39.9	0.0	15.2	12.8	0.0	24.3	0.0
Incr Delay (d2), s/veh				0.2	0.0	26.0	0.0	0.1	0.0	0.0	3.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.3	0.0	19.0	0.0	4.8	0.5	0.0	21.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.5	0.0	65.9	0.0	15.3	12.8	0.0	27.8	0.0
LnGrp LOS				C	A	E	A	B	B	A	C	
Approach Vol, veh/h					1503			676			1714	
Approach Delay, s/veh					54.2			15.2			27.8	
Approach LOS					D			B			C	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		75.7				75.7		52.0				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		83.5				83.5		47.5				
Max Q Clear Time (g_c+I1), s		14.4				55.5		48.9				
Green Ext Time (p_c), s		4.8				15.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		35.8
HCM 6th LOS		D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	301	745	1093	173	869	1321	347	56	67	229
v/c Ratio	0.94	0.86	0.70	0.84	0.95	0.96	0.46	0.39	0.42	0.44
Control Delay	82.8	51.2	2.6	80.5	64.5	49.6	15.3	56.1	56.0	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.8	51.2	2.6	80.5	64.5	49.6	15.3	56.1	56.0	20.1
Queue Length 50th (ft)	213	267	0	122	223	469	94	38	46	72
Queue Length 95th (ft)	#403	#391	0	#256	#331	#660	184	80	91	142
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	320	865	1568	206	913	1373	768	292	328	520
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.86	0.70	0.84	0.95	0.96	0.45	0.19	0.20	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	301	745	1093	173	801	68	1321	82	265	56	67	229
Future Volume (veh/h)	301	745	1093	173	801	68	1321	82	265	56	67	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	301	745	0	173	801	68	1321	82	0	56	67	229
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	298	802		192	797	67	1275	856		86	257	482
Arrive On Green	0.17	0.23	0.00	0.11	0.17	0.17	0.37	0.46	0.00	0.05	0.14	0.14
Sat Flow, veh/h	1767	3526	1572	1767	4758	402	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	301	745	0	173	567	302	1321	82	0	56	67	229
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1783	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	19.7	24.2	0.0	11.3	19.6	19.6	43.5	2.9	0.0	3.6	3.8	13.8
Cycle Q Clear(g_c), s	19.7	24.2	0.0	11.3	19.6	19.6	43.5	2.9	0.0	3.6	3.8	13.8
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	298	802		192	566	299	1275	856		86	257	482
V/C Ratio(X)	1.01	0.93		0.90	1.00	1.01	1.04	0.10		0.65	0.26	0.47
Avail Cap(c_a), veh/h	298	802		192	566	299	1275	856		272	305	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.6	44.3	0.0	51.5	48.7	48.7	36.7	17.8	0.0	54.7	45.1	32.9
Incr Delay (d2), s/veh	55.1	17.1	0.0	38.8	38.6	54.5	35.1	0.0	0.0	7.9	0.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	12.2	0.0	7.0	11.1	13.0	24.0	1.3	0.0	1.8	1.8	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	103.8	61.4	0.0	90.3	87.3	103.2	71.8	17.8	0.0	62.6	45.6	33.6
LnGrp LOS	F	E		F	F	F	F	B		E	D	C
Approach Vol, veh/h		1046			1042			1403			352	
Approach Delay, s/veh		73.6			92.4			68.7			40.5	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	58.5	17.2	31.1	48.0	20.7	24.2	24.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	44.7	12.7	26.6	43.5	19.2	19.7	19.6
Max Q Clear Time (g_c+I1), s	5.6	4.9	13.3	26.2	45.5	15.8	21.7	21.6
Green Ext Time (p_c), s	0.1	0.4	0.0	0.2	0.0	0.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	73.9
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	70	897	299	39	874	209	34	2	5
v/c Ratio	0.23	0.51	0.32	0.15	0.57	0.31	0.06	0.01	0.01
Control Delay	27.2	11.4	2.8	28.5	14.2	23.9	0.2	31.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	11.4	2.8	28.5	14.2	23.9	0.2	31.0	0.0
Queue Length 50th (ft)	19	53	0	11	104	28	0	1	0
Queue Length 95th (ft)	73	236	42	48	243	85	0	8	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	534	3227	1467	376	3146	1267	1156	257	842
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.28	0.20	0.10	0.28	0.16	0.03	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	825	275	36	804	0	192	0	31	2	0	5
Future Volume (veh/h)	64	825	275	36	804	0	192	0	31	2	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	897	0	39	874	0	209	0	34	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	114	1463		75	1386	0	360	272	231	5	0	70
Arrive On Green	0.06	0.41	0.00	0.04	0.39	0.00	0.11	0.00	0.15	0.00	0.00	0.04
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	70	897	0	39	874	0	209	0	34	2	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.8	9.1	0.0	1.0	9.2	0.0	2.7	0.0	0.9	0.1	0.0	0.1
Cycle Q Clear(g_c), s	1.8	9.1	0.0	1.0	9.2	0.0	2.7	0.0	0.9	0.1	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	114	1463		75	1386	0	360	272	231	5	0	70
V/C Ratio(X)	0.62	0.61		0.52	0.63	0.00	0.58	0.00	0.15	0.41	0.00	0.07
Avail Cap(c_a), veh/h	521	4271		366	3963	0	1235	1235	1047	251	0	704
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.9	10.5	0.0	21.5	11.2	0.0	19.5	0.0	17.0	22.8	0.0	21.0
Incr Delay (d2), s/veh	5.3	0.4	0.0	5.4	0.5	0.0	1.5	0.0	0.3	47.7	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.6	0.0	0.5	2.6	0.0	1.0	0.0	0.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	10.9	0.0	26.8	11.7	0.0	21.0	0.0	17.3	70.5	0.0	21.4
LnGrp LOS	C	B		C	B	A	C	A	B	E	A	C
Approach Vol, veh/h		967			913			243			7	
Approach Delay, s/veh		12.0			12.3			20.5			35.5	
Approach LOS		B			B			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	11.2	6.5	23.5	9.3	6.5	7.4	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	9.5	55.5	16.5	20.5	13.5	51.5
Max Q Clear Time (g_c+I1), s	2.1	2.9	3.0	11.1	4.7	2.1	3.8	11.2
Green Ext Time (p_c), s	0.0	0.1	0.0	7.2	0.5	0.0	0.1	6.8

Intersection Summary			
HCM 6th Ctrl Delay			13.2
HCM 6th LOS			B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	627	271	50	704	154	27
v/c Ratio	0.33	0.28	0.12	0.31	0.18	0.06
Control Delay	8.9	2.7	17.7	4.6	16.0	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	2.7	17.7	4.6	16.0	9.2
Queue Length 50th (ft)	30	0	7	34	10	0
Queue Length 95th (ft)	111	35	39	61	43	17
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3488	1562	1243	3505	2696	1249
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.17	0.04	0.20	0.06	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	577	249	46	648	142	25
Future Volume (veh/h)	577	249	46	648	142	25
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	627	271	50	704	154	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1256	560	251	2208	404	185
Arrive On Green	0.36	0.36	0.14	0.63	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	627	271	50	704	154	27
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	4.9	4.7	0.9	3.3	1.5	0.5
Cycle Q Clear(g_c), s	4.9	4.7	0.9	3.3	1.5	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1256	560	251	2208	404	185
V/C Ratio(X)	0.50	0.48	0.20	0.32	0.38	0.15
Avail Cap(c_a), veh/h	5361	2391	1231	8267	2777	1274
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	8.8	13.3	3.1	14.3	13.9
Incr Delay (d2), s/veh	0.3	0.6	0.4	0.1	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.1	0.3	0.2	0.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.5	13.7	3.2	14.9	14.3
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	898			754	181	
Approach Delay, s/veh	9.3			3.9	14.8	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.6	9.5	17.0				26.5
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		28.5	24.5	53.5				82.5
Max Q Clear Time (g_c+I1), s		3.5	2.9	6.9				5.3
Green Ext Time (p_c), s		0.6	0.1	5.6				5.3

Intersection Summary	
HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1420	203	1052	40	17	185	133	91
v/c Ratio	0.44	0.83	0.70	0.51	0.04	0.07	0.41	0.75	0.24
Control Delay	56.2	27.7	55.4	14.6	2.2	35.9	10.0	66.0	13.6
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	28.0	55.4	14.6	2.2	35.9	10.0	66.0	13.6
Queue Length 50th (ft)	49	398	131	208	0	10	7	86	9
Queue Length 95th (ft)	106	608	233	332	11	30	66	164	52
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	226	2107	383	2424	1101	405	618	283	560
Starvation Cap Reductn	0	169	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.73	0.53	0.43	0.04	0.04	0.30	0.47	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	1270	37	187	968	37	16	12	158	122	15	69
Future Volume (veh/h)	69	1270	37	187	968	37	16	12	158	122	15	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	1380	40	203	1052	40	17	13	172	133	16	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	97	1683	49	241	1984	885	326	26	350	240	67	316
Arrive On Green	0.05	0.48	0.48	0.14	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1767	3499	101	1767	3526	1572	1295	112	1478	1189	284	1332
Grp Volume(v), veh/h	75	695	725	203	1052	40	17	0	185	133	0	91
Grp Sat Flow(s),veh/h/ln	1767	1763	1837	1767	1763	1572	1295	0	1590	1189	0	1616
Q Serve(g_s), s	3.9	31.3	31.4	10.4	17.3	1.1	1.0	0.0	9.3	10.1	0.0	4.2
Cycle Q Clear(g_c), s	3.9	31.3	31.4	10.4	17.3	1.1	5.2	0.0	9.3	19.4	0.0	4.2
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.93	1.00		0.82
Lane Grp Cap(c), veh/h	97	848	884	241	1984	885	326	0	377	240	0	383
V/C Ratio(X)	0.77	0.82	0.82	0.84	0.53	0.05	0.05	0.00	0.49	0.55	0.00	0.24
Avail Cap(c_a), veh/h	230	1073	1118	390	2465	1099	430	0	505	336	0	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.3	20.6	20.7	39.1	12.7	9.1	30.7	0.0	30.6	39.0	0.0	28.6
Incr Delay (d2), s/veh	12.2	4.1	4.0	8.7	0.2	0.0	0.1	0.0	1.0	2.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	13.0	13.6	5.0	6.3	0.3	0.3	0.0	3.6	3.0	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.5	24.7	24.7	47.8	12.9	9.1	30.8	0.0	31.6	41.0	0.0	28.9
LnGrp LOS	E	C	C	D	B	A	C	A	C	D	A	C
Approach Vol, veh/h		1495			1295			202			224	
Approach Delay, s/veh		26.2			18.2			31.5			36.1	
Approach LOS		C			B			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		26.5	17.2	49.1		26.5	9.6	56.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		29.5	20.5	56.5		29.5	12.1	64.9				
Max Q Clear Time (g_c+I1), s		11.3	12.4	33.4		21.4	5.9	19.3				
Green Ext Time (p_c), s		1.1	0.3	11.2		0.6	0.1	10.2				
Intersection Summary												
HCM 6th Ctrl Delay			24.0									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	1104	284	751	92	48	268	109	58	60
v/c Ratio	0.45	0.82	0.77	0.41	0.48	0.28	0.69	0.52	0.24	0.19
Control Delay	55.1	33.8	53.1	15.5	52.3	48.4	15.7	52.2	45.7	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	33.8	53.1	15.5	52.3	48.4	15.7	52.2	45.7	1.3
Queue Length 50th (ft)	45	318	170	137	57	30	0	67	36	0
Queue Length 95th (ft)	101	#535	#336	242	116	69	77	133	78	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	197	1485	434	1928	334	387	540	334	387	436
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.74	0.65	0.39	0.28	0.12	0.50	0.33	0.15	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	942	74	261	557	134	85	44	247	100	53	55
Future Volume (veh/h)	67	942	74	261	557	134	85	44	247	100	53	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	73	1024	80	284	605	146	92	48	268	109	58	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	94	1196	93	321	1380	332	129	351	298	146	369	313
Arrive On Green	0.05	0.36	0.36	0.18	0.49	0.49	0.07	0.19	0.19	0.08	0.20	0.20
Sat Flow, veh/h	1767	3313	259	1767	2818	679	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	73	545	559	284	378	373	92	48	268	109	58	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1809	1767	1763	1733	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	4.0	27.8	27.8	15.2	13.5	13.6	5.0	2.1	16.2	5.9	2.5	3.1
Cycle Q Clear(g_c), s	4.0	27.8	27.8	15.2	13.5	13.6	5.0	2.1	16.2	5.9	2.5	3.1
Prop In Lane	1.00		0.14	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	637	653	321	863	849	129	351	298	146	369	313
V/C Ratio(X)	0.78	0.86	0.86	0.88	0.44	0.44	0.71	0.14	0.90	0.75	0.16	0.19
Avail Cap(c_a), veh/h	194	734	753	427	966	950	329	380	322	329	380	322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	28.7	28.7	38.8	16.1	16.1	44.1	32.8	38.5	43.6	32.2	32.4
Incr Delay (d2), s/veh	12.7	8.8	8.6	15.6	0.4	0.4	7.1	0.2	25.6	7.4	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	12.9	13.2	7.9	5.3	5.3	2.4	1.0	8.3	2.8	1.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.1	37.5	37.3	54.4	16.5	16.5	51.2	33.0	64.1	51.0	32.4	32.7
LnGrp LOS	E	D	D	D	B	B	D	C	E	D	C	C
Approach Vol, veh/h		1177			1035			408			227	
Approach Delay, s/veh		38.7			26.9			57.5			41.4	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	22.9	22.2	39.6	11.6	23.9	9.7	52.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.1	19.9	23.5	40.5	18.1	19.9	10.7	53.3
Max Q Clear Time (g_c+I1), s	7.9	18.2	17.2	29.8	7.0	5.1	6.0	15.6
Green Ext Time (p_c), s	0.2	0.2	0.5	5.3	0.1	0.3	0.0	5.5

Intersection Summary		
HCM 6th Ctrl Delay		37.3
HCM 6th LOS		D

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	616	32	1631	93	793
v/c Ratio	0.79	0.09	0.83	0.58	0.33
Control Delay	48.7	12.8	22.6	66.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	12.8	22.6	66.5	7.2
Queue Length 50th (ft)	231	0	486	70	110
Queue Length 95th (ft)	301	29	610	#138	143
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	937	415	2306	184	2751
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.08	0.71	0.51	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	563	33	1074	427	86	730
Future Volume (veh/h)	563	33	1074	427	86	730
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	612	36	1167	464	93	793
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	731	325	1449	559	119	2459
Arrive On Green	0.21	0.21	0.58	0.58	0.07	0.70
Sat Flow, veh/h	3534	1572	2580	959	1767	3618
Grp Volume(v), veh/h	612	36	817	814	93	793
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1683	1767	1763
Q Serve(g_s), s	15.7	1.8	34.0	36.9	4.9	8.3
Cycle Q Clear(g_c), s	15.7	1.8	34.0	36.9	4.9	8.3
Prop In Lane	1.00	1.00		0.57	1.00	
Lane Grp Cap(c), veh/h	731	325	1027	981	119	2459
V/C Ratio(X)	0.84	0.11	0.80	0.83	0.78	0.32
Avail Cap(c_a), veh/h	1031	459	1281	1223	197	3124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	30.3	15.3	15.9	43.3	5.6
Incr Delay (d2), s/veh	4.3	0.1	2.8	4.1	10.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.7	13.1	13.8	2.5	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.2	30.5	18.1	20.0	53.9	5.6
LnGrp LOS	D	C	B	B	D	A
Approach Vol, veh/h	648		1631			886
Approach Delay, s/veh	39.6		19.1			10.7
Approach LOS	D		B			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	10.8	59.4				70.2	24.0
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	10.5	68.5				83.5	27.5
Max Q Clear Time (g_c+I1), s	6.9	38.9				10.3	17.7
Green Ext Time (p_c), s	0.1	16.0				6.9	1.8

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	158	250	532	388	177
v/c Ratio	0.37	0.14	0.53	0.43	0.35
Control Delay	20.0	5.4	9.6	16.2	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	5.4	9.6	16.2	5.7
Queue Length 50th (ft)	35	13	27	41	0
Queue Length 95th (ft)	96	32	75	92	43
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1272	3505	2749	2711	1189
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.19	0.14	0.15

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	145	230	212	278	290	230
Future Volume (veh/h)	145	230	212	278	290	230
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	158	250	230	302	373	188
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	215	1947	552	492	751	334
Arrive On Green	0.12	0.55	0.31	0.31	0.21	0.21
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	158	250	230	302	373	188
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	3.3	1.3	3.9	6.2	3.6	4.1
Cycle Q Clear(g_c), s	3.3	1.3	3.9	6.2	3.6	4.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	215	1947	552	492	751	334
V/C Ratio(X)	0.73	0.13	0.42	0.61	0.50	0.56
Avail Cap(c_a), veh/h	1455	6867	1774	1583	3373	1501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	4.1	10.4	11.2	13.3	13.5
Incr Delay (d2), s/veh	4.8	0.0	0.5	1.2	0.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.3	1.2	1.8	1.2	3.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.0	4.2	10.9	12.4	13.8	15.0
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		408	532		561	
Approach Delay, s/veh		10.7	11.8		14.2	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				25.6		12.6	9.2	16.5
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				74.5		36.5	31.5	38.5
Max Q Clear Time (g_c+I1), s				3.3		6.1	5.3	8.2
Green Ext Time (p_c), s				1.8		2.1	0.4	3.7

Intersection Summary			
HCM 6th Ctrl Delay			12.4
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	13	440	7	22	411	167	27	307
v/c Ratio	0.29	0.04	0.67	0.04	0.10	0.68	0.09	0.14	0.46
Control Delay	31.9	24.7	8.8	36.0	25.1	25.1	9.5	35.3	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	24.7	8.8	36.0	25.1	25.1	9.5	35.3	21.9
Queue Length 50th (ft)	19	3	0	2	3	95	6	7	31
Queue Length 95th (ft)	86	22	84	18	29	299	45	43	108
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	415	1067	1092	182	771	1431	3107	216	1396
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.01	0.40	0.04	0.03	0.29	0.05	0.13	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	12	405	6	11	9	378	150	4	25	184	98
Future Volume (veh/h)	70	12	405	6	11	9	378	150	4	25	184	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	13	440	7	12	10	411	163	4	27	200	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	585	496	16	251	209	477	1332	33	52	312	160
Arrive On Green	0.06	0.32	0.32	0.01	0.27	0.27	0.27	0.38	0.38	0.03	0.14	0.14
Sat Flow, veh/h	1767	1856	1572	1767	936	780	1767	3517	86	1767	2254	1156
Grp Volume(v), veh/h	76	13	440	7	0	22	411	81	86	27	155	152
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1715	1767	1763	1840	1767	1763	1647
Q Serve(g_s), s	2.9	0.3	17.9	0.3	0.0	0.6	14.9	2.0	2.0	1.0	5.6	5.9
Cycle Q Clear(g_c), s	2.9	0.3	17.9	0.3	0.0	0.6	14.9	2.0	2.0	1.0	5.6	5.9
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.05	1.00		0.70
Lane Grp Cap(c), veh/h	100	585	496	16	0	460	477	668	697	52	244	228
V/C Ratio(X)	0.76	0.02	0.89	0.43	0.00	0.05	0.86	0.12	0.12	0.52	0.63	0.67
Avail Cap(c_a), veh/h	328	841	713	144	0	599	1168	1558	1627	171	563	526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	15.9	21.9	33.2	0.0	18.3	23.4	13.6	13.6	32.2	27.4	27.5
Incr Delay (d2), s/veh	11.4	0.0	9.7	17.4	0.0	0.0	4.7	0.1	0.1	7.8	2.7	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.1	7.4	0.2	0.0	0.2	6.3	0.7	0.8	0.5	2.4	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	15.9	31.6	50.6	0.0	18.3	28.1	13.7	13.7	40.0	30.1	30.9
LnGrp LOS	D	B	C	D	A	B	C	B	B	D	C	C
Approach Vol, veh/h		529			29			578			334	
Approach Delay, s/veh		32.8			26.1			23.9			31.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	30.0	5.1	25.7	22.7	13.8	8.3	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	59.5	5.5	30.5	44.5	21.5	12.5	23.5
Max Q Clear Time (g_c+I1), s	3.0	4.0	2.3	19.9	16.9	7.9	4.9	2.6
Green Ext Time (p_c), s	0.0	1.0	0.0	1.3	1.3	1.4	0.1	0.1

Intersection Summary	
HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	454	48	219	291	422	40	523
v/c Ratio	0.49	0.45	0.27	0.45	0.67	0.28	0.25	0.66
Control Delay	40.0	16.4	42.5	33.4	36.2	15.1	43.8	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	16.4	42.5	33.4	36.2	15.1	43.8	25.9
Queue Length 50th (ft)	58	51	21	44	121	67	17	84
Queue Length 95th (ft)	145	123	70	103	262	122	62	182
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	471	1402	230	884	834	2622	181	1422
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.32	0.21	0.25	0.35	0.16	0.22	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	201	217	44	157	44	268	323	65	37	285	196
Future Volume (veh/h)	125	201	217	44	157	44	268	323	65	37	285	196
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	136	218	0	48	171	0	291	351	0	40	310	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	181	578		89	394		376	1189		77	593	
Arrive On Green	0.10	0.16	0.00	0.05	0.11	0.00	0.21	0.34	0.00	0.04	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	136	218	0	48	171	0	291	351	0	40	310	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	3.3	2.5	0.0	1.2	2.0	0.0	6.9	3.3	0.0	1.0	3.6	0.0
Cycle Q Clear(g_c), s	3.3	2.5	0.0	1.2	2.0	0.0	6.9	3.3	0.0	1.0	3.6	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	181	578		89	394		376	1189		77	593	
V/C Ratio(X)	0.75	0.38		0.54	0.43		0.77	0.30		0.52	0.52	
Avail Cap(c_a), veh/h	774	2258		377	1466		1370	4476		298	2337	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.4	16.6	0.0	20.6	18.4	0.0	16.5	10.8	0.0	20.8	16.9	0.0
Incr Delay (d2), s/veh	6.2	0.4	0.0	5.0	0.8	0.0	3.4	0.1	0.0	5.2	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.9	0.0	0.5	0.7	0.0	2.7	1.0	0.0	0.5	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	17.0	0.0	25.6	19.2	0.0	19.9	11.0	0.0	26.0	17.6	0.0
LnGrp LOS	C	B		C	B		B	B		C	B	
Approach Vol, veh/h		354			219			642			350	
Approach Delay, s/veh		20.3			20.6			15.0			18.6	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	19.5	6.7	11.8	14.0	12.0	9.1	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	56.5	9.5	28.5	34.5	29.5	19.5	18.5
Max Q Clear Time (g_c+I1), s	3.0	5.3	3.2	4.5	8.9	5.6	5.3	4.0
Green Ext Time (p_c), s	0.0	2.5	0.0	1.3	0.8	1.9	0.3	0.8

Intersection Summary			
HCM 6th Ctrl Delay			17.8
HCM 6th LOS			B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	540	234	435	211	243
v/c Ratio	0.57	0.54	0.21	0.51	0.44
Control Delay	19.8	25.8	5.7	26.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	25.8	5.7	26.1	6.4
Queue Length 50th (ft)	71	68	29	61	0
Queue Length 95th (ft)	153	166	63	153	53
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	2195	1139	3463	1139	1104
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.25	0.21	0.13	0.19	0.22

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	346	151	215	400	194	224
Future Volume (veh/h)	346	151	215	400	194	224
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	376	164	234	435	211	243
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	647	278	313	1961	398	354
Arrive On Green	0.27	0.27	0.18	0.56	0.23	0.23
Sat Flow, veh/h	2493	1032	1767	3618	1767	1572
Grp Volume(v), veh/h	275	265	234	435	211	243
Grp Sat Flow(s),veh/h/ln	1763	1670	1767	1763	1767	1572
Q Serve(g_s), s	5.5	5.7	5.2	2.6	4.3	5.8
Cycle Q Clear(g_c), s	5.5	5.7	5.2	2.6	4.3	5.8
Prop In Lane		0.62	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	475	450	313	1961	398	354
V/C Ratio(X)	0.58	0.59	0.75	0.22	0.53	0.69
Avail Cap(c_a), veh/h	1521	1441	1525	6469	1525	1357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	13.1	16.1	4.6	14.0	14.6
Incr Delay (d2), s/veh	1.1	1.2	3.6	0.1	1.1	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.8	2.0	0.5	1.6	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	14.3	19.6	4.7	15.1	17.0
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	540			669	454	
Approach Delay, s/veh	14.2			9.9	16.1	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.8	11.8	15.6				27.4
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		35.5	35.5	35.5				75.5
Max Q Clear Time (g_c+I1), s		7.8	7.2	7.7				4.6
Green Ext Time (p_c), s		1.5	0.7	3.4				3.1

Intersection Summary			
HCM 6th Ctrl Delay			13.0
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	28	1051	71	648	305	121	8
v/c Ratio	0.18	0.73	0.34	0.37	0.69	0.19	0.01
Control Delay	47.6	23.2	45.3	14.1	35.6	0.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	23.2	45.3	14.1	35.6	0.6	0.0
Queue Length 50th (ft)	13	212	33	79	133	0	0
Queue Length 95th (ft)	51	391	98	205	286	0	0
Internal Link Dist (ft)		424		851		1161	269
Turn Bay Length (ft)	125		125		75		
Base Capacity (vph)	168	2245	298	2490	868	1065	1084
Starvation Cap Reductn	0	90	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.49	0.24	0.26	0.35	0.11	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	682	285	65	595	1	281	0	111	0	0	7
Future Volume (veh/h)	26	682	285	65	595	1	281	0	111	0	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	741	310	71	647	1	305	0	121	0	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	1044	437	105	1657	3	502	0	429	126	0	429
Arrive On Green	0.03	0.43	0.43	0.06	0.46	0.46	0.27	0.00	0.27	0.00	0.00	0.27
Sat Flow, veh/h	1767	2423	1013	1767	3612	6	1396	0	1572	1260	0	1572
Grp Volume(v), veh/h	28	539	512	71	316	332	305	0	121	0	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1673	1767	1763	1855	1396	0	1572	1260	0	1572
Q Serve(g_s), s	0.9	14.3	14.3	2.2	6.7	6.7	11.6	0.0	3.5	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.9	14.3	14.3	2.2	6.7	6.7	11.9	0.0	3.5	0.0	0.0	0.2
Prop In Lane	1.00		0.61	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	56	760	721	105	809	851	502	0	429	126	0	429
V/C Ratio(X)	0.50	0.71	0.71	0.68	0.39	0.39	0.61	0.00	0.28	0.00	0.00	0.02
Avail Cap(c_a), veh/h	202	1531	1453	357	1685	1773	1236	0	1255	788	0	1255
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	27.2	13.3	13.3	26.3	10.2	10.2	19.5	0.0	16.3	0.0	0.0	15.1
Incr Delay (d2), s/veh	6.9	1.2	1.3	7.5	0.3	0.3	1.2	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.8	4.6	1.1	2.2	2.3	3.6	0.0	1.2	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	14.5	14.6	33.7	10.5	10.5	20.7	0.0	16.7	0.0	0.0	15.2
LnGrp LOS	C	B	B	C	B	B	C	A	B	A	A	B
Approach Vol, veh/h		1079			719			426			8	
Approach Delay, s/veh		15.1			12.8			19.5			15.2	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.1	7.9	29.1		20.1	6.3	30.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		45.5	11.5	49.5		45.5	6.5	54.5				
Max Q Clear Time (g_c+I1), s		13.9	4.2	16.3		2.2	2.9	8.7				
Green Ext Time (p_c), s		1.7	0.1	8.3		0.0	0.0	4.3				
Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1541	1022	927	359	403	1519
v/c Ratio	1.41	0.52	1.32	0.70	0.32	0.76
Control Delay	224.5	17.7	193.5	22.1	28.2	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	22.2
Total Delay	224.5	17.7	193.5	22.1	28.2	35.5
Queue Length 50th (ft)	~827	247	~488	77	114	360
Queue Length 95th (ft)	#964	305	#619	191	156	459
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	1090	1956	701	512	1246	2001
Starvation Cap Reductn	0	0	0	0	0	533
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.41	0.52	1.32	0.70	0.32	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1387	920	834	323	363	1367
Future Volume (veh/h)	1387	920	834	323	363	1367
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1541	1022	927	359	403	1519
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1100	1968	705	314	1257	1903
Arrive On Green	0.32	0.56	0.20	0.20	0.37	0.37
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768
Grp Volume(v), veh/h	1541	1022	927	359	403	1519
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384
Q Serve(g_s), s	38.5	21.6	24.0	24.0	10.1	44.0
Cycle Q Clear(g_c), s	38.5	21.6	24.0	24.0	10.1	44.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	1100	1968	705	314	1257	1903
V/C Ratio(X)	1.40	0.52	1.31	1.14	0.32	0.80
Avail Cap(c_a), veh/h	1100	1968	705	314	1257	1903
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.7	16.5	48.0	48.0	27.3	13.0
Incr Delay (d2), s/veh	186.0	0.2	151.6	94.7	0.7	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	44.2	8.4	25.2	27.1	4.3	34.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	226.8	16.7	199.6	142.7	27.9	16.6
LnGrp LOS	F	B	F	F	C	B
Approach Vol, veh/h		2563	1286		1922	
Approach Delay, s/veh		143.0	183.7		19.0	
Approach LOS		F	F		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				71.5		48.5	43.0	28.5
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				67.0		44.0	38.5	24.0
Max Q Clear Time (g_c+I1), s				23.6		46.0	40.5	26.0
Green Ext Time (p_c), s				9.0		0.0	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		110.8
HCM 6th LOS		F

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	112	2007	2024	267	836	133
v/c Ratio	0.99	0.72	1.19	0.35	0.63	0.20
Control Delay	152.5	27.2	125.7	25.5	39.6	14.7
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	152.5	27.2	125.8	25.5	39.6	14.7
Queue Length 50th (ft)	57	522	~1250	159	339	37
Queue Length 95th (ft)	#125	578	#1382	230	410	85
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	113	2769	1705	763	1326	656
Starvation Cap Reductn	0	0	29	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.72	1.21	0.35	0.63	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	1806	1822	240	752	120
Future Volume (veh/h)	101	1806	1822	240	752	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	2007	2024	267	836	133
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	114	2786	1716	765	1337	613
Arrive On Green	0.03	0.55	0.49	0.49	0.39	0.39
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	112	2007	2024	267	836	133
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	4.9	44.3	73.0	15.7	29.5	8.5
Cycle Q Clear(g_c), s	4.9	44.3	73.0	15.7	29.5	8.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	114	2786	1716	765	1337	613
V/C Ratio(X)	0.98	0.72	1.18	0.35	0.63	0.22
Avail Cap(c_a), veh/h	114	2786	1716	765	1337	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.5	25.2	38.5	23.8	36.9	30.5
Incr Delay (d2), s/veh	79.0	0.9	87.2	0.3	2.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	17.6	51.3	5.9	12.9	9.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	151.4	26.1	125.7	24.1	39.1	31.3
LnGrp LOS	F	C	F	C	D	C
Approach Vol, veh/h		2119	2291		969	
Approach Delay, s/veh		32.7	113.9		38.1	
Approach LOS		C	F		D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		87.0		63.0	9.5	77.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		46.3		31.5	6.9	75.0
Green Ext Time (p_c), s		21.8		4.0	0.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			68.2			
HCM 6th LOS			E			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	117	350	504	39	93	533
v/c Ratio	0.30	0.56	0.47	0.08	0.26	0.28
Control Delay	18.6	6.7	14.5	5.7	19.1	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	6.7	14.5	5.7	19.1	5.2
Queue Length 50th (ft)	25	0	52	0	20	27
Queue Length 95th (ft)	70	55	104	16	60	55
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1645	1494	3074	1380	1105	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.23	0.16	0.03	0.08	0.15

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	108	322	464	36	86	490
Future Volume (veh/h)	108	322	464	36	86	490
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	117	350	504	39	93	533
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	511	455	911	406	216	1729
Arrive On Green	0.29	0.29	0.26	0.26	0.12	0.49
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	117	350	504	39	93	533
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	2.1	8.3	5.1	0.8	2.0	3.7
Cycle Q Clear(g_c), s	2.1	8.3	5.1	0.8	2.0	3.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	511	455	911	406	216	1729
V/C Ratio(X)	0.23	0.77	0.55	0.10	0.43	0.31
Avail Cap(c_a), veh/h	1880	1673	3320	1481	1059	5821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	13.3	13.1	11.5	16.6	6.2
Incr Delay (d2), s/veh	0.2	2.8	0.5	0.1	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.5	1.6	0.2	0.7	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.3	16.1	13.6	11.6	18.0	6.3
LnGrp LOS	B	B	B	B	B	A
Approach Vol, veh/h	467		543			626
Approach Delay, s/veh	14.9		13.5			8.1
Approach LOS	B		B			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	9.5	15.1	24.6	16.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	24.5	38.5	67.5	43.5
Max Q Clear Time (g_c+I1), s	4.0	7.1	5.7	10.3
Green Ext Time (p_c), s	0.2	3.5	3.8	1.6

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	102	234	127	135	191	90	1108	198	152	516
v/c Ratio	0.55	0.76	0.64	0.36	0.40	0.52	0.83	0.72	0.17	0.51
Control Delay	60.6	59.9	64.4	44.7	9.1	60.5	35.6	60.2	18.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	59.9	64.4	44.7	9.1	60.5	35.6	60.2	18.8	3.6
Queue Length 50th (ft)	74	162	92	89	0	65	375	142	66	0
Queue Length 95th (ft)	135	#283	#173	159	64	122	479	228	111	59
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	236	368	232	389	481	222	1608	353	1000	1086
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.64	0.55	0.35	0.40	0.41	0.69	0.56	0.15	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	179	36	117	124	176	83	840	179	182	140	475
Future Volume (veh/h)	94	179	36	117	124	176	83	840	179	182	140	475
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	102	195	39	127	135	191	90	913	195	198	152	516
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	131	238	48	161	325	276	116	1153	246	240	870	737
Arrive On Green	0.07	0.16	0.16	0.09	0.18	0.18	0.07	0.40	0.40	0.14	0.47	0.47
Sat Flow, veh/h	1767	1501	300	1767	1856	1572	1767	2890	617	1767	1856	1572
Grp Volume(v), veh/h	102	0	234	127	135	191	90	557	551	198	152	516
Grp Sat Flow(s),veh/h/ln	1767	0	1801	1767	1856	1572	1767	1763	1744	1767	1856	1572
Q Serve(g_s), s	4.7	0.0	10.5	5.9	5.4	9.5	4.2	23.2	23.2	9.1	4.0	21.7
Cycle Q Clear(g_c), s	4.7	0.0	10.5	5.9	5.4	9.5	4.2	23.2	23.2	9.1	4.0	21.7
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	131	0	286	161	325	276	116	703	696	240	870	737
V/C Ratio(X)	0.78	0.00	0.82	0.79	0.41	0.69	0.77	0.79	0.79	0.82	0.17	0.70
Avail Cap(c_a), veh/h	290	0	442	286	451	382	273	1003	993	434	1225	1038
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	0.0	33.9	37.2	30.6	32.3	38.4	22.0	22.1	35.1	12.8	17.5
Incr Delay (d2), s/veh	9.4	0.0	6.8	8.4	0.8	3.1	10.3	2.9	2.9	7.0	0.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	5.0	2.9	2.4	3.8	2.1	9.5	9.5	4.3	1.6	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.4	0.0	40.8	45.6	31.5	35.4	48.7	24.9	25.0	42.1	12.9	18.7
LnGrp LOS	D	A	D	D	C	D	D	C	C	D	B	B
Approach Vol, veh/h		336			453			1198			866	
Approach Delay, s/veh		42.8			37.1			26.7			23.1	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.8	37.8	12.1	17.8	10.0	43.6	10.7	19.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	20.5	47.5	13.5	20.5	12.9	55.1	13.7	20.3				
Max Q Clear Time (g_c+I1), s	11.1	25.2	7.9	12.5	6.2	23.7	6.7	11.5				
Green Ext Time (p_c), s	0.4	8.1	0.1	0.8	0.1	3.0	0.1	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			29.1									
HCM 6th LOS			C									

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	404	1035	1087	98	1551	304
v/c Ratio	0.30	0.88	0.59	0.11	0.85	0.19
Control Delay	26.3	40.0	21.7	3.3	30.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	40.0	21.7	3.3	30.3	0.3
Queue Length 50th (ft)	114	398	314	0	556	0
Queue Length 95th (ft)	168	551	410	28	712	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1678	1426	2281	1054	2281	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.73	0.48	0.09	0.68	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	372	0	952	0	1000	90	0	1427	280
Future Volume (veh/h)	0	0	0	372	0	952	0	1000	90	0	1427	280
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				404	0	1035	0	1087	98	0	1551	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1411	0	1139	0	1808	806	0	1808	
Arrive On Green				0.41	0.00	0.41	0.00	0.51	0.51	0.00	0.51	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				404	0	1035	0	1087	98	0	1551	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				9.4	0.0	41.9	0.0	25.9	3.9	0.0	45.6	0.0
Cycle Q Clear(g_c), s				9.4	0.0	41.9	0.0	25.9	3.9	0.0	45.6	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1411	0	1139	0	1808	806	0	1808	
V/C Ratio(X)				0.29	0.00	0.91	0.00	0.60	0.12	0.00	0.86	
Avail Cap(c_a), veh/h				1625	0	1312	0	2204	983	0	2204	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				23.4	0.0	32.9	0.0	20.4	15.1	0.0	25.3	0.0
Incr Delay (d2), s/veh				0.1	0.0	8.7	0.0	0.3	0.1	0.0	3.1	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.7	0.0	14.7	0.0	10.1	1.4	0.0	18.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.5	0.0	41.6	0.0	20.8	15.2	0.0	28.3	0.0
LnGrp LOS				C	A	D	A	C	B	A	C	
Approach Vol, veh/h					1439			1185			1551	
Approach Delay, s/veh					36.5			20.3			28.3	
Approach LOS					D			C			C	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		65.6				65.6		53.6
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		74.5				74.5		56.5
Max Q Clear Time (g_c+I1), s		27.9				47.6		43.9
Green Ext Time (p_c), s		10.0				13.5		5.2

Intersection Summary	
HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	327	810	1188	188	945	1436	377	61	73	249
v/c Ratio	0.82	0.98	0.76	1.01	0.84	1.00	0.48	0.41	0.45	0.58
Control Delay	64.4	68.2	3.5	118.3	48.1	56.4	15.4	56.3	56.2	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	68.2	3.5	118.3	48.1	56.4	15.4	56.3	56.2	27.7
Queue Length 50th (ft)	118	303	0	~143	234	~558	105	42	50	93
Queue Length 95th (ft)	#198	#461	0	#299	#320	#731	201	85	97	176
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	407	830	1568	186	1128	1436	802	292	333	431
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.98	0.76	1.01	0.84	1.00	0.47	0.21	0.22	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	301	745	1093	173	801	68	1321	82	265	56	67	229
Future Volume (veh/h)	301	745	1093	173	801	68	1321	82	265	56	67	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	327	810	0	188	871	74	1436	89	0	61	73	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	371	755		171	962	81	1309	903		91	290	416
Arrive On Green	0.11	0.21	0.00	0.10	0.20	0.20	0.38	0.49	0.00	0.05	0.16	0.16
Sat Flow, veh/h	3428	3526	1572	1767	4757	403	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	327	810	0	188	617	328	1436	89	0	61	73	249
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1767	1689	1783	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	11.2	25.5	0.0	11.5	21.3	21.4	45.5	3.1	0.0	4.0	4.1	16.5
Cycle Q Clear(g_c), s	11.2	25.5	0.0	11.5	21.3	21.4	45.5	3.1	0.0	4.0	4.1	16.5
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	371	755		171	683	361	1309	903		91	290	416
V/C Ratio(X)	0.88	1.07		1.10	0.90	0.91	1.10	0.10		0.67	0.25	0.60
Avail Cap(c_a), veh/h	371	755		171	683	361	1309	903		267	304	428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.4	46.8	0.0	53.8	46.4	46.4	36.8	16.5	0.0	55.5	44.1	38.3
Incr Delay (d2), s/veh	20.9	54.2	0.0	98.8	15.5	25.9	55.7	0.0	0.0	8.3	0.5	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	16.6	0.0	9.7	10.2	11.9	28.7	1.3	0.0	2.0	1.9	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.3	101.0	0.0	152.6	61.8	72.4	92.5	16.5	0.0	63.8	44.6	40.5
LnGrp LOS	E	F		F	E	E	F	B		E	D	D
Approach Vol, veh/h		1137			1133			1525			383	
Approach Delay, s/veh		93.1			80.0			88.0			45.0	
Approach LOS		F			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	62.5	16.0	30.0	50.0	23.1	17.4	28.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	47.0	11.5	25.5	45.5	19.5	12.9	24.1
Max Q Clear Time (g_c+I1), s	6.0	5.1	13.5	27.5	47.5	18.5	13.2	23.4
Green Ext Time (p_c), s	0.1	0.5	0.0	0.0	0.0	0.1	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	83.3
HCM 6th LOS	F

Notes
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	327	810	1188	188	945	1436	377	61	73	249
v/c Ratio	0.87	0.92	0.76	0.83	0.91	0.94	0.45	0.41	0.45	0.60
Control Delay	71.8	57.8	3.5	80.0	56.6	42.3	13.7	57.1	57.0	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	57.8	3.5	80.0	56.6	42.3	13.7	57.1	57.0	29.1
Queue Length 50th (ft)	120	300	0	70	243	501	98	42	51	96
Queue Length 95th (ft)	#211	#446	0	#139	#347	#702	190	86	98	179
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	377	878	1568	227	1035	1532	833	289	310	417
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.92	0.76	0.83	0.91	0.94	0.45	0.21	0.24	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	301	745	1093	173	801	68	1321	82	265	56	67	229
Future Volume (veh/h)	301	745	1093	173	801	68	1321	82	265	56	67	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	327	810	0	188	871	74	1436	89	0	61	73	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	346	802		209	892	76	1403	947		91	283	398
Arrive On Green	0.10	0.23	0.00	0.06	0.19	0.19	0.41	0.51	0.00	0.05	0.15	0.15
Sat Flow, veh/h	3428	3526	1572	3428	4757	403	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	327	810	0	188	617	328	1436	89	0	61	73	249
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1689	1783	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	11.4	27.3	0.0	6.5	21.8	21.9	49.1	3.0	0.0	4.1	4.2	16.9
Cycle Q Clear(g_c), s	11.4	27.3	0.0	6.5	21.8	21.9	49.1	3.0	0.0	4.1	4.2	16.9
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	802		209	633	334	1403	947		91	283	398
V/C Ratio(X)	0.95	1.01		0.90	0.98	0.98	1.02	0.09		0.67	0.26	0.63
Avail Cap(c_a), veh/h	346	802		209	633	334	1403	947		265	283	398
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.6	46.3	0.0	56.0	48.5	48.5	35.4	15.1	0.0	55.9	44.9	39.7
Incr Delay (d2), s/veh	34.5	34.2	0.0	36.6	29.5	43.6	30.2	0.0	0.0	8.4	0.5	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	15.4	0.0	3.8	11.6	13.6	25.8	1.3	0.0	2.0	2.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.1	80.6	0.0	92.6	77.9	92.1	65.7	15.1	0.0	64.3	45.3	42.8
LnGrp LOS	F	F		F	E	F	F	B		E	D	D
Approach Vol, veh/h		1137			1133			1525			383	
Approach Delay, s/veh		82.8			84.5			62.7			46.7	
Approach LOS		F			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	65.8	11.8	31.8	53.6	22.8	16.6	27.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	49.4	7.3	27.3	49.1	18.3	12.1	22.5
Max Q Clear Time (g_c+I1), s	6.1	5.0	8.5	29.3	51.1	18.9	13.4	23.9
Green Ext Time (p_c), s	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	72.6
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	327	810	1188	188	945	1436	377	61	73	249
v/c Ratio	0.64	0.86	0.76	0.51	0.82	0.80	0.54	0.38	0.41	0.51
Control Delay	47.2	46.9	3.5	48.8	45.2	32.2	17.2	52.3	52.0	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	46.9	3.5	48.8	45.2	32.2	17.2	52.3	52.0	22.3
Queue Length 50th (ft)	103	268	0	59	216	289	106	38	45	79
Queue Length 95th (ft)	165	#461	0	106	#366	372	206	85	97	165
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	630	947	1568	450	1150	2330	876	334	381	537
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.86	0.76	0.42	0.82	0.62	0.43	0.18	0.19	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	301	745	1093	173	801	68	1321	82	265	56	67	229
Future Volume (veh/h)	301	745	1093	173	801	68	1321	82	265	56	67	229
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	327	810	0	188	871	74	1436	89	0	61	73	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	405	871		258	971	82	1704	830		96	296	437
Arrive On Green	0.12	0.25	0.00	0.08	0.20	0.20	0.34	0.45	0.00	0.05	0.16	0.16
Sat Flow, veh/h	3428	3526	1572	3428	4757	403	4983	1856	0	1767	1856	1572
Grp Volume(v), veh/h	327	810	0	188	617	328	1436	89	0	61	73	249
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1689	1783	1661	1856	0	1767	1856	1572
Q Serve(g_s), s	9.5	23.0	0.0	5.5	18.2	18.3	27.2	2.8	0.0	3.5	3.5	13.9
Cycle Q Clear(g_c), s	9.5	23.0	0.0	5.5	18.2	18.3	27.2	2.8	0.0	3.5	3.5	13.9
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	405	871		258	689	364	1704	830		96	296	437
V/C Ratio(X)	0.81	0.93		0.73	0.90	0.90	0.84	0.11		0.64	0.25	0.57
Avail Cap(c_a), veh/h	587	880		419	689	364	2170	835		311	354	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	37.6	0.0	46.2	39.6	39.7	31.1	16.4	0.0	47.3	37.6	31.7
Incr Delay (d2), s/veh	5.3	16.0	0.0	3.9	14.4	24.4	2.6	0.1	0.0	6.8	0.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	11.4	0.0	2.4	8.7	10.2	11.0	1.2	0.0	1.7	1.6	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.2	53.6	0.0	50.2	54.0	64.1	33.7	16.4	0.0	54.2	38.0	32.9
LnGrp LOS	D	D		D	D	E	C	B		D	D	C
Approach Vol, veh/h		1137			1133			1525			383	
Approach Delay, s/veh		52.3			56.3			32.7			37.3	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	50.2	12.2	29.8	39.4	20.8	16.6	25.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	46.0	12.5	25.5	44.5	19.5	17.5	20.5
Max Q Clear Time (g_c+I1), s	5.5	4.8	7.5	25.0	29.2	15.9	11.5	20.3
Green Ext Time (p_c), s	0.1	0.5	0.2	0.3	5.7	0.4	0.6	0.1

Intersection Summary			
HCM 6th Ctrl Delay			44.8
HCM 6th LOS			D

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBR
Lane Group Flow (vph)	14	769	1155	188	714	1306	305	4
v/c Ratio	0.16	0.82	0.74	0.79	0.35	0.84	0.30	0.02
Control Delay	48.4	42.3	3.1	65.5	21.2	29.1	0.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	42.3	3.1	65.5	21.2	29.1	0.8	0.2
Queue Length 50th (ft)	8	235	0	115	101	354	0	0
Queue Length 95th (ft)	28	#311	0	#227	156	448	0	0
Internal Link Dist (ft)		1084			414		644	
Turn Bay Length (ft)	230			215		425		
Base Capacity (vph)	89	934	1568	237	2061	1562	1021	209
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.82	0.74	0.79	0.35	0.84	0.30	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	769	1155	188	714	0	1306	0	305	0	0	4
Future Volume (veh/h)	14	769	1155	188	714	0	1306	0	305	0	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	14	769	0	188	714	0	1306	0	0	0	0	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	889		222	1831	0	1448	884		2	10	34
Arrive On Green	0.02	0.25	0.00	0.13	0.36	0.00	0.42	0.00	0.00	0.00	0.00	0.01
Sat Flow, veh/h	1767	3526	1572	1767	5233	0	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	14	769	0	188	714	0	1306	0	0	0	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	0	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	0.7	19.3	0.0	9.6	9.7	0.0	32.9	0.0	0.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.7	19.3	0.0	9.6	9.7	0.0	32.9	0.0	0.0	0.0	0.0	0.2
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	29	889		222	1831	0	1448	884		2	10	34
V/C Ratio(X)	0.49	0.86		0.85	0.39	0.00	0.90	0.00		0.00	0.00	0.12
Avail Cap(c_a), veh/h	96	991		252	1873	0	1660	899		344	361	332
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	45.1	33.1	0.0	39.6	21.9	0.0	24.9	0.0	0.0	0.0	0.0	44.4
Incr Delay (d2), s/veh	12.1	7.5	0.0	20.8	0.1	0.0	6.6	0.0	0.0	0.0	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	8.7	0.0	5.3	3.6	0.0	14.0	0.0	0.0	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	40.5	0.0	60.4	22.1	0.0	31.6	0.0	0.0	0.0	0.0	45.9
LnGrp LOS	E	D		E	C	A	C	A		A	A	D
Approach Vol, veh/h		783			902			1306			4	
Approach Delay, s/veh		40.8			30.1			31.6			45.9	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	48.5	16.1	27.8	43.6	5.0	6.0	37.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	44.8	13.2	26.0	44.8	18.0	5.0	34.2
Max Q Clear Time (g_c+I1), s	0.0	0.0	11.6	21.3	34.9	2.2	2.7	11.7
Green Ext Time (p_c), s	0.0	0.0	0.1	2.0	4.2	0.0	0.0	4.7

Intersection Summary			
HCM 6th Ctrl Delay			33.6
HCM 6th LOS			C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	72	849	334	39	775	161	40	2	2
v/c Ratio	0.20	0.40	0.31	0.12	0.41	0.22	0.07	0.01	0.00
Control Delay	24.9	9.8	2.6	26.3	12.1	23.0	0.2	29.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	9.8	2.6	26.3	12.1	23.0	0.2	29.5	0.0
Queue Length 50th (ft)	18	45	0	10	85	20	0	1	0
Queue Length 95th (ft)	71	214	44	46	202	66	0	8	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	784	3284	1490	531	3181	1523	1188	329	969
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.26	0.22	0.07	0.24	0.11	0.03	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	781	307	36	713	0	148	0	37	2	0	2
Future Volume (veh/h)	66	781	307	36	713	0	148	0	37	2	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	72	849	0	39	775	0	161	0	40	2	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	118	1386		76	1303	0	340	267	226	5	0	75
Arrive On Green	0.07	0.39	0.00	0.04	0.37	0.00	0.10	0.00	0.14	0.00	0.00	0.05
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	72	849	0	39	775	0	161	0	40	2	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.7	8.3	0.0	0.9	7.7	0.0	1.9	0.0	1.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.7	8.3	0.0	0.9	7.7	0.0	1.9	0.0	1.0	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	118	1386		76	1303	0	340	267	226	5	0	75
V/C Ratio(X)	0.61	0.61		0.51	0.59	0.00	0.47	0.00	0.18	0.41	0.00	0.03
Avail Cap(c_a), veh/h	635	4533		430	4125	0	1231	1268	1075	266	0	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.6	10.5	0.0	20.2	11.0	0.0	18.4	0.0	16.2	21.5	0.0	19.6
Incr Delay (d2), s/veh	5.0	0.4	0.0	5.2	0.4	0.0	1.0	0.0	0.4	47.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.3	0.0	0.4	2.2	0.0	0.7	0.0	0.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	10.9	0.0	25.4	11.4	0.0	19.4	0.0	16.6	69.2	0.0	19.7
LnGrp LOS	C	B		C	B	A	B	A	B	E	A	B
Approach Vol, veh/h		921			814			201			4	
Approach Delay, s/veh		12.0			12.1			18.9			44.5	
Approach LOS		B			B			B			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.6	10.7	6.4	21.5	8.8	6.5	7.4	20.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	29.5	10.5	55.5	15.5	20.5	15.5	50.5				
Max Q Clear Time (g_c+I1), s	2.0	3.0	2.9	10.3	3.9	2.1	3.7	9.7				
Green Ext Time (p_c), s	0.0	0.1	0.0	6.7	0.4	0.0	0.1	5.9				
Intersection Summary												
HCM 6th Ctrl Delay			12.8									
HCM 6th LOS			B									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	566	245	33	616	159	22
v/c Ratio	0.30	0.25	0.08	0.30	0.17	0.05
Control Delay	7.4	2.5	15.1	5.1	12.9	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	2.5	15.1	5.1	12.9	8.1
Queue Length 50th (ft)	26	0	4	28	10	0
Queue Length 95th (ft)	95	34	28	53	41	14
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1345	3505	3008	1389
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.16	0.02	0.18	0.05	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	521	225	30	567	146	20
Future Volume (veh/h)	521	225	30	567	146	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	566	245	33	616	159	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1174	524	260	2162	414	190
Arrive On Green	0.33	0.33	0.15	0.61	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	566	245	33	616	159	22
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	4.3	4.2	0.5	2.8	1.4	0.4
Cycle Q Clear(g_c), s	4.3	4.2	0.5	2.8	1.4	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1174	524	260	2162	414	190
V/C Ratio(X)	0.48	0.47	0.13	0.28	0.38	0.12
Avail Cap(c_a), veh/h	5572	2485	1227	8488	2988	1370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	8.9	12.5	3.1	13.7	13.3
Incr Delay (d2), s/veh	0.3	0.7	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.9	0.2	0.1	0.4	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.3	9.6	12.8	3.1	14.3	13.5
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	811			649	181	
Approach Delay, s/veh	9.4			3.6	14.2	
Approach LOS	A			A	B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		8.6	9.5	15.8				25.3
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		29.5	23.5	53.5				81.5
Max Q Clear Time (g_c+I1), s		3.4	2.5	6.3				4.8
Green Ext Time (p_c), s		0.6	0.0	5.0				4.5

Intersection Summary	
HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	1323	202	1088	39	29	174	195	99
v/c Ratio	0.49	0.84	0.71	0.57	0.04	0.09	0.34	0.80	0.22
Control Delay	57.3	31.1	57.5	18.9	2.6	32.1	8.6	61.1	9.8
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	31.3	57.5	18.9	2.6	32.1	8.6	61.1	9.8
Queue Length 50th (ft)	60	396	134	253	0	16	8	129	5
Queue Length 95th (ft)	122	590	#249	396	12	40	61	220	47
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	240	1880	357	2128	974	474	691	376	648
Starvation Cap Reductn	0	113	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.75	0.57	0.51	0.04	0.06	0.25	0.52	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1179	38	186	1001	36	27	13	147	179	9	82
Future Volume (veh/h)	83	1179	38	186	1001	36	27	13	147	179	9	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	1282	41	202	1088	39	29	14	160	195	10	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	116	1547	49	239	1811	808	372	36	406	303	45	398
Arrive On Green	0.07	0.44	0.44	0.14	0.51	0.51	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1767	3487	111	1767	3526	1572	1286	128	1464	1201	161	1436
Grp Volume(v), veh/h	90	648	675	202	1088	39	29	0	174	195	0	99
Grp Sat Flow(s),veh/h/ln	1767	1763	1835	1767	1763	1572	1286	0	1592	1201	0	1597
Q Serve(g_s), s	4.7	30.3	30.4	10.5	20.4	1.2	1.7	0.0	8.3	14.8	0.0	4.5
Cycle Q Clear(g_c), s	4.7	30.3	30.4	10.5	20.4	1.2	6.2	0.0	8.3	23.1	0.0	4.5
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.92	1.00		0.90
Lane Grp Cap(c), veh/h	116	782	814	239	1811	808	372	0	441	303	0	443
V/C Ratio(X)	0.78	0.83	0.83	0.84	0.60	0.05	0.08	0.00	0.39	0.64	0.00	0.22
Avail Cap(c_a), veh/h	247	967	1007	367	2174	970	501	0	602	424	0	604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.2	23.0	23.0	39.6	16.1	11.4	28.5	0.0	27.5	36.9	0.0	26.2
Incr Delay (d2), s/veh	10.6	5.0	4.9	10.4	0.3	0.0	0.1	0.0	0.6	2.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	13.0	13.5	5.2	7.8	0.4	0.5	0.0	3.2	4.4	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.9	28.0	27.9	50.1	16.4	11.4	28.6	0.0	28.1	39.2	0.0	26.4
LnGrp LOS	D	C	C	D	B	B	C	A	C	D	A	C
Approach Vol, veh/h		1413			1329			203			294	
Approach Delay, s/veh		29.6			21.4			28.2			34.9	
Approach LOS		C			C			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		30.5	17.2	46.2		30.5	10.6	52.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		35.5	19.5	51.5		35.5	13.1	57.9				
Max Q Clear Time (g_c+I1), s		10.3	12.5	32.4		25.1	6.7	22.4				
Green Ext Time (p_c), s		1.2	0.3	9.2		0.9	0.1	10.2				
Intersection Summary												
HCM 6th Ctrl Delay			26.6									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	80	1073	335	751	102	46	230	107	43	51
v/c Ratio	0.47	0.82	0.81	0.40	0.52	0.29	0.67	0.53	0.20	0.17
Control Delay	54.5	35.3	53.1	15.4	52.8	49.4	16.3	52.6	46.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	35.3	53.1	15.4	52.8	49.4	16.3	52.6	46.4	1.2
Queue Length 50th (ft)	50	321	201	139	63	29	0	66	27	0
Queue Length 95th (ft)	106	#514	#390	240	123	67	73	128	64	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	217	1376	459	1862	325	377	503	325	377	429
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.78	0.73	0.40	0.31	0.12	0.46	0.33	0.11	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	912	75	308	564	127	94	42	212	98	40	47
Future Volume (veh/h)	74	912	75	308	564	127	94	42	212	98	40	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	80	991	82	335	613	138	102	46	230	107	43	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	103	1157	96	373	1441	324	140	311	264	145	316	268
Arrive On Green	0.06	0.35	0.35	0.21	0.50	0.50	0.08	0.17	0.17	0.08	0.17	0.17
Sat Flow, veh/h	1767	3296	273	1767	2860	643	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	80	530	543	335	377	374	102	46	230	107	43	51
Grp Sat Flow(s),veh/h/ln	1767	1763	1806	1767	1763	1740	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	4.3	26.7	26.7	17.6	12.9	13.0	5.4	2.0	13.6	5.7	1.9	2.7
Cycle Q Clear(g_c), s	4.3	26.7	26.7	17.6	12.9	13.0	5.4	2.0	13.6	5.7	1.9	2.7
Prop In Lane	1.00		0.15	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	103	619	634	373	888	876	140	311	264	145	316	268
V/C Ratio(X)	0.78	0.86	0.86	0.90	0.42	0.43	0.73	0.15	0.87	0.74	0.14	0.19
Avail Cap(c_a), veh/h	224	710	728	472	957	945	335	386	327	335	386	327
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	28.8	28.8	36.7	15.0	15.0	43.0	33.9	38.8	42.9	33.7	34.0
Incr Delay (d2), s/veh	11.7	9.1	9.0	16.9	0.3	0.3	7.1	0.2	18.7	7.2	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	12.4	12.7	9.2	5.0	5.0	2.6	0.9	6.5	2.7	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.1	37.9	37.7	53.6	15.3	15.3	50.1	34.2	57.5	50.1	33.8	34.3
LnGrp LOS	E	D	D	D	B	B	D	C	E	D	C	C
Approach Vol, veh/h		1153			1086			378			201	
Approach Delay, s/veh		39.1			27.1			52.7			42.6	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	20.5	24.7	38.0	12.0	20.8	10.1	52.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.1	19.9	25.5	38.5	18.1	19.9	12.1	51.9
Max Q Clear Time (g_c+I1), s	7.7	15.6	19.6	28.7	7.4	4.7	6.3	15.0
Green Ext Time (p_c), s	0.2	0.4	0.5	4.9	0.2	0.3	0.1	5.5

Intersection Summary	
HCM 6th Ctrl Delay	36.6
HCM 6th LOS	D

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	655	42	1583	86	785
v/c Ratio	0.80	0.11	0.83	0.53	0.34
Control Delay	47.3	11.6	23.0	63.5	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	11.6	23.0	63.5	7.7
Queue Length 50th (ft)	242	0	472	63	113
Queue Length 95th (ft)	318	32	587	120	146
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	1028	459	2297	194	2744
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.09	0.69	0.44	0.29

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	598	43	1040	417	79	722
Future Volume (veh/h)	598	43	1040	417	79	722
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	650	47	1130	453	86	785
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	777	346	1413	552	110	2405
Arrive On Green	0.22	0.22	0.57	0.57	0.06	0.68
Sat Flow, veh/h	3534	1572	2570	967	1767	3618
Grp Volume(v), veh/h	650	47	795	788	86	785
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1681	1767	1763
Q Serve(g_s), s	16.1	2.2	32.4	34.8	4.4	8.4
Cycle Q Clear(g_c), s	16.1	2.2	32.4	34.8	4.4	8.4
Prop In Lane	1.00	1.00		0.58	1.00	
Lane Grp Cap(c), veh/h	777	346	1006	959	110	2405
V/C Ratio(X)	0.84	0.14	0.79	0.82	0.78	0.33
Avail Cap(c_a), veh/h	1097	488	1295	1236	202	3167
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	28.8	15.4	15.9	42.4	6.0
Incr Delay (d2), s/veh	4.0	0.2	2.6	3.6	11.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.8	12.4	12.9	2.2	2.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.3	29.0	18.0	19.5	53.6	6.1
LnGrp LOS	D	C	B	B	D	A
Approach Vol, veh/h	697		1583			871
Approach Delay, s/veh	37.7		18.8			10.7
Approach LOS	D		B			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.2	56.9				67.1		24.7
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	67.5				82.5		28.5
Max Q Clear Time (g_c+I1), s	6.4	36.8				10.4		18.1
Green Ext Time (p_c), s	0.1	15.6				6.8		2.1

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	184	232	543	387	177
v/c Ratio	0.45	0.12	0.56	0.47	0.37
Control Delay	21.1	5.2	10.1	16.9	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	5.2	10.1	16.9	6.3
Queue Length 50th (ft)	42	12	28	40	0
Queue Length 95th (ft)	111	30	79	92	45
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1283	3505	2639	2577	1144
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.07	0.21	0.15	0.15

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	169	213	212	288	265	254
Future Volume (veh/h)	169	213	212	288	265	254
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	184	232	230	313	370	188
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	250	2003	554	494	734	327
Arrive On Green	0.14	0.57	0.31	0.31	0.21	0.21
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	184	232	230	313	370	188
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	4.0	1.2	4.1	6.8	3.7	4.3
Cycle Q Clear(g_c), s	4.0	1.2	4.1	6.8	3.7	4.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	250	2003	554	494	734	327
V/C Ratio(X)	0.74	0.12	0.41	0.63	0.50	0.58
Avail Cap(c_a), veh/h	1475	6631	1647	1469	3126	1391
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.5	4.0	10.8	11.8	14.1	14.3
Incr Delay (d2), s/veh	4.2	0.0	0.5	1.3	0.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.2	1.3	2.0	1.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.7	4.0	11.3	13.1	14.6	15.9
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		416	543		558	
Approach Delay, s/veh		11.4	12.4		15.0	
Approach LOS		B	B		B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	27.3	12.8	10.2	17.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	75.5	35.5	33.5	37.5
Max Q Clear Time (g_c+I1), s	3.2	6.3	6.0	8.8
Green Ext Time (p_c), s	1.7	2.0	0.5	3.8

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	15	430	2	23	426	136	26	337
v/c Ratio	0.24	0.05	0.68	0.01	0.10	0.69	0.07	0.13	0.48
Control Delay	34.5	26.3	9.5	38.0	21.8	25.5	9.0	36.6	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	26.3	9.5	38.0	21.8	25.5	9.0	36.6	24.2
Queue Length 50th (ft)	15	4	0	1	2	100	5	7	38
Queue Length 95th (ft)	72	25	86	9	27	323	38	43	131
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	308	1009	1052	178	794	1397	3102	211	1362
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.01	0.41	0.01	0.03	0.30	0.04	0.12	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	14	396	2	7	14	392	123	2	24	218	92
Future Volume (veh/h)	51	14	396	2	7	14	392	123	2	24	218	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	55	15	430	2	8	15	426	134	2	26	237	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	84	571	484	5	152	285	492	1410	21	50	358	147
Arrive On Green	0.05	0.31	0.31	0.00	0.26	0.26	0.28	0.40	0.40	0.03	0.15	0.15
Sat Flow, veh/h	1767	1856	1572	1767	578	1083	1767	3556	53	1767	2440	999
Grp Volume(v), veh/h	55	15	430	2	0	23	426	66	70	26	169	168
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1661	1767	1763	1846	1767	1763	1676
Q Serve(g_s), s	2.1	0.4	17.7	0.1	0.0	0.7	15.6	1.6	1.6	1.0	6.2	6.5
Cycle Q Clear(g_c), s	2.1	0.4	17.7	0.1	0.0	0.7	15.6	1.6	1.6	1.0	6.2	6.5
Prop In Lane	1.00		1.00	1.00		0.65	1.00		0.03	1.00		0.60
Lane Grp Cap(c), veh/h	84	571	484	5	0	437	492	699	732	50	259	246
V/C Ratio(X)	0.66	0.03	0.89	0.42	0.00	0.05	0.87	0.09	0.10	0.52	0.65	0.68
Avail Cap(c_a), veh/h	247	804	682	143	0	622	1181	1567	1641	169	557	529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	16.4	22.4	33.9	0.0	18.7	23.4	12.9	12.9	32.6	27.4	27.5
Incr Delay (d2), s/veh	8.4	0.0	10.3	48.4	0.0	0.0	4.8	0.1	0.1	7.9	2.8	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.2	7.4	0.1	0.0	0.3	6.6	0.6	0.6	0.5	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.2	16.5	32.8	82.3	0.0	18.8	28.1	12.9	12.9	40.5	30.2	30.9
LnGrp LOS	D	B	C	F	A	B	C	B	B	D	C	C
Approach Vol, veh/h		500			25			562			363	
Approach Delay, s/veh		33.1			23.9			24.4			31.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	31.5	4.7	25.5	23.4	14.5	7.7	22.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	60.5	5.5	29.5	45.5	21.5	9.5	25.5
Max Q Clear Time (g_c+I1), s	3.0	3.6	2.1	19.7	17.6	8.5	4.1	2.7
Green Ext Time (p_c), s	0.0	0.8	0.0	1.2	1.3	1.5	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	173	443	54	223	314	408	58	570
v/c Ratio	0.58	0.42	0.32	0.48	0.71	0.29	0.34	0.69
Control Delay	43.8	15.8	47.5	35.2	39.6	17.2	47.6	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	15.8	47.5	35.2	39.6	17.2	47.6	28.0
Queue Length 50th (ft)	81	48	26	46	144	69	28	101
Queue Length 95th (ft)	193	120	82	110	303	126	87	211
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	483	1404	213	826	760	2296	218	1283
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.32	0.25	0.27	0.41	0.18	0.27	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	192	215	50	151	54	289	303	73	53	298	226
Future Volume (veh/h)	159	192	215	50	151	54	289	303	73	53	298	226
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	173	209	0	54	164	0	314	329	0	58	324	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	229	635		94	366		397	1183		99	589	
Arrive On Green	0.13	0.18	0.00	0.05	0.10	0.00	0.22	0.34	0.00	0.06	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	173	209	0	54	164	0	314	329	0	58	324	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	4.5	2.5	0.0	1.4	2.1	0.0	8.0	3.3	0.0	1.5	4.0	0.0
Cycle Q Clear(g_c), s	4.5	2.5	0.0	1.4	2.1	0.0	8.0	3.3	0.0	1.5	4.0	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	229	635		94	366		397	1183		99	589	
V/C Ratio(X)	0.75	0.33		0.57	0.45		0.79	0.28		0.59	0.55	
Avail Cap(c_a), veh/h	791	2239		350	1358		1244	3840		357	2070	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.2	17.2	0.0	22.2	20.2	0.0	17.6	11.7	0.0	22.1	18.3	0.0
Incr Delay (d2), s/veh	5.0	0.3	0.0	5.3	0.9	0.0	3.6	0.1	0.0	5.4	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.9	0.0	0.7	0.8	0.0	3.2	1.1	0.0	0.7	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	17.5	0.0	27.5	21.1	0.0	21.1	11.8	0.0	27.5	19.2	0.0
LnGrp LOS	C	B		C	C		C	B		C	B	
Approach Vol, veh/h		382			218			643			382	
Approach Delay, s/veh		20.9			22.7			16.4			20.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	20.6	7.1	13.1	15.3	12.5	10.7	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.7	52.3	9.5	30.5	33.8	28.2	21.5	18.5
Max Q Clear Time (g_c+I1), s	3.5	5.3	3.4	4.5	10.0	6.0	6.5	4.1
Green Ext Time (p_c), s	0.0	2.3	0.0	1.3	0.9	2.0	0.4	0.7

Intersection Summary			
HCM 6th Ctrl Delay			19.2
HCM 6th LOS			B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	605	318	421	246	253
v/c Ratio	0.64	0.64	0.19	0.58	0.44
Control Delay	22.8	30.1	6.2	31.4	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	30.1	6.2	31.4	6.6
Queue Length 50th (ft)	90	110	32	86	0
Queue Length 95th (ft)	202	260	73	212	58
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1746	1091	3340	953	968
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.29	0.13	0.26	0.26

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	345	212	293	387	226	233
Future Volume (veh/h)	345	212	293	387	226	233
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	375	230	318	421	246	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	584	353	401	2096	393	350
Arrive On Green	0.28	0.28	0.23	0.59	0.22	0.22
Sat Flow, veh/h	2205	1276	1767	3618	1767	1572
Grp Volume(v), veh/h	312	293	318	421	246	253
Grp Sat Flow(s),veh/h/ln	1763	1626	1767	1763	1767	1572
Q Serve(g_s), s	7.7	7.8	8.3	2.7	6.2	7.3
Cycle Q Clear(g_c), s	7.7	7.8	8.3	2.7	6.2	7.3
Prop In Lane		0.79	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	487	449	401	2096	393	350
V/C Ratio(X)	0.64	0.65	0.79	0.20	0.63	0.72
Avail Cap(c_a), veh/h	1165	1074	1419	5483	1239	1103
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	15.7	17.9	4.6	17.3	17.7
Incr Delay (d2), s/veh	1.4	1.6	3.6	0.0	1.6	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.6	3.3	0.6	2.4	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.1	17.3	21.5	4.6	18.9	20.5
LnGrp LOS	B	B	C	A	B	C
Approach Vol, veh/h	605			739	499	
Approach Delay, s/veh	17.2			11.9	19.7	
Approach LOS	B			B	B	

Timer - Assigned Phs		2	3	4			8
Phs Duration (G+Y+Rc), s		15.4	15.7	18.1			33.7
Change Period (Y+Rc), s		4.5	4.5	4.5			4.5
Max Green Setting (Gmax), s		34.5	39.5	32.5			76.5
Max Q Clear Time (g_c+I1), s		9.3	10.3	9.8			4.7
Green Ext Time (p_c), s		1.6	1.0	3.8			3.0

Intersection Summary			
HCM 6th Ctrl Delay			15.8
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	1021	59	636	286	152	2	10
v/c Ratio	0.15	0.71	0.29	0.36	0.66	0.24	0.01	0.02
Control Delay	44.8	21.6	42.9	13.6	33.5	1.4	22.0	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.8	21.6	42.9	13.6	33.5	1.4	22.0	13.1
Queue Length 50th (ft)	11	188	25	71	115	0	1	0
Queue Length 95th (ft)	47	362	84	197	259	7	7	13
Internal Link Dist (ft)		424		851		1161		269
Turn Bay Length (ft)	125		125		75			
Base Capacity (vph)	177	2367	286	2594	901	1099	779	1042
Starvation Cap Reductn	0	87	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.45	0.21	0.25	0.32	0.14	0.00	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	662	277	54	585	0	263	0	140	2	1	8
Future Volume (veh/h)	23	662	277	54	585	0	263	0	140	2	1	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	720	301	59	636	0	286	0	152	2	1	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	51	1037	434	96	1599	0	499	0	420	365	43	384
Arrive On Green	0.03	0.43	0.43	0.05	0.45	0.00	0.27	0.00	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1767	2423	1013	1767	3618	0	1394	0	1572	1225	160	1437
Grp Volume(v), veh/h	25	524	497	59	636	0	286	0	152	2	0	10
Grp Sat Flow(s),veh/h/ln	1767	1763	1673	1767	1763	0	1394	0	1572	1225	0	1597
Q Serve(g_s), s	0.8	13.0	13.0	1.8	6.5	0.0	10.3	0.0	4.2	0.1	0.0	0.2
Cycle Q Clear(g_c), s	0.8	13.0	13.0	1.8	6.5	0.0	10.5	0.0	4.2	4.3	0.0	0.2
Prop In Lane	1.00		0.61	1.00		0.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	51	755	716	96	1599	0	499	0	420	365	0	426
V/C Ratio(X)	0.49	0.69	0.69	0.61	0.40	0.00	0.57	0.00	0.36	0.01	0.00	0.02
Avail Cap(c_a), veh/h	213	1652	1568	344	3566	0	1304	0	1328	1072	0	1348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.8	12.5	12.5	24.9	9.8	0.0	18.4	0.0	16.0	17.8	0.0	14.6
Incr Delay (d2), s/veh	7.0	1.2	1.2	6.2	0.2	0.0	1.0	0.0	0.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.3	4.1	0.8	2.0	0.0	3.1	0.0	1.4	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	13.7	13.8	31.1	10.0	0.0	19.5	0.0	16.5	17.8	0.0	14.6
LnGrp LOS	C	B	B	C	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1046			695			438			12	
Approach Delay, s/veh		14.2			11.8			18.5			15.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.9	7.4	27.6		18.9	6.1	28.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		45.5	10.5	50.5		45.5	6.5	54.5				
Max Q Clear Time (g_c+I1), s		12.5	3.8	15.0		6.3	2.8	8.5				
Green Ext Time (p_c), s		1.9	0.0	8.0		0.0	0.0	4.8				

Intersection Summary			
HCM 6th Ctrl Delay			14.3
HCM 6th LOS			B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1531	1047	949	347	396	1501
v/c Ratio	1.03	0.40	1.03	0.58	0.63	0.82
Control Delay	65.0	6.4	80.0	14.7	50.1	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	47.7
Total Delay	65.0	6.4	80.0	14.7	50.1	67.5
Queue Length 50th (ft)	~654	138	~412	56	146	447
Queue Length 95th (ft)	#791	170	#543	155	200	569
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	1487	2590	925	601	631	1828
Starvation Cap Reductn	0	0	0	0	0	467
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.40	1.03	0.58	0.63	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1378	942	854	312	356	1351
Future Volume (veh/h)	1378	942	854	312	356	1351
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1531	1047	949	347	396	1501
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1500	2606	931	415	637	1725
Arrive On Green	0.44	0.74	0.26	0.26	0.19	0.19
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768
Grp Volume(v), veh/h	1531	1047	949	347	396	1501
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384
Q Serve(g_s), s	52.5	13.2	31.7	25.0	12.8	22.3
Cycle Q Clear(g_c), s	52.5	13.2	31.7	25.0	12.8	22.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	1500	2606	931	415	637	1725
V/C Ratio(X)	1.02	0.40	1.02	0.84	0.62	0.87
Avail Cap(c_a), veh/h	1500	2606	931	415	637	1725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	5.8	44.1	41.7	45.0	18.6
Incr Delay (d2), s/veh	28.6	0.1	34.3	13.8	4.5	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	26.8	4.2	18.0	21.7	5.8	35.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	62.4	5.9	78.5	55.4	49.5	24.9
LnGrp LOS	F	A	F	E	D	C
Approach Vol, veh/h		2578	1296		1897	
Approach Delay, s/veh		39.4	72.3		30.0	
Approach LOS		D	E		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				93.2		26.8	57.0	36.2
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				88.7		22.3	52.5	31.7
Max Q Clear Time (g_c+I1), s				15.2		24.3	54.5	33.7
Green Ext Time (p_c), s				9.8		0.0	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			43.7
HCM 6th LOS			D

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	114	2022	2046	262	842	137
v/c Ratio	1.01	0.73	1.20	0.34	0.63	0.21
Control Delay	156.6	27.4	131.0	25.4	39.8	15.1
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	156.6	27.4	131.0	25.4	39.8	15.1
Queue Length 50th (ft)	~59	528	~1273	155	342	40
Queue Length 95th (ft)	#128	585	#1406	225	414	89
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	113	2769	1705	763	1326	656
Starvation Cap Reductn	0	0	29	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.73	1.22	0.34	0.63	0.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	1820	1841	236	758	123
Future Volume (veh/h)	103	1820	1841	236	758	123
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	114	2022	2046	262	842	137
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	114	2786	1716	765	1337	613
Arrive On Green	0.03	0.55	0.49	0.49	0.39	0.39
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	114	2022	2046	262	842	137
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	5.0	44.8	73.0	15.4	29.8	8.7
Cycle Q Clear(g_c), s	5.0	44.8	73.0	15.4	29.8	8.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	114	2786	1716	765	1337	613
V/C Ratio(X)	1.00	0.73	1.19	0.34	0.63	0.22
Avail Cap(c_a), veh/h	114	2786	1716	765	1337	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.5	25.3	38.5	23.7	37.0	30.6
Incr Delay (d2), s/veh	83.5	1.0	92.7	0.3	2.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	17.8	52.6	5.8	13.0	9.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	156.0	26.2	131.2	24.0	39.3	31.4
LnGrp LOS	F	C	F	C	D	C
Approach Vol, veh/h		2136	2308		979	
Approach Delay, s/veh		33.2	119.0		38.2	
Approach LOS		C	F		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		87.0		63.0	9.5	77.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		46.8		31.8	7.0	75.0
Green Ext Time (p_c), s		21.8		4.0	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			70.6
HCM 6th LOS			E

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	163	491	27	84	480
v/c Ratio	0.16	0.31	0.30	0.04	0.18	0.21
Control Delay	16.2	5.7	11.2	5.8	16.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	5.7	11.2	5.8	16.1	4.2
Queue Length 50th (ft)	14	0	46	0	16	21
Queue Length 95th (ft)	46	38	92	13	50	42
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1472	1344	3456	1546	1353	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.12	0.14	0.02	0.06	0.14

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	69	150	452	25	77	442
Future Volume (veh/h)	69	150	452	25	77	442
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	163	491	27	84	480
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	281	250	992	443	266	2004
Arrive On Green	0.16	0.16	0.28	0.28	0.15	0.57
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	75	163	491	27	84	480
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	1.2	3.2	3.8	0.4	1.4	2.2
Cycle Q Clear(g_c), s	1.2	3.2	3.8	0.4	1.4	2.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	281	250	992	443	266	2004
V/C Ratio(X)	0.27	0.65	0.49	0.06	0.32	0.24
Avail Cap(c_a), veh/h	1740	1548	4965	2215	1472	8382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	13.0	9.9	8.7	12.5	3.6
Incr Delay (d2), s/veh	0.5	2.9	0.4	0.1	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.0	1.0	0.1	0.4	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.7	15.9	10.3	8.7	13.2	3.6
LnGrp LOS	B	B	B	A	B	A
Approach Vol, veh/h	238		518			564
Approach Delay, s/veh	14.9		10.2			5.0
Approach LOS	B		B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.5	13.8				23.3		9.8
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	27.5	46.5				78.5		32.5
Max Q Clear Time (g_c+I1), s	3.4	5.8				4.2		5.2
Green Ext Time (p_c), s	0.2	3.5				3.3		0.7

Intersection Summary		
HCM 6th Ctrl Delay		8.8
HCM 6th LOS		A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	153	247	117	133	183	72	926	210	183	524
v/c Ratio	0.62	0.74	0.59	0.46	0.46	0.46	0.78	0.71	0.22	0.53
Control Delay	55.9	53.8	59.5	47.7	10.6	58.6	34.5	56.2	19.5	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	53.8	59.5	47.7	10.6	58.6	34.5	56.2	19.5	3.8
Queue Length 50th (ft)	97	153	75	81	0	46	280	133	76	0
Queue Length 95th (ft)	184	268	151	159	65	103	396	239	134	60
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	334	451	249	367	459	195	1575	396	1057	1122
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.55	0.47	0.36	0.40	0.37	0.59	0.53	0.17	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	194	33	108	122	168	66	691	161	193	168	482
Future Volume (veh/h)	141	194	33	108	122	168	66	691	161	193	168	482
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	153	211	36	117	133	183	72	751	175	210	183	524
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	194	271	46	151	279	237	93	994	232	258	823	698
Arrive On Green	0.11	0.18	0.18	0.09	0.15	0.15	0.05	0.35	0.35	0.15	0.44	0.44
Sat Flow, veh/h	1767	1545	264	1767	1856	1572	1767	2838	661	1767	1856	1572
Grp Volume(v), veh/h	153	0	247	117	133	183	72	466	460	210	183	524
Grp Sat Flow(s),veh/h/ln	1767	0	1808	1767	1856	1572	1767	1763	1737	1767	1856	1572
Q Serve(g_s), s	6.2	0.0	9.7	4.8	4.9	8.3	3.0	17.3	17.3	8.5	4.5	20.6
Cycle Q Clear(g_c), s	6.2	0.0	9.7	4.8	4.9	8.3	3.0	17.3	17.3	8.5	4.5	20.6
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.38	1.00		1.00
Lane Grp Cap(c), veh/h	194	0	317	151	279	237	93	617	608	258	823	698
V/C Ratio(X)	0.79	0.00	0.78	0.78	0.48	0.77	0.78	0.76	0.76	0.81	0.22	0.75
Avail Cap(c_a), veh/h	432	0	574	322	474	401	253	1036	1020	513	1363	1155
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	0.0	29.2	33.2	28.8	30.2	34.6	21.3	21.3	30.6	12.7	17.2
Incr Delay (d2), s/veh	6.9	0.0	4.2	8.3	1.3	5.3	12.8	1.9	1.9	6.1	0.1	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	4.4	2.3	2.2	3.4	1.6	7.0	6.9	3.9	1.8	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	0.0	33.3	41.5	30.0	35.5	47.5	23.2	23.2	36.8	12.8	18.8
LnGrp LOS	D	A	C	D	C	D	D	C	C	D	B	B
Approach Vol, veh/h		400			433			998			917	
Approach Delay, s/veh		35.5			35.4			24.9			21.7	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	30.4	10.8	17.5	8.4	37.4	12.6	15.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	43.5	13.5	23.5	10.6	54.4	18.1	18.9
Max Q Clear Time (g_c+I1), s	10.5	19.3	6.8	11.7	5.0	22.6	8.2	10.3
Green Ext Time (p_c), s	0.4	6.6	0.1	1.1	0.1	3.3	0.3	0.9

Intersection Summary			
HCM 6th Ctrl Delay			27.1
HCM 6th LOS			C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	415	1113	1025	89	1680	292
v/c Ratio	0.31	0.93	0.55	0.10	0.90	0.19
Control Delay	28.2	47.5	22.1	3.4	36.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	47.5	22.1	3.4	36.3	0.3
Queue Length 50th (ft)	131	489	314	0	699	0
Queue Length 95th (ft)	173	#652	377	27	821	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1486	1289	2033	947	2033	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.86	0.50	0.09	0.83	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	382	0	1024	0	943	82	0	1546	269
Future Volume (veh/h)	0	0	0	382	0	1024	0	943	82	0	1546	269
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				415	0	1113	0	1025	89	0	1680	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1417	0	1144	0	1834	818	0	1834	
Arrive On Green				0.41	0.00	0.41	0.00	0.52	0.52	0.00	0.52	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				415	0	1113	0	1025	89	0	1680	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				11.0	0.0	53.5	0.0	26.7	3.9	0.0	59.2	0.0
Cycle Q Clear(g_c), s				11.0	0.0	53.5	0.0	26.7	3.9	0.0	59.2	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1417	0	1144	0	1834	818	0	1834	
V/C Ratio(X)				0.29	0.00	0.97	0.00	0.56	0.11	0.00	0.92	
Avail Cap(c_a), veh/h				1423	0	1148	0	1941	866	0	1941	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				26.6	0.0	39.1	0.0	22.0	16.5	0.0	29.8	0.0
Incr Delay (d2), s/veh				0.1	0.0	20.2	0.0	0.3	0.1	0.0	7.1	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.5	0.0	20.7	0.0	10.7	1.4	0.0	25.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				26.7	0.0	59.3	0.0	22.3	16.6	0.0	36.9	0.0
LnGrp LOS				C	A	E	A	C	B	A	D	
Approach Vol, veh/h					1528			1114			1680	
Approach Delay, s/veh					50.4			21.9			36.9	
Approach LOS					D			C			D	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		75.1				75.1		60.6				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		74.7				74.7		56.3				
Max Q Clear Time (g_c+I1), s		28.7				61.2		55.5				
Green Ext Time (p_c), s		9.1				9.4		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			37.8									
HCM 6th LOS			D									

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	314	769	1155	188	787	1306	393	60	73	250
v/c Ratio	0.94	0.91	0.74	0.91	0.93	0.95	0.51	0.41	0.45	0.47
Control Delay	80.8	56.4	3.1	93.0	63.1	46.8	16.5	56.1	55.8	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.8	56.4	3.1	93.0	63.1	46.8	16.5	56.1	55.8	21.0
Queue Length 50th (ft)	221	280	0	133	200	457	114	41	50	84
Queue Length 95th (ft)	#413	#418	0	#284	#300	#646	216	84	97	157
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	334	846	1568	206	843	1379	788	294	344	537
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.91	0.74	0.91	0.93	0.95	0.50	0.20	0.21	0.47

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	769	1155	188	714	73	1306	88	305	60	73	250
Future Volume (veh/h)	314	769	1155	188	714	73	1306	88	305	60	73	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	314	769	0	188	714	73	1306	88	0	60	73	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	309	778		190	716	73	1270	868		90	275	508
Arrive On Green	0.17	0.22	0.00	0.11	0.15	0.15	0.37	0.47	0.00	0.05	0.15	0.15
Sat Flow, veh/h	1767	3526	1572	1767	4673	474	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	314	769	0	188	515	272	1306	88	0	60	73	250
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1770	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	20.5	25.5	0.0	12.5	17.9	18.0	43.5	3.1	0.0	3.9	4.1	15.0
Cycle Q Clear(g_c), s	20.5	25.5	0.0	12.5	17.9	18.0	43.5	3.1	0.0	3.9	4.1	15.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	309	778		190	518	271	1270	868		90	275	508
V/C Ratio(X)	1.02	0.99		0.99	0.99	1.00	1.03	0.10		0.67	0.27	0.49
Avail Cap(c_a), veh/h	309	778		190	518	271	1270	868		271	316	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.5	45.6	0.0	52.3	49.6	49.7	37.0	17.5	0.0	54.7	44.3	32.0
Incr Delay (d2), s/veh	55.8	29.4	0.0	62.7	37.9	55.6	32.7	0.1	0.0	8.1	0.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	14.0	0.0	8.7	10.1	12.0	23.6	1.3	0.0	1.9	1.9	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	104.2	75.0	0.0	115.0	87.5	105.3	69.7	17.5	0.0	62.8	44.8	32.7
LnGrp LOS	F	E		F	F	F	F	B		E	D	C
Approach Vol, veh/h		1083			975			1394			383	
Approach Delay, s/veh		83.5			97.8			66.4			39.8	
Approach LOS		F			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	59.4	17.1	30.4	48.0	21.9	25.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	45.5	12.6	25.9	43.5	20.0	20.5	18.0
Max Q Clear Time (g_c+I1), s	5.9	5.1	14.5	27.5	45.5	17.0	22.5	20.0
Green Ext Time (p_c), s	0.1	0.5	0.0	0.0	0.0	0.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	76.5
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	72	901	347	39	838	177	40	2	2
v/c Ratio	0.24	0.51	0.36	0.15	0.54	0.28	0.07	0.01	0.00
Control Delay	26.9	11.0	2.8	28.2	13.5	24.3	0.2	31.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	11.0	2.8	28.2	13.5	24.3	0.2	31.0	0.0
Queue Length 50th (ft)	18	52	0	10	97	23	0	1	0
Queue Length 95th (ft)	75	233	44	48	227	74	0	8	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	578	3227	1471	418	3146	1199	1153	259	860
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.28	0.24	0.09	0.27	0.15	0.03	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	829	319	36	771	0	163	0	37	2	0	2
Future Volume (veh/h)	66	829	319	36	771	0	163	0	37	2	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	72	901	0	39	838	0	177	0	40	2	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	117	1441		76	1359	0	340	267	226	5	0	74
Arrive On Green	0.07	0.41	0.00	0.04	0.39	0.00	0.10	0.00	0.14	0.00	0.00	0.05
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	72	901	0	39	838	0	177	0	40	2	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.8	9.1	0.0	1.0	8.6	0.0	2.2	0.0	1.0	0.1	0.0	0.1
Cycle Q Clear(g_c), s	1.8	9.1	0.0	1.0	8.6	0.0	2.2	0.0	1.0	0.1	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	117	1441		76	1359	0	340	267	226	5	0	74
V/C Ratio(X)	0.62	0.63		0.51	0.62	0.00	0.52	0.00	0.18	0.41	0.00	0.03
Avail Cap(c_a), veh/h	572	4370		414	4055	0	1187	1222	1036	257	0	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.4	10.5	0.0	21.0	11.1	0.0	19.2	0.0	16.8	22.3	0.0	20.4
Incr Delay (d2), s/veh	5.2	0.4	0.0	5.3	0.5	0.0	1.2	0.0	0.4	47.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.5	0.0	0.5	2.5	0.0	0.8	0.0	0.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	11.0	0.0	26.3	11.5	0.0	20.4	0.0	17.2	70.0	0.0	20.5
LnGrp LOS	C	B		C	B	A	C	A	B	E	A	C
Approach Vol, veh/h		973			877			217			4	
Approach Delay, s/veh		12.0			12.2			19.8			45.3	
Approach LOS		B			B			B			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	10.9	6.4	22.8	8.9	6.6	7.5	21.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	29.5	10.5	55.5	15.5	20.5	14.5	51.5
Max Q Clear Time (g_c+I1), s	2.1	3.0	3.0	11.1	4.2	2.1	3.8	10.6
Green Ext Time (p_c), s	0.0	0.1	0.0	7.2	0.4	0.0	0.1	6.5

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	618	245	33	679	159	22
v/c Ratio	0.33	0.26	0.08	0.31	0.18	0.05
Control Delay	8.8	2.7	17.6	4.7	15.3	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	2.7	17.6	4.7	15.3	9.3
Queue Length 50th (ft)	29	0	4	33	10	0
Queue Length 95th (ft)	105	33	29	59	43	15
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1216	3505	2765	1279
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.16	0.03	0.19	0.06	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	569	225	30	625	146	20
Future Volume (veh/h)	569	225	30	625	146	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	618	245	33	679	159	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1238	552	253	2198	406	186
Arrive On Green	0.35	0.35	0.14	0.62	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	618	245	33	679	159	22
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	4.8	4.2	0.6	3.1	1.5	0.4
Cycle Q Clear(g_c), s	4.8	4.2	0.6	3.1	1.5	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1238	552	253	2198	406	186
V/C Ratio(X)	0.50	0.44	0.13	0.31	0.39	0.12
Avail Cap(c_a), veh/h	5610	2502	1140	8339	2801	1285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	8.7	13.0	3.1	14.2	13.7
Incr Delay (d2), s/veh	0.3	0.6	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.9	0.2	0.2	0.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.3	13.3	3.1	14.8	14.0
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	863			712	181	
Approach Delay, s/veh	9.2			3.6	14.7	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.6	9.5	16.8				26.2
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		28.5	22.5	55.5				82.5
Max Q Clear Time (g_c+I1), s		3.5	2.6	6.8				5.1
Green Ext Time (p_c), s		0.6	0.0	5.4				5.1

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	1418	202	1167	39	29	174	195	99
v/c Ratio	0.52	0.86	0.74	0.60	0.04	0.10	0.35	0.82	0.22
Control Delay	60.1	32.4	61.8	19.2	2.4	33.6	8.8	66.4	10.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	32.9	61.8	19.2	2.4	33.6	8.8	66.4	10.1
Queue Length 50th (ft)	64	462	141	291	0	17	8	136	6
Queue Length 95th (ft)	122	627	#258	418	12	42	63	#243	48
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	224	1887	326	2109	965	417	630	328	584
Starvation Cap Reductn	0	156	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.82	0.62	0.55	0.04	0.07	0.28	0.59	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1267	38	186	1074	36	27	13	147	179	9	82
Future Volume (veh/h)	83	1267	38	186	1074	36	27	13	147	179	9	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	1377	41	202	1167	39	29	14	160	195	10	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	115	1612	48	236	1867	833	360	35	400	292	44	392
Arrive On Green	0.07	0.46	0.46	0.13	0.53	0.53	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1767	3496	104	1767	3526	1572	1286	128	1464	1201	161	1436
Grp Volume(v), veh/h	90	694	724	202	1167	39	29	0	174	195	0	99
Grp Sat Flow(s),veh/h/ln	1767	1763	1837	1767	1763	1572	1286	0	1592	1201	0	1597
Q Serve(g_s), s	5.1	35.7	35.8	11.4	23.8	1.2	1.8	0.0	9.1	16.2	0.0	4.9
Cycle Q Clear(g_c), s	5.1	35.7	35.8	11.4	23.8	1.2	6.7	0.0	9.1	25.3	0.0	4.9
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.92	1.00		0.90
Lane Grp Cap(c), veh/h	115	813	847	236	1867	833	360	0	435	292	0	436
V/C Ratio(X)	0.78	0.85	0.86	0.86	0.63	0.05	0.08	0.00	0.40	0.67	0.00	0.23
Avail Cap(c_a), veh/h	223	941	980	325	2085	930	427	0	518	354	0	519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.0	24.5	24.5	43.3	16.9	11.6	31.4	0.0	30.3	40.6	0.0	28.8
Incr Delay (d2), s/veh	11.0	6.9	6.7	15.0	0.5	0.0	0.1	0.0	0.6	3.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	15.8	16.4	5.9	9.3	0.4	0.6	0.0	3.5	5.0	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	31.3	31.2	58.3	17.4	11.6	31.5	0.0	30.9	44.2	0.0	29.0
LnGrp LOS	E	C	C	E	B	B	C	A	C	D	A	C
Approach Vol, veh/h		1508			1408			203			294	
Approach Delay, s/veh		32.9			23.1			31.0			39.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		32.4	18.1	51.6		32.4	11.1	58.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		33.2	18.8	54.5		33.2	12.9	60.4				
Max Q Clear Time (g_c+I1), s		11.1	13.4	37.8		27.3	7.1	25.8				
Green Ext Time (p_c), s		1.1	0.3	9.3		0.6	0.1	11.2				

Intersection Summary			
HCM 6th Ctrl Delay			29.3
HCM 6th LOS			C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	80	1149	351	815	102	46	250	107	43	51
v/c Ratio	0.49	0.85	0.84	0.42	0.53	0.29	0.69	0.54	0.21	0.17
Control Delay	56.7	37.3	57.2	15.7	54.8	50.4	16.6	54.8	47.5	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	37.3	57.2	15.7	54.8	50.4	16.6	54.8	47.5	1.3
Queue Length 50th (ft)	51	357	218	156	65	29	0	68	27	0
Queue Length 95th (ft)	108	#582	#428	269	126	67	77	131	64	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	206	1353	439	1918	307	331	486	307	331	393
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.85	0.80	0.42	0.33	0.14	0.51	0.35	0.13	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	982	75	323	623	127	94	42	230	98	40	47
Future Volume (veh/h)	74	982	75	323	623	127	94	42	230	98	40	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	80	1067	82	351	677	138	102	46	250	107	43	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	103	1185	91	383	1505	307	136	325	275	141	330	280
Arrive On Green	0.06	0.36	0.36	0.22	0.52	0.52	0.08	0.17	0.17	0.08	0.18	0.18
Sat Flow, veh/h	1767	3318	255	1767	2917	594	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	80	567	582	351	409	406	102	46	250	107	43	51
Grp Sat Flow(s),veh/h/ln	1767	1763	1810	1767	1763	1749	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	4.7	32.0	32.1	20.4	15.4	15.4	5.9	2.2	16.4	6.2	2.1	2.9
Cycle Q Clear(g_c), s	4.7	32.0	32.1	20.4	15.4	15.4	5.9	2.2	16.4	6.2	2.1	2.9
Prop In Lane	1.00		0.14	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	103	630	647	383	909	902	136	325	275	141	330	280
V/C Ratio(X)	0.78	0.90	0.90	0.92	0.45	0.45	0.75	0.14	0.91	0.76	0.13	0.18
Avail Cap(c_a), veh/h	203	669	687	432	909	902	303	325	275	303	330	280
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	32.0	32.0	40.2	16.0	16.0	47.5	36.7	42.5	47.4	36.4	36.7
Incr Delay (d2), s/veh	12.0	14.7	14.5	22.7	0.3	0.4	8.0	0.2	31.5	8.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	15.8	16.2	11.2	6.1	6.0	2.9	1.0	8.7	3.0	0.9	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	46.7	46.5	63.0	16.4	16.4	55.5	36.9	74.1	55.5	36.6	37.0
LnGrp LOS	E	D	D	E	B	B	E	D	E	E	D	D
Approach Vol, veh/h		1229			1166			398			201	
Approach Delay, s/veh		47.5			30.4			65.0			46.7	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	22.9	27.3	42.1	12.6	23.2	10.6	58.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.4	25.7	39.9	18.0	18.4	12.1	53.5
Max Q Clear Time (g_c+I1), s	8.2	18.4	22.4	34.1	7.9	4.9	6.7	17.4
Green Ext Time (p_c), s	0.2	0.0	0.4	3.5	0.1	0.2	0.1	6.1

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	667	42	1674	86	849
v/c Ratio	0.84	0.12	0.84	0.59	0.36
Control Delay	51.8	11.8	23.4	69.3	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	11.8	23.4	69.3	7.7
Queue Length 50th (ft)	256	0	515	66	124
Queue Length 95th (ft)	#348	32	632	#133	156
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	900	407	2261	163	2704
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	0.10	0.74	0.53	0.31

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	609	43	1110	430	79	781
Future Volume (veh/h)	609	43	1110	430	79	781
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	662	47	1207	467	86	849
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	770	343	1469	549	110	2440
Arrive On Green	0.22	0.22	0.59	0.59	0.06	0.69
Sat Flow, veh/h	3534	1572	2603	939	1767	3618
Grp Volume(v), veh/h	662	47	835	839	86	849
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1687	1767	1763
Q Serve(g_s), s	18.0	2.4	37.4	41.1	4.8	9.8
Cycle Q Clear(g_c), s	18.0	2.4	37.4	41.1	4.8	9.8
Prop In Lane	1.00	1.00		0.56	1.00	
Lane Grp Cap(c), veh/h	770	343	1031	987	110	2440
V/C Ratio(X)	0.86	0.14	0.81	0.85	0.78	0.35
Avail Cap(c_a), veh/h	971	432	1221	1168	171	2942
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	31.5	16.4	17.1	46.3	6.2
Incr Delay (d2), s/veh	6.5	0.2	3.6	5.3	11.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	0.9	14.8	15.9	2.4	3.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	44.2	31.7	20.0	22.5	57.9	6.3
LnGrp LOS	D	C	B	C	E	A
Approach Vol, veh/h	709		1674			935
Approach Delay, s/veh	43.3		21.2			11.1
Approach LOS	D		C			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.7	63.0				73.8		26.3
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	9.7	69.3				83.5		27.5
Max Q Clear Time (g_c+I1), s	6.8	43.1				11.8		20.0
Green Ext Time (p_c), s	0.0	15.5				7.6		1.8

Intersection Summary	
HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	198	232	548	399	181
v/c Ratio	0.47	0.12	0.57	0.48	0.38
Control Delay	21.5	5.2	10.5	17.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	5.2	10.5	17.3	6.3
Queue Length 50th (ft)	46	13	30	42	0
Queue Length 95th (ft)	121	31	83	97	46
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1293	3505	2550	2529	1127
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.07	0.21	0.16	0.16

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	182	213	212	293	269	265
Future Volume (veh/h)	182	213	212	293	269	265
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	198	232	230	318	380	193
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	268	2023	553	493	739	329
Arrive On Green	0.15	0.57	0.31	0.31	0.21	0.21
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	198	232	230	318	380	193
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	4.4	1.2	4.3	7.2	3.9	4.6
Cycle Q Clear(g_c), s	4.4	1.2	4.3	7.2	3.9	4.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	268	2023	553	493	739	329
V/C Ratio(X)	0.74	0.11	0.42	0.64	0.51	0.59
Avail Cap(c_a), veh/h	1471	6420	1552	1384	3026	1346
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	4.0	11.2	12.2	14.5	14.8
Incr Delay (d2), s/veh	4.0	0.0	0.5	1.4	0.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.3	1.4	2.2	1.4	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.8	4.1	11.7	13.7	15.1	16.4
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		430	548		573	
Approach Delay, s/veh		11.8	12.9		15.5	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				28.3		13.2	10.8	17.5
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				75.5		35.5	34.5	36.5
Max Q Clear Time (g_c+I1), s				3.2		6.6	6.4	9.2
Green Ext Time (p_c), s				1.7		2.1	0.6	3.8

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	15	435	2	23	432	152	26	350
v/c Ratio	0.24	0.05	0.69	0.01	0.10	0.70	0.07	0.13	0.49
Control Delay	35.0	26.7	9.6	39.0	22.1	25.8	8.8	37.2	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	26.7	9.6	39.0	22.1	25.8	8.8	37.2	24.7
Queue Length 50th (ft)	15	4	0	1	2	104	5	7	41
Queue Length 95th (ft)	72	25	88	9	27	330	41	43	138
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	304	996	1047	163	773	1387	3095	208	1371
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.02	0.42	0.01	0.03	0.31	0.05	0.13	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	14	400	2	7	14	397	138	2	24	230	92
Future Volume (veh/h)	51	14	400	2	7	14	397	138	2	24	230	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	55	15	435	2	8	15	432	150	2	26	250	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	83	575	487	5	153	287	496	1432	19	50	371	144
Arrive On Green	0.05	0.31	0.31	0.00	0.27	0.27	0.28	0.40	0.40	0.03	0.15	0.15
Sat Flow, veh/h	1767	1856	1572	1767	578	1083	1767	3562	47	1767	2480	965
Grp Volume(v), veh/h	55	15	435	2	0	23	432	74	78	26	176	174
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1661	1767	1763	1847	1767	1763	1682
Q Serve(g_s), s	2.1	0.4	18.5	0.1	0.0	0.7	16.3	1.8	1.8	1.0	6.6	6.9
Cycle Q Clear(g_c), s	2.1	0.4	18.5	0.1	0.0	0.7	16.3	1.8	1.8	1.0	6.6	6.9
Prop In Lane	1.00		1.00	1.00		0.65	1.00		0.03	1.00		0.57
Lane Grp Cap(c), veh/h	83	575	487	5	0	441	496	709	742	50	264	252
V/C Ratio(X)	0.66	0.03	0.89	0.42	0.00	0.05	0.87	0.10	0.10	0.52	0.67	0.69
Avail Cap(c_a), veh/h	240	782	663	129	0	596	1149	1535	1608	164	552	527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	16.8	23.0	34.8	0.0	19.1	24.0	13.1	13.1	33.5	28.1	28.2
Incr Delay (d2), s/veh	8.7	0.0	11.5	48.5	0.0	0.0	4.9	0.1	0.1	8.1	2.9	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.2	7.9	0.1	0.0	0.3	6.9	0.7	0.7	0.5	2.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	16.8	34.6	83.3	0.0	19.2	28.8	13.1	13.1	41.6	31.0	31.6
LnGrp LOS	D	B	C	F	A	B	C	B	B	D	C	C
Approach Vol, veh/h		505			25			584			376	
Approach Delay, s/veh		34.8			24.3			24.7			32.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	32.6	4.7	26.2	24.1	15.0	7.8	23.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	60.9	5.1	29.5	45.5	21.9	9.5	25.1
Max Q Clear Time (g_c+I1), s	3.0	3.8	2.1	20.5	18.3	8.9	4.1	2.7
Green Ext Time (p_c), s	0.0	0.9	0.0	1.2	1.4	1.6	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	187	443	54	223	314	416	58	587
v/c Ratio	0.61	0.46	0.33	0.49	0.71	0.29	0.34	0.70
Control Delay	44.9	16.7	48.6	35.9	40.7	17.5	48.6	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	16.7	48.6	35.9	40.7	17.5	48.6	28.4
Queue Length 50th (ft)	90	49	27	47	148	72	28	107
Queue Length 95th (ft)	208	120	82	110	307	131	86	217
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	481	1378	209	792	736	2248	213	1272
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.32	0.26	0.28	0.43	0.19	0.27	0.46

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	192	215	50	151	54	289	310	73	53	303	237
Future Volume (veh/h)	172	192	215	50	151	54	289	310	73	53	303	237
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	187	209	0	54	164	0	314	337	0	58	329	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	246	663		94	359		396	1184		98	591	
Arrive On Green	0.14	0.19	0.00	0.05	0.10	0.00	0.22	0.34	0.00	0.06	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	187	209	0	54	164	0	314	337	0	58	329	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	5.0	2.5	0.0	1.5	2.1	0.0	8.2	3.4	0.0	1.6	4.2	0.0
Cycle Q Clear(g_c), s	5.0	2.5	0.0	1.5	2.1	0.0	8.2	3.4	0.0	1.6	4.2	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	246	663		94	359		396	1184		98	591	
V/C Ratio(X)	0.76	0.32		0.58	0.46		0.79	0.28		0.59	0.56	
Avail Cap(c_a), veh/h	790	2195		343	1303		1208	3764		350	2051	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.3	17.2	0.0	22.7	20.7	0.0	17.9	12.0	0.0	22.6	18.7	0.0
Incr Delay (d2), s/veh	4.8	0.3	0.0	5.5	0.9	0.0	3.6	0.1	0.0	5.5	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.9	0.0	0.7	0.8	0.0	3.3	1.1	0.0	0.7	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	17.4	0.0	28.1	21.6	0.0	21.6	12.1	0.0	28.1	19.5	0.0
LnGrp LOS	C	B		C	C		C	B		C	B	
Approach Vol, veh/h		396			218			651			387	
Approach Delay, s/veh		21.0			23.2			16.7			20.8	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	20.9	7.1	13.7	15.5	12.7	11.3	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.7	52.3	9.5	30.5	33.5	28.5	21.9	18.1
Max Q Clear Time (g_c+I1), s	3.6	5.4	3.5	4.5	10.2	6.2	7.0	4.1
Green Ext Time (p_c), s	0.0	2.3	0.0	1.3	0.9	2.0	0.4	0.7

Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	605	330	421	246	267
v/c Ratio	0.64	0.66	0.19	0.59	0.46
Control Delay	23.2	30.4	6.2	32.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	30.4	6.2	32.1	6.7
Queue Length 50th (ft)	91	115	32	88	0
Queue Length 95th (ft)	205	272	74	215	60
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1726	1105	3337	914	946
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.30	0.13	0.27	0.28

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	345	212	304	387	226	246
Future Volume (veh/h)	345	212	304	387	226	246
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	375	230	330	421	246	267
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	576	348	411	2094	406	361
Arrive On Green	0.27	0.27	0.23	0.59	0.23	0.23
Sat Flow, veh/h	2205	1276	1767	3618	1767	1572
Grp Volume(v), veh/h	312	293	330	421	246	267
Grp Sat Flow(s),veh/h/ln	1763	1626	1767	1763	1767	1572
Q Serve(g_s), s	8.0	8.1	9.0	2.8	6.3	8.0
Cycle Q Clear(g_c), s	8.0	8.1	9.0	2.8	6.3	8.0
Prop In Lane		0.79	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	481	443	411	2094	406	361
V/C Ratio(X)	0.65	0.66	0.80	0.20	0.61	0.74
Avail Cap(c_a), veh/h	1125	1037	1405	5364	1162	1034
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	16.4	18.4	4.8	17.6	18.2
Incr Delay (d2), s/veh	1.5	1.7	3.7	0.0	1.5	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	2.8	3.6	0.6	2.5	2.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.8	18.1	22.1	4.8	19.0	21.2
LnGrp LOS	B	B	C	A	B	C
Approach Vol, veh/h	605			751	513	
Approach Delay, s/veh	18.0			12.4	20.2	
Approach LOS	B			B	C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		16.2	16.4	18.4				34.7
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		33.5	40.5	32.5				77.5
Max Q Clear Time (g_c+I1), s		10.0	11.0	10.1				4.8
Green Ext Time (p_c), s		1.7	1.0	3.7				3.0

Intersection Summary	
HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	1038	59	636	307	152	2	10
v/c Ratio	0.16	0.73	0.30	0.36	0.69	0.23	0.01	0.02
Control Delay	46.8	22.7	44.9	14.3	34.6	1.4	22.5	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	22.7	44.9	14.3	34.6	1.4	22.5	13.1
Queue Length 50th (ft)	11	202	27	76	130	0	1	0
Queue Length 95th (ft)	47	382	86	204	284	8	7	12
Internal Link Dist (ft)		424		851		1161		269
Turn Bay Length (ft)	125		125		75			
Base Capacity (vph)	171	2270	276	2488	891	1088	768	1030
Starvation Cap Reductn	0	90	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.48	0.21	0.26	0.34	0.14	0.00	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	662	293	54	585	0	282	0	140	2	1	8
Future Volume (veh/h)	23	662	293	54	585	0	282	0	140	2	1	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	720	318	59	636	0	307	0	152	2	1	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	51	1018	450	94	1596	0	511	0	439	375	45	402
Arrive On Green	0.03	0.43	0.43	0.05	0.45	0.00	0.28	0.00	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1767	2379	1050	1767	3618	0	1394	0	1572	1225	160	1437
Grp Volume(v), veh/h	25	533	505	59	636	0	307	0	152	2	0	10
Grp Sat Flow(s),veh/h/ln	1767	1763	1666	1767	1763	0	1394	0	1572	1225	0	1597
Q Serve(g_s), s	0.8	14.0	14.0	1.8	6.8	0.0	11.6	0.0	4.4	0.1	0.0	0.3
Cycle Q Clear(g_c), s	0.8	14.0	14.0	1.8	6.8	0.0	11.8	0.0	4.4	4.4	0.0	0.3
Prop In Lane	1.00		0.63	1.00		0.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	51	755	713	94	1596	0	511	0	439	375	0	446
V/C Ratio(X)	0.49	0.71	0.71	0.62	0.40	0.00	0.60	0.00	0.35	0.01	0.00	0.02
Avail Cap(c_a), veh/h	203	1545	1461	329	3340	0	1269	0	1295	1042	0	1315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.0	13.2	13.2	26.2	10.3	0.0	19.0	0.0	16.2	18.0	0.0	14.8
Incr Delay (d2), s/veh	7.2	1.2	1.3	6.6	0.2	0.0	1.1	0.0	0.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.7	4.5	0.9	2.2	0.0	3.5	0.0	1.5	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	14.5	14.6	32.8	10.5	0.0	20.2	0.0	16.7	18.0	0.0	14.8
LnGrp LOS	C	B	B	C	B	A	C	A	B	B	A	B
Approach Vol, veh/h		1063			695			459			12	
Approach Delay, s/veh		15.0			12.4			19.0			15.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.3	7.5	28.7		20.3	6.1	30.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		46.5	10.5	49.5		46.5	6.5	53.5				
Max Q Clear Time (g_c+I1), s		13.8	3.8	16.0		6.4	2.8	8.8				
Green Ext Time (p_c), s		2.0	0.0	8.1		0.0	0.0	4.8				

Intersection Summary			
HCM 6th Ctrl Delay			15.0
HCM 6th LOS			B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1581	1047	949	368	413	1560
v/c Ratio	1.06	0.41	1.04	0.61	0.65	0.85
Control Delay	73.9	6.5	84.6	15.4	50.3	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	47.3
Total Delay	73.9	6.5	84.6	15.4	50.3	68.4
Queue Length 50th (ft)	~693	140	~418	61	153	480
Queue Length 95th (ft)	#829	172	#550	166	208	615
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	1493	2582	911	606	640	1839
Starvation Cap Reductn	0	0	0	0	0	447
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.41	1.04	0.61	0.65	1.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	1423	942	854	331	372	1404		
Future Volume (veh/h)	1423	942	854	331	372	1404		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	1581	1047	949	368	413	1560		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	1506	2597	917	409	646	1737		
Arrive On Green	0.44	0.74	0.26	0.26	0.19	0.19		
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768		
Grp Volume(v), veh/h	1581	1047	949	368	413	1560		
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384		
Q Serve(g_s), s	52.7	13.3	31.2	27.1	13.3	22.6		
Cycle Q Clear(g_c), s	52.7	13.3	31.2	27.1	13.3	22.6		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	1506	2597	917	409	646	1737		
V/C Ratio(X)	1.05	0.40	1.04	0.90	0.64	0.90		
Avail Cap(c_a), veh/h	1506	2597	917	409	646	1737		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	33.7	5.9	44.4	42.9	44.9	19.1		
Incr Delay (d2), s/veh	37.6	0.1	39.2	22.3	4.8	7.8		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	28.8	4.3	18.3	23.9	6.1	37.5		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	71.2	6.0	83.6	65.2	49.7	26.9		
LnGrp LOS	F	A	F	E	D	C		
Approach Vol, veh/h		2628	1317		1973			
Approach Delay, s/veh		45.2	78.5		31.7			
Approach LOS		D	E		C			
Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				92.9		27.1	57.2	35.7
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				88.4		22.6	52.7	31.2
Max Q Clear Time (g_c+I1), s				15.3		24.6	54.7	33.2
Green Ext Time (p_c), s				9.8		0.0	0.0	0.0
Intersection Summary								
HCM 6th Ctrl Delay			48.1					
HCM 6th LOS			D					

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	114	2058	2074	274	857	137
v/c Ratio	1.01	0.74	1.22	0.36	0.65	0.21
Control Delay	156.6	27.8	137.8	25.7	40.1	15.1
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	156.6	27.8	137.8	25.7	40.1	15.1
Queue Length 50th (ft)	~59	544	~1303	164	351	40
Queue Length 95th (ft)	#128	602	#1435	236	423	89
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	113	2769	1705	763	1326	656
Starvation Cap Reductn	0	0	28	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.74	1.24	0.36	0.65	0.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	1852	1867	247	771	123
Future Volume (veh/h)	103	1852	1867	247	771	123
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	114	2058	2074	274	857	137
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	114	2786	1716	765	1337	613
Arrive On Green	0.03	0.55	0.49	0.49	0.39	0.39
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	114	2058	2074	274	857	137
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	5.0	46.2	73.0	16.2	30.5	8.7
Cycle Q Clear(g_c), s	5.0	46.2	73.0	16.2	30.5	8.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	114	2786	1716	765	1337	613
V/C Ratio(X)	1.00	0.74	1.21	0.36	0.64	0.22
Avail Cap(c_a), veh/h	114	2786	1716	765	1337	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.5	25.6	38.5	23.9	37.2	30.6
Incr Delay (d2), s/veh	83.5	1.1	99.7	0.3	2.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	18.3	54.3	6.1	13.3	9.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	156.0	26.6	138.2	24.2	39.6	31.4
LnGrp LOS	F	C	F	C	D	C
Approach Vol, veh/h		2172	2348		994	
Approach Delay, s/veh		33.4	124.9		38.5	
Approach LOS		C	F		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		87.0		63.0	9.5	77.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		48.2		32.5	7.0	75.0
Green Ext Time (p_c), s		21.7		4.1	0.0	0.0

Intersection Summary						
HCM 6th Ctrl Delay			73.3			
HCM 6th LOS			E			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	184	534	27	101	515
v/c Ratio	0.22	0.41	0.47	0.05	0.27	0.26
Control Delay	18.6	6.9	13.7	5.8	18.4	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	6.9	13.7	5.8	18.4	4.4
Queue Length 50th (ft)	16	0	53	0	21	23
Queue Length 95th (ft)	50	42	104	13	61	45
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1377	1271	3409	1526	1219	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.14	0.16	0.02	0.08	0.15

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	69	169	491	25	93	474
Future Volume (veh/h)	69	169	491	25	93	474
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	184	534	27	101	515
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	308	274	1034	461	254	1998
Arrive On Green	0.17	0.17	0.29	0.29	0.14	0.57
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	75	184	534	27	101	515
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	1.3	3.8	4.4	0.4	1.8	2.6
Cycle Q Clear(g_c), s	1.3	3.8	4.4	0.4	1.8	2.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	308	274	1034	461	254	1998
V/C Ratio(X)	0.24	0.67	0.52	0.06	0.40	0.26
Avail Cap(c_a), veh/h	1655	1473	4725	2107	1401	7976
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	13.4	10.2	8.8	13.5	3.8
Incr Delay (d2), s/veh	0.4	2.9	0.4	0.1	1.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.2	1.2	0.1	0.6	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	16.3	10.6	8.9	14.5	3.9
LnGrp LOS	B	B	B	A	B	A
Approach Vol, veh/h	259		561			616
Approach Delay, s/veh	15.3		10.5			5.6
Approach LOS	B		B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.5	14.7				24.2		10.5
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	27.5	46.5				78.5		32.5
Max Q Clear Time (g_c+I1), s	3.8	6.4				4.6		5.8
Green Ext Time (p_c), s	0.2	3.8				3.6		0.8

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	153	247	117	133	183	72	961	210	183	553
v/c Ratio	0.63	0.74	0.59	0.46	0.46	0.46	0.80	0.71	0.22	0.54
Control Delay	56.5	54.4	60.2	48.1	10.6	59.2	35.3	56.7	19.4	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	54.4	60.2	48.1	10.6	59.2	35.3	56.7	19.4	3.9
Queue Length 50th (ft)	100	156	77	82	0	47	297	136	77	0
Queue Length 95th (ft)	184	268	151	159	65	103	416	239	134	62
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	330	446	246	362	455	193	1558	392	1044	1127
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.55	0.48	0.37	0.40	0.37	0.62	0.54	0.18	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	194	33	108	122	168	66	723	161	193	168	509
Future Volume (veh/h)	141	194	33	108	122	168	66	723	161	193	168	509
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	153	211	36	117	133	183	72	786	175	210	183	553
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	194	269	46	150	278	235	93	1028	229	257	838	710
Arrive On Green	0.11	0.17	0.17	0.09	0.15	0.15	0.05	0.36	0.36	0.15	0.45	0.45
Sat Flow, veh/h	1767	1545	264	1767	1856	1572	1767	2865	638	1767	1856	1572
Grp Volume(v), veh/h	153	0	247	117	133	183	72	484	477	210	183	553
Grp Sat Flow(s),veh/h/ln	1767	0	1808	1767	1856	1572	1767	1763	1741	1767	1856	1572
Q Serve(g_s), s	6.4	0.0	9.9	4.9	5.0	8.5	3.1	18.4	18.4	8.8	4.6	22.6
Cycle Q Clear(g_c), s	6.4	0.0	9.9	4.9	5.0	8.5	3.1	18.4	18.4	8.8	4.6	22.6
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	194	0	315	150	278	235	93	632	624	257	838	710
V/C Ratio(X)	0.79	0.00	0.78	0.78	0.48	0.78	0.77	0.76	0.76	0.82	0.22	0.78
Avail Cap(c_a), veh/h	421	0	559	314	461	391	246	1009	996	500	1328	1126
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	30.0	34.1	29.6	31.1	35.6	21.5	21.5	31.5	12.7	17.6
Incr Delay (d2), s/veh	7.0	0.0	4.3	8.4	1.3	5.5	12.8	2.0	2.0	6.3	0.1	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	4.5	2.4	2.3	3.5	1.6	7.5	7.4	4.1	1.8	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	0.0	34.3	42.4	30.9	36.6	48.4	23.5	23.5	37.8	12.8	19.5
LnGrp LOS	D	A	C	D	C	D	D	C	C	D	B	B
Approach Vol, veh/h		400			433			1033			946	
Approach Delay, s/veh		36.5			36.4			25.3			22.3	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	31.8	11.0	17.7	8.5	38.8	12.8	15.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	43.5	13.5	23.5	10.6	54.4	18.1	18.9
Max Q Clear Time (g_c+I1), s	10.8	20.4	6.9	11.9	5.1	24.6	8.4	10.5
Green Ext Time (p_c), s	0.4	6.8	0.1	1.0	0.1	3.4	0.3	0.9

Intersection Summary	
HCM 6th Ctrl Delay	27.6
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	427	1142	1025	89	1715	292
v/c Ratio	0.32	0.96	0.55	0.10	0.92	0.19
Control Delay	29.1	52.4	22.0	3.2	37.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	52.4	22.0	3.2	37.6	0.3
Queue Length 50th (ft)	137	515	310	0	717	0
Queue Length 95th (ft)	179	#689	372	26	842	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1416	1240	1987	927	1987	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.92	0.52	0.10	0.86	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	393	0	1051	0	943	82	0	1578	269
Future Volume (veh/h)	0	0	0	393	0	1051	0	943	82	0	1578	269
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				427	0	1142	0	1025	89	0	1715	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1394	0	1125	0	1860	830	0	1860	
Arrive On Green				0.41	0.00	0.41	0.00	0.53	0.53	0.00	0.53	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				427	0	1142	0	1025	89	0	1715	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				11.5	0.0	55.5	0.0	26.4	3.9	0.0	61.1	0.0
Cycle Q Clear(g_c), s				11.5	0.0	55.5	0.0	26.4	3.9	0.0	61.1	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1394	0	1125	0	1860	830	0	1860	
V/C Ratio(X)				0.31	0.00	1.02	0.00	0.55	0.11	0.00	0.92	
Avail Cap(c_a), veh/h				1394	0	1125	0	1950	870	0	1950	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				27.5	0.0	40.5	0.0	21.5	16.1	0.0	29.7	0.0
Incr Delay (d2), s/veh				0.1	0.0	30.6	0.0	0.3	0.1	0.0	7.6	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.7	0.0	23.0	0.0	10.6	1.4	0.0	26.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.6	0.0	71.1	0.0	21.8	16.2	0.0	37.3	0.0
LnGrp LOS				C	A	F	A	C	B	A	D	
Approach Vol, veh/h					1569			1114			1715	
Approach Delay, s/veh					59.3			21.3			37.3	
Approach LOS					E			C			D	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		76.5				76.5		60.0
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		75.5				75.5		55.5
Max Q Clear Time (g_c+I1), s		28.4				63.1		57.5
Green Ext Time (p_c), s		9.1				8.9		0.0

Intersection Summary	
HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	341	836	1290	190	855	1241	362	65	79	272
v/c Ratio	0.75	0.93	0.82	0.92	0.71	0.94	0.50	0.43	0.46	0.60
Control Delay	56.7	57.6	5.0	93.6	41.7	47.7	18.9	56.2	56.0	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	57.6	5.0	93.6	41.7	47.7	18.9	56.2	56.0	27.8
Queue Length 50th (ft)	119	305	0	135	204	435	120	44	54	105
Queue Length 95th (ft)	#176	#456	0	#286	264	#619	219	89	102	190
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	488	899	1568	207	1207	1316	748	294	349	471
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.93	0.82	0.92	0.71	0.94	0.48	0.22	0.23	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	769	1187	175	714	73	1142	88	245	60	73	250
Future Volume (veh/h)	314	769	1187	175	714	73	1142	88	245	60	73	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	341	836	0	190	776	79	1241	96	0	65	79	272
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	398	810		187	1027	104	1189	854		95	310	445
Arrive On Green	0.12	0.23	0.00	0.11	0.22	0.22	0.35	0.46	0.00	0.05	0.17	0.17
Sat Flow, veh/h	3428	3526	1572	1767	4674	473	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	341	836	0	190	559	296	1241	96	0	65	79	272
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1767	1689	1770	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	11.7	27.5	0.0	12.7	18.5	18.7	41.5	3.5	0.0	4.3	4.4	17.9
Cycle Q Clear(g_c), s	11.7	27.5	0.0	12.7	18.5	18.7	41.5	3.5	0.0	4.3	4.4	17.9
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	398	810		187	742	389	1189	854		95	310	445
V/C Ratio(X)	0.86	1.03		1.01	0.75	0.76	1.04	0.11		0.69	0.25	0.61
Avail Cap(c_a), veh/h	441	810		187	742	389	1189	854		266	315	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	46.1	0.0	53.5	43.7	43.8	39.1	18.4	0.0	55.7	43.4	37.2
Incr Delay (d2), s/veh	14.2	40.2	0.0	69.2	4.4	8.5	38.4	0.1	0.0	8.5	0.4	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	16.2	0.0	9.1	8.0	8.9	23.5	1.5	0.0	2.2	2.1	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.1	86.3	0.0	122.7	48.1	52.2	77.5	18.4	0.0	64.1	43.8	39.6
LnGrp LOS	E	F		F	D	D	F	B		E	D	D
Approach Vol, veh/h		1177			1045			1337			416	
Approach Delay, s/veh		80.4			62.8			73.2			44.2	
Approach LOS		F			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	59.6	17.2	32.0	46.0	24.5	18.4	30.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	43.8	12.7	27.5	41.5	20.3	15.4	24.8
Max Q Clear Time (g_c+I1), s	6.3	5.5	14.7	29.5	43.5	19.9	13.7	20.7
Green Ext Time (p_c), s	0.1	0.5	0.0	0.0	0.0	0.1	0.2	1.9

Intersection Summary	
HCM 6th Ctrl Delay	69.6
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	341	836	1290	190	855	1241	362	65	79	272
v/c Ratio	0.79	0.87	0.82	0.76	0.77	0.89	0.48	0.42	0.45	0.61
Control Delay	61.0	48.9	5.0	69.9	44.7	39.2	16.7	56.3	56.1	29.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.0	48.9	5.0	69.9	44.7	39.2	16.7	56.3	56.1	29.2
Queue Length 50th (ft)	124	302	0	70	209	415	111	45	54	110
Queue Length 95th (ft)	#206	#437	0	#135	271	#583	205	89	104	197
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	440	996	1568	251	1145	1486	811	302	340	449
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.84	0.82	0.76	0.75	0.84	0.45	0.22	0.23	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	769	1187	175	714	73	1142	88	245	60	73	250
Future Volume (veh/h)	314	769	1187	175	714	73	1142	88	245	60	73	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	341	836	0	190	776	79	1241	96	0	65	79	272
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	387	873		221	931	94	1291	897		95	298	430
Arrive On Green	0.11	0.25	0.00	0.06	0.20	0.20	0.38	0.48	0.00	0.05	0.16	0.16
Sat Flow, veh/h	3428	3526	1572	3428	4674	473	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	341	836	0	190	559	296	1241	96	0	65	79	272
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1689	1770	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	11.7	27.9	0.0	6.6	19.0	19.2	42.3	3.4	0.0	4.3	4.5	18.2
Cycle Q Clear(g_c), s	11.7	27.9	0.0	6.6	19.0	19.2	42.3	3.4	0.0	4.3	4.5	18.2
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	387	873		221	673	353	1291	897		95	298	430
V/C Ratio(X)	0.88	0.96		0.86	0.83	0.84	0.96	0.11		0.69	0.26	0.63
Avail Cap(c_a), veh/h	387	873		221	673	353	1305	897		266	298	430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	44.3	0.0	55.4	45.9	46.0	36.4	16.8	0.0	55.6	44.0	38.1
Incr Delay (d2), s/veh	20.2	20.7	0.0	27.3	8.7	16.2	16.4	0.1	0.0	8.5	0.5	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	14.4	0.0	3.6	8.6	9.8	20.3	1.5	0.0	2.1	2.1	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.4	65.1	0.0	82.7	54.7	62.2	52.8	16.9	0.0	64.0	44.4	41.1
LnGrp LOS	E	E		F	D	E	D	B		E	D	D
Approach Vol, veh/h		1177			1045			1337			416	
Approach Delay, s/veh		67.2			61.9			50.2			45.3	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	62.3	12.2	34.1	49.5	23.7	18.0	28.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	46.7	7.7	29.6	45.5	19.2	13.5	23.8
Max Q Clear Time (g_c+I1), s	6.3	5.4	8.6	29.9	44.3	20.2	13.7	21.2
Green Ext Time (p_c), s	0.1	0.5	0.0	0.0	0.7	0.0	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	57.8
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	341	836	1290	190	855	1241	362	65	79	272
v/c Ratio	0.66	0.78	0.82	0.54	0.66	0.78	0.58	0.38	0.42	0.55
Control Delay	48.3	37.6	5.0	51.7	35.9	34.8	23.3	52.9	52.5	24.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	37.6	5.0	51.7	35.9	34.8	23.3	52.9	52.5	24.6
Queue Length 50th (ft)	111	266	0	63	186	262	130	42	51	96
Queue Length 95th (ft)	175	370	0	109	252	349	246	89	103	189
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	616	1367	1568	392	1618	1982	756	346	395	534
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.61	0.82	0.48	0.53	0.63	0.48	0.19	0.20	0.51

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	769	1187	175	714	73	1142	88	245	60	73	250
Future Volume (veh/h)	314	769	1187	175	714	73	1142	88	245	60	73	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	341	836	0	190	776	79	1241	96	0	65	79	272
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	417	996		258	1103	112	1465	758		100	318	461
Arrive On Green	0.12	0.28	0.00	0.08	0.24	0.24	0.29	0.41	0.00	0.06	0.17	0.17
Sat Flow, veh/h	3428	3526	1572	3428	4674	473	4983	1856	0	1767	1856	1572
Grp Volume(v), veh/h	341	836	0	190	559	296	1241	96	0	65	79	272
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1689	1770	1661	1856	0	1767	1856	1572
Q Serve(g_s), s	9.8	22.6	0.0	5.5	15.4	15.5	23.8	3.3	0.0	3.7	3.7	15.0
Cycle Q Clear(g_c), s	9.8	22.6	0.0	5.5	15.4	15.5	23.8	3.3	0.0	3.7	3.7	15.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	417	996		258	797	418	1465	758		100	318	461
V/C Ratio(X)	0.82	0.84		0.74	0.70	0.71	0.85	0.13		0.65	0.25	0.59
Avail Cap(c_a), veh/h	557	1233		355	981	514	1791	758		313	356	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	34.3	0.0	46.0	35.5	35.6	33.7	18.7	0.0	46.9	36.4	30.7
Incr Delay (d2), s/veh	6.9	4.4	0.0	5.1	1.7	3.4	3.4	0.1	0.0	6.9	0.4	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	9.9	0.0	2.5	6.3	6.8	9.8	1.4	0.0	1.8	1.7	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.4	38.7	0.0	51.1	37.2	39.0	37.1	18.8	0.0	53.8	36.8	32.3
LnGrp LOS	D	D		D	D	D	D	B		D	D	C
Approach Vol, veh/h		1177			1045			1337			416	
Approach Delay, s/veh		42.1			40.2			35.8			36.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	46.0	12.1	33.2	34.3	21.9	16.9	28.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	38.0	10.5	35.5	36.5	19.5	16.5	29.5
Max Q Clear Time (g_c+I1), s	5.7	5.3	7.5	24.6	25.8	17.0	11.8	17.5
Green Ext Time (p_c), s	0.1	0.5	0.2	4.0	4.1	0.4	0.5	4.1

Intersection Summary	
HCM 6th Ctrl Delay	38.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	521	769	1155	188	836	1306	454	65	78	268
v/c Ratio	1.18	0.75	0.74	0.84	1.00	1.11	0.71	0.43	0.46	0.42
Control Delay	137.9	41.4	3.1	79.2	76.6	97.6	32.4	57.0	56.5	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.9	41.4	3.1	79.2	76.6	97.6	32.4	57.0	56.5	18.1
Queue Length 50th (ft)	~452	264	0	133	~227	~560	228	45	54	87
Queue Length 95th (ft)	#695	355	0	#274	#335	#734	370	90	102	156
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	443	1023	1568	224	835	1174	646	290	323	631
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.75	0.74	0.84	1.00	1.11	0.70	0.22	0.24	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	521	769	1155	188	714	122	1306	149	305	65	78	268
Future Volume (veh/h)	521	769	1155	188	714	122	1306	149	305	65	78	268
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	521	769	0	188	714	122	1306	149	0	65	78	268
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	411	941		208	663	112	1086	760		95	272	596
Arrive On Green	0.23	0.27	0.00	0.12	0.15	0.15	0.32	0.41	0.00	0.05	0.15	0.15
Sat Flow, veh/h	1767	3526	1572	1767	4362	738	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	521	769	0	188	551	285	1306	149	0	65	78	268
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1723	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	27.5	24.2	0.0	12.4	18.0	18.0	37.5	6.1	0.0	4.3	4.4	15.1
Cycle Q Clear(g_c), s	27.5	24.2	0.0	12.4	18.0	18.0	37.5	6.1	0.0	4.3	4.4	15.1
Prop In Lane	1.00		1.00	1.00		0.43	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	411	941		208	514	262	1086	760		95	272	596
V/C Ratio(X)	1.27	0.82		0.91	1.07	1.09	1.20	0.20		0.68	0.29	0.45
Avail Cap(c_a), veh/h	411	941		208	514	262	1086	760		269	298	618
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.4	40.7	0.0	51.6	50.2	50.2	40.4	22.4	0.0	55.0	45.0	27.5
Incr Delay (d2), s/veh	139.1	5.7	0.0	37.7	60.8	80.9	100.1	0.1	0.0	8.4	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.6	11.0	0.0	7.6	11.8	13.5	30.7	2.7	0.0	2.1	2.1	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	184.5	46.4	0.0	89.3	111.0	131.1	140.5	22.5	0.0	63.4	45.5	28.0
LnGrp LOS	F	D		F	F	F	F	C		E	D	C
Approach Vol, veh/h		1290			1024			1455			411	
Approach Delay, s/veh		102.2			112.6			128.5			37.0	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	53.0	18.4	36.1	42.0	21.9	32.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	38.5	13.9	31.6	37.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	6.3	8.1	14.4	26.2	39.5	17.1	29.5	20.0
Green Ext Time (p_c), s	0.1	0.8	0.0	2.3	0.0	0.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	107.5
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	72	904	349	39	882	187	40	2	2
v/c Ratio	0.26	0.48	0.35	0.16	0.59	0.31	0.07	0.01	0.01
Control Delay	28.0	10.6	2.7	29.0	15.1	25.4	0.3	31.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	10.6	2.7	29.0	15.1	25.4	0.3	31.5	0.0
Queue Length 50th (ft)	20	52	0	11	104	25	0	1	0
Queue Length 95th (ft)	75	234	44	49	243	77	0	8	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	531	3242	1477	348	3141	1102	1083	238	800
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.28	0.24	0.11	0.28	0.17	0.04	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	832	321	36	811	0	172	0	37	2	0	2
Future Volume (veh/h)	66	832	321	36	811	0	172	0	37	2	0	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	72	904	0	39	882	0	187	0	40	2	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	116	1477		75	1397	0	339	265	225	5	0	74
Arrive On Green	0.07	0.42	0.00	0.04	0.40	0.00	0.10	0.00	0.14	0.00	0.00	0.05
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	72	904	0	39	882	0	187	0	40	2	0	2
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.8	9.2	0.0	1.0	9.2	0.0	2.4	0.0	1.0	0.1	0.0	0.1
Cycle Q Clear(g_c), s	1.8	9.2	0.0	1.0	9.2	0.0	2.4	0.0	1.0	0.1	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	116	1477		75	1397	0	339	265	225	5	0	74
V/C Ratio(X)	0.62	0.61		0.52	0.63	0.00	0.55	0.00	0.18	0.41	0.00	0.03
Avail Cap(c_a), veh/h	559	4344		366	3960	0	1159	1194	1012	251	0	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.9	10.4	0.0	21.5	11.1	0.0	19.7	0.0	17.3	22.8	0.0	20.9
Incr Delay (d2), s/veh	5.4	0.4	0.0	5.4	0.5	0.0	1.4	0.0	0.4	47.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.5	0.0	0.5	2.6	0.0	0.9	0.0	0.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	10.8	0.0	26.9	11.6	0.0	21.1	0.0	17.7	70.6	0.0	21.0
LnGrp LOS	C	B		C	B	A	C	A	B	E	A	C
Approach Vol, veh/h		976			921			227			4	
Approach Delay, s/veh		12.0			12.3			20.5			45.8	
Approach LOS		B			B			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	11.1	6.5	23.7	9.0	6.6	7.5	22.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	29.5	9.5	56.5	15.5	20.5	14.5	51.5
Max Q Clear Time (g_c+I1), s	2.1	3.0	3.0	11.2	4.4	2.1	3.8	11.2
Green Ext Time (p_c), s	0.0	0.1	0.0	7.3	0.4	0.0	0.1	6.9

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	622	245	33	723	159	22
v/c Ratio	0.33	0.26	0.09	0.33	0.18	0.05
Control Delay	8.8	2.7	17.7	4.8	15.3	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	2.7	17.7	4.8	15.3	9.2
Queue Length 50th (ft)	29	0	4	35	10	0
Queue Length 95th (ft)	106	33	29	64	43	15
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3505	1568	1213	3505	2761	1277
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.16	0.03	0.21	0.06	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	572	225	30	665	146	20
Future Volume (veh/h)	572	225	30	665	146	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	622	245	33	723	159	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1243	554	253	2201	406	186
Arrive On Green	0.35	0.35	0.14	0.62	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	622	245	33	723	159	22
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	4.8	4.2	0.6	3.4	1.5	0.4
Cycle Q Clear(g_c), s	4.8	4.2	0.6	3.4	1.5	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1243	554	253	2201	406	186
V/C Ratio(X)	0.50	0.44	0.13	0.33	0.39	0.12
Avail Cap(c_a), veh/h	5597	2496	1137	8319	2795	1282
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	8.7	13.1	3.1	14.2	13.8
Incr Delay (d2), s/veh	0.3	0.6	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.9	0.2	0.2	0.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.2	13.3	3.2	14.9	14.1
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	867			756	181	
Approach Delay, s/veh	9.2			3.6	14.8	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.6	9.5	16.8				26.3
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		28.5	22.5	55.5				82.5
Max Q Clear Time (g_c+I1), s		3.5	2.6	6.8				5.4
Green Ext Time (p_c), s		0.6	0.0	5.5				5.5

Intersection Summary			
HCM 6th Ctrl Delay			7.4
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	1484	202	1173	39	29	174	195	99
v/c Ratio	0.53	0.88	0.75	0.59	0.04	0.10	0.35	0.84	0.22
Control Delay	61.5	33.6	64.2	18.9	2.2	34.6	9.0	70.8	10.3
Queue Delay	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	34.6	64.2	18.9	2.2	34.6	9.0	70.8	10.3
Queue Length 50th (ft)	65	512	145	302	0	17	8	139	6
Queue Length 95th (ft)	122	#678	#258	411	12	42	64	#255	49
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	216	1868	315	2082	954	384	595	300	547
Starvation Cap Reductn	0	171	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.87	0.64	0.56	0.04	0.08	0.29	0.65	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1328	38	186	1079	36	27	13	147	179	9	82
Future Volume (veh/h)	83	1328	38	186	1079	36	27	13	147	179	9	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	1443	41	202	1173	39	29	14	160	195	10	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	115	1650	47	234	1900	847	353	35	396	285	44	388
Arrive On Green	0.06	0.47	0.47	0.13	0.54	0.54	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1767	3501	99	1767	3526	1572	1286	128	1464	1201	161	1436
Grp Volume(v), veh/h	90	726	758	202	1173	39	29	0	174	195	0	99
Grp Sat Flow(s),veh/h/ln	1767	1763	1838	1767	1763	1572	1286	0	1592	1201	0	1597
Q Serve(g_s), s	5.4	39.7	39.9	12.0	24.7	1.3	1.9	0.0	9.6	17.0	0.0	5.2
Cycle Q Clear(g_c), s	5.4	39.7	39.9	12.0	24.7	1.3	7.1	0.0	9.6	26.6	0.0	5.2
Prop In Lane	1.00		0.05	1.00		1.00	1.00		0.92	1.00		0.90
Lane Grp Cap(c), veh/h	115	831	866	234	1900	847	353	0	431	285	0	432
V/C Ratio(X)	0.79	0.87	0.88	0.86	0.62	0.05	0.08	0.00	0.40	0.69	0.00	0.23
Avail Cap(c_a), veh/h	213	919	958	310	2031	906	386	0	472	316	0	473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.4	25.5	25.5	45.6	17.1	11.7	33.2	0.0	32.0	42.9	0.0	30.4
Incr Delay (d2), s/veh	11.2	8.7	8.6	17.2	0.5	0.0	0.1	0.0	0.6	5.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	17.9	18.7	6.4	9.7	0.4	0.6	0.0	3.8	5.4	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	34.2	34.1	62.8	17.6	11.7	33.3	0.0	32.7	48.3	0.0	30.7
LnGrp LOS	E	C	C	E	B	B	C	A	C	D	A	C
Approach Vol, veh/h		1574			1414			203			294	
Approach Delay, s/veh		35.7			23.9			32.7			42.3	
Approach LOS		D			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.5	18.7	55.0		33.5	11.5	62.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		31.8	18.8	55.9		31.8	12.9	61.8				
Max Q Clear Time (g_c+I1), s		11.6	14.0	41.9		28.6	7.4	26.7				
Green Ext Time (p_c), s		1.1	0.2	8.7		0.4	0.1	11.3				

Intersection Summary			
HCM 6th Ctrl Delay			31.3
HCM 6th LOS			C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	80	1202	352	820	102	46	263	107	43	51
v/c Ratio	0.49	0.89	0.84	0.43	0.53	0.29	0.70	0.54	0.21	0.17
Control Delay	56.2	40.4	57.6	16.0	54.5	49.3	16.3	54.4	46.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	40.4	57.6	16.0	54.5	49.3	16.3	54.4	46.6	1.2
Queue Length 50th (ft)	50	375	217	157	64	29	0	67	27	0
Queue Length 95th (ft)	108	#628	#441	277	126	66	77	130	63	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	206	1344	422	1907	307	354	513	307	354	411
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.89	0.83	0.43	0.33	0.13	0.51	0.35	0.12	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	1030	75	324	627	127	94	42	242	98	40	47
Future Volume (veh/h)	74	1030	75	324	627	127	94	42	242	98	40	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	80	1120	82	352	682	138	102	46	263	107	43	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	102	1194	87	381	1507	305	135	337	285	140	342	290
Arrive On Green	0.06	0.36	0.36	0.22	0.52	0.52	0.08	0.18	0.18	0.08	0.18	0.18
Sat Flow, veh/h	1767	3331	244	1767	2921	591	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	80	592	610	352	411	409	102	46	263	107	43	51
Grp Sat Flow(s),veh/h/ln	1767	1763	1812	1767	1763	1749	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	4.9	35.3	35.3	21.2	16.0	16.0	6.1	2.3	17.9	6.4	2.1	3.0
Cycle Q Clear(g_c), s	4.9	35.3	35.3	21.2	16.0	16.0	6.1	2.3	17.9	6.4	2.1	3.0
Prop In Lane	1.00		0.13	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	102	632	649	381	909	902	135	337	285	140	342	290
V/C Ratio(X)	0.78	0.94	0.94	0.92	0.45	0.45	0.76	0.14	0.92	0.76	0.13	0.18
Avail Cap(c_a), veh/h	197	643	661	402	909	902	293	337	285	293	342	290
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	33.7	33.7	41.7	16.6	16.6	49.2	37.3	43.7	49.0	37.0	37.3
Incr Delay (d2), s/veh	12.1	21.4	21.2	26.4	0.4	0.4	8.3	0.2	33.5	8.4	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	18.4	18.9	11.9	6.4	6.3	3.0	1.0	9.5	3.2	1.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.5	55.0	54.9	68.1	17.0	17.0	57.5	37.5	77.2	57.4	37.2	37.6
LnGrp LOS	E	E	D	E	B	B	E	D	E	E	D	D
Approach Vol, veh/h		1282			1172			411			201	
Approach Delay, s/veh		55.4			32.3			67.9			48.0	
Approach LOS		E			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	24.2	27.9	43.4	12.8	24.5	10.8	60.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	19.7	24.7	39.6	18.0	19.7	12.1	52.2
Max Q Clear Time (g_c+I1), s	8.4	19.9	23.2	37.3	8.1	5.0	6.9	18.0
Green Ext Time (p_c), s	0.2	0.0	0.2	1.6	0.1	0.2	0.1	6.1

Intersection Summary		
HCM 6th Ctrl Delay		47.8
HCM 6th LOS		D

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	668	42	1735	86	853
v/c Ratio	0.85	0.12	0.86	0.60	0.36
Control Delay	53.2	11.8	24.9	70.7	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	53.2	11.8	24.9	70.7	7.7
Queue Length 50th (ft)	256	0	556	66	125
Queue Length 95th (ft)	#349	32	681	#133	156
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	872	396	2194	158	2669
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.77	0.11	0.79	0.54	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	610	43	1158	438	79	785
Future Volume (veh/h)	610	43	1158	438	79	785
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	663	47	1259	476	86	853
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	763	340	1501	546	109	2460
Arrive On Green	0.22	0.22	0.59	0.59	0.06	0.70
Sat Flow, veh/h	3534	1572	2625	921	1767	3618
Grp Volume(v), veh/h	663	47	861	874	86	853
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1690	1767	1763
Q Serve(g_s), s	18.9	2.5	40.6	45.5	5.0	10.1
Cycle Q Clear(g_c), s	18.9	2.5	40.6	45.5	5.0	10.1
Prop In Lane	1.00	1.00		0.54	1.00	
Lane Grp Cap(c), veh/h	763	340	1045	1002	109	2460
V/C Ratio(X)	0.87	0.14	0.82	0.87	0.79	0.35
Avail Cap(c_a), veh/h	932	415	1171	1123	164	2823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	33.0	16.9	17.9	48.2	6.3
Incr Delay (d2), s/veh	7.6	0.2	4.5	7.1	13.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	1.0	16.3	18.1	2.6	3.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.0	33.2	21.4	25.0	61.6	6.4
LnGrp LOS	D	C	C	C	E	A
Approach Vol, veh/h	710		1735			939
Approach Delay, s/veh	46.1		23.2			11.4
Approach LOS	D		C			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.0	66.3				77.3		27.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	9.7	69.3				83.5		27.5
Max Q Clear Time (g_c+I1), s	7.0	47.5				12.1		20.9
Green Ext Time (p_c), s	0.0	14.3				7.6		1.6

Intersection Summary		
HCM 6th Ctrl Delay		24.8
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	207	232	553	399	182
v/c Ratio	0.48	0.12	0.57	0.49	0.38
Control Delay	21.7	5.1	10.6	17.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	5.1	10.6	17.5	6.4
Queue Length 50th (ft)	49	13	30	42	0
Queue Length 95th (ft)	126	31	84	98	47
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1320	3505	2532	2440	1094
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.07	0.22	0.16	0.17

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	190	213	212	297	269	266
Future Volume (veh/h)	190	213	212	297	269	266
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	207	232	230	323	381	194
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	279	2042	555	495	735	327
Arrive On Green	0.16	0.58	0.31	0.31	0.21	0.21
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	207	232	230	323	381	194
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	4.7	1.3	4.3	7.5	4.0	4.7
Cycle Q Clear(g_c), s	4.7	1.3	4.3	7.5	4.0	4.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	279	2042	555	495	735	327
V/C Ratio(X)	0.74	0.11	0.41	0.65	0.52	0.59
Avail Cap(c_a), veh/h	1483	6377	1521	1357	2883	1283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	4.0	11.4	12.5	14.9	15.1
Incr Delay (d2), s/veh	3.9	0.0	0.5	1.5	0.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.3	1.4	2.3	1.4	4.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.9	4.0	11.9	14.0	15.4	16.8
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		439	553		575	
Approach Delay, s/veh		12.0	13.1		15.9	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				29.0		13.3	11.2	17.8
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				76.5		34.5	35.5	36.5
Max Q Clear Time (g_c+I1), s				3.3		6.7	6.7	9.5
Green Ext Time (p_c), s				1.7		2.1	0.6	3.8

Intersection Summary			
HCM 6th Ctrl Delay			13.8
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	15	435	2	23	436	162	26	352
v/c Ratio	0.24	0.05	0.69	0.01	0.11	0.70	0.08	0.14	0.49
Control Delay	35.3	26.9	9.7	39.5	22.3	25.9	8.8	37.5	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	26.9	9.7	39.5	22.3	25.9	8.8	37.5	24.9
Queue Length 50th (ft)	15	4	0	1	2	106	6	7	42
Queue Length 95th (ft)	73	26	88	9	27	335	44	43	140
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	303	991	1044	162	769	1382	3089	207	1364
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.02	0.42	0.01	0.03	0.32	0.05	0.13	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	14	400	2	7	14	401	147	2	24	232	92
Future Volume (veh/h)	51	14	400	2	7	14	401	147	2	24	232	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	55	15	435	2	8	15	436	160	2	26	252	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	83	574	486	5	153	287	500	1442	18	50	373	144
Arrive On Green	0.05	0.31	0.31	0.00	0.27	0.27	0.28	0.40	0.40	0.03	0.15	0.15
Sat Flow, veh/h	1767	1856	1572	1767	578	1083	1767	3566	45	1767	2486	960
Grp Volume(v), veh/h	55	15	435	2	0	23	436	79	83	26	177	175
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1661	1767	1763	1848	1767	1763	1683
Q Serve(g_s), s	2.2	0.4	18.6	0.1	0.0	0.7	16.6	2.0	2.0	1.0	6.7	7.0
Cycle Q Clear(g_c), s	2.2	0.4	18.6	0.1	0.0	0.7	16.6	2.0	2.0	1.0	6.7	7.0
Prop In Lane	1.00		1.00	1.00		0.65	1.00		0.02	1.00		0.57
Lane Grp Cap(c), veh/h	83	574	486	5	0	440	500	713	747	50	264	252
V/C Ratio(X)	0.67	0.03	0.89	0.42	0.00	0.05	0.87	0.11	0.11	0.52	0.67	0.70
Avail Cap(c_a), veh/h	238	777	658	128	0	591	1141	1523	1596	163	548	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	16.9	23.2	35.1	0.0	19.3	24.1	13.1	13.1	33.8	28.3	28.4
Incr Delay (d2), s/veh	8.8	0.0	11.8	48.5	0.0	0.0	4.9	0.1	0.1	8.1	2.9	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.2	8.0	0.1	0.0	0.3	7.0	0.7	0.8	0.5	2.9	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	17.0	35.0	83.6	0.0	19.3	29.0	13.2	13.2	41.9	31.2	31.9
LnGrp LOS	D	B	D	F	A	B	C	B	B	D	C	C
Approach Vol, veh/h		505			25			598			378	
Approach Delay, s/veh		35.2			24.5			24.7			32.2	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	33.0	4.7	26.3	24.4	15.1	7.8	23.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	60.9	5.1	29.5	45.5	21.9	9.5	25.1
Max Q Clear Time (g_c+I1), s	3.0	4.0	2.1	20.6	18.6	9.0	4.2	2.7
Green Ext Time (p_c), s	0.0	0.9	0.0	1.2	1.4	1.6	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	197	443	54	223	314	420	58	589
v/c Ratio	0.62	0.45	0.33	0.49	0.72	0.30	0.35	0.71
Control Delay	44.8	16.2	49.1	36.3	41.3	18.0	49.1	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.8	16.2	49.1	36.3	41.3	18.0	49.1	29.4
Queue Length 50th (ft)	96	49	27	48	151	75	29	111
Queue Length 95th (ft)	215	117	82	110	307	135	86	224
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	507	1424	204	784	725	2166	211	1211
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.31	0.26	0.28	0.43	0.19	0.27	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	192	215	50	151	54	289	314	73	53	304	238
Future Volume (veh/h)	181	192	215	50	151	54	289	314	73	53	304	238
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	197	209	0	54	164	0	314	341	0	58	330	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	259	684		94	355		395	1179		98	587	
Arrive On Green	0.15	0.19	0.00	0.05	0.10	0.00	0.22	0.33	0.00	0.06	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	197	209	0	54	164	0	314	341	0	58	330	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	5.3	2.5	0.0	1.5	2.2	0.0	8.3	3.5	0.0	1.6	4.3	0.0
Cycle Q Clear(g_c), s	5.3	2.5	0.0	1.5	2.2	0.0	8.3	3.5	0.0	1.6	4.3	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	259	684		94	355		395	1179		98	587	
V/C Ratio(X)	0.76	0.31		0.58	0.46		0.80	0.29		0.59	0.56	
Avail Cap(c_a), veh/h	831	2276		335	1288		1187	3621		346	1942	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.3	17.1	0.0	22.9	21.0	0.0	18.2	12.2	0.0	22.9	19.0	0.0
Incr Delay (d2), s/veh	4.6	0.2	0.0	5.5	0.9	0.0	3.7	0.1	0.0	5.6	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.9	0.0	0.7	0.8	0.0	3.3	1.2	0.0	0.7	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.9	17.4	0.0	28.5	22.0	0.0	21.9	12.3	0.0	28.4	19.8	0.0
LnGrp LOS	C	B		C	C		C	B		C	B	
Approach Vol, veh/h		406			218			655			388	
Approach Delay, s/veh		21.0			23.6			16.9			21.1	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	21.1	7.1	14.1	15.6	12.7	11.8	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.7	50.9	9.4	32.0	33.3	27.3	23.3	18.1
Max Q Clear Time (g_c+I1), s	3.6	5.5	3.5	4.5	10.3	6.3	7.3	4.2
Green Ext Time (p_c), s	0.0	2.4	0.0	1.3	0.9	2.0	0.5	0.7

Intersection Summary	
HCM 6th Ctrl Delay	19.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	605	332	421	246	277
v/c Ratio	0.64	0.66	0.19	0.59	0.47
Control Delay	23.3	30.5	6.1	32.2	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	30.5	6.1	32.2	6.7
Queue Length 50th (ft)	91	116	32	88	0
Queue Length 95th (ft)	206	274	73	216	62
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1722	1102	3333	912	949
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.30	0.13	0.27	0.29

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	345	212	305	387	226	255
Future Volume (veh/h)	345	212	305	387	226	255
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	375	230	332	421	246	277
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	573	346	412	2085	415	370
Arrive On Green	0.27	0.27	0.23	0.59	0.23	0.23
Sat Flow, veh/h	2205	1276	1767	3618	1767	1572
Grp Volume(v), veh/h	312	293	332	421	246	277
Grp Sat Flow(s),veh/h/ln	1763	1626	1767	1763	1767	1572
Q Serve(g_s), s	8.1	8.3	9.2	2.9	6.4	8.5
Cycle Q Clear(g_c), s	8.1	8.3	9.2	2.9	6.4	8.5
Prop In Lane		0.79	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	478	441	412	2085	415	370
V/C Ratio(X)	0.65	0.66	0.81	0.20	0.59	0.75
Avail Cap(c_a), veh/h	1106	1020	1382	5275	1143	1017
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	16.8	18.7	4.9	17.6	18.4
Incr Delay (d2), s/veh	1.5	1.7	3.7	0.0	1.4	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	2.8	3.7	0.7	2.5	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.2	18.5	22.5	5.0	19.0	21.5
LnGrp LOS	B	B	C	A	B	C
Approach Vol, veh/h	605			753	523	
Approach Delay, s/veh	18.4			12.7	20.3	
Approach LOS	B			B	C	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	16.7	16.6	18.5	35.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	33.5	40.5	32.5	77.5
Max Q Clear Time (g_c+I1), s	10.5	11.2	10.3	4.9
Green Ext Time (p_c), s	1.7	1.0	3.7	3.0

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	1040	59	636	321	152	2	10
v/c Ratio	0.16	0.74	0.30	0.37	0.69	0.23	0.01	0.02
Control Delay	47.7	23.7	45.9	15.0	34.6	1.5	22.0	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	23.7	45.9	15.0	34.6	1.5	22.0	12.8
Queue Length 50th (ft)	12	215	28	83	140	0	1	0
Queue Length 95th (ft)	48	392	86	209	295	9	7	12
Internal Link Dist (ft)		424		851		1161		269
Turn Bay Length (ft)	125		125		75			
Base Capacity (vph)	167	2202	269	2412	889	1085	765	1027
Starvation Cap Reductn	0	84	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.49	0.22	0.26	0.36	0.14	0.00	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	662	294	54	585	0	295	0	140	2	1	8
Future Volume (veh/h)	23	662	294	54	585	0	295	0	140	2	1	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	720	320	59	636	0	321	0	152	2	1	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	51	1009	448	94	1585	0	520	0	453	385	46	414
Arrive On Green	0.03	0.43	0.43	0.05	0.45	0.00	0.29	0.00	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1767	2374	1055	1767	3618	0	1394	0	1572	1225	160	1437
Grp Volume(v), veh/h	25	535	505	59	636	0	321	0	152	2	0	10
Grp Sat Flow(s),veh/h/ln	1767	1763	1666	1767	1763	0	1394	0	1572	1225	0	1597
Q Serve(g_s), s	0.8	14.5	14.5	1.9	7.0	0.0	12.4	0.0	4.4	0.1	0.0	0.3
Cycle Q Clear(g_c), s	0.8	14.5	14.5	1.9	7.0	0.0	12.6	0.0	4.4	4.5	0.0	0.3
Prop In Lane	1.00		0.63	1.00		0.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	51	749	708	94	1585	0	520	0	453	385	0	460
V/C Ratio(X)	0.49	0.71	0.71	0.63	0.40	0.00	0.62	0.00	0.34	0.01	0.00	0.02
Avail Cap(c_a), veh/h	199	1480	1399	321	3204	0	1264	0	1293	1039	0	1313
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.6	13.7	13.7	26.8	10.7	0.0	19.3	0.0	16.2	18.0	0.0	14.7
Incr Delay (d2), s/veh	7.3	1.3	1.4	6.8	0.2	0.0	1.2	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	5.0	4.7	0.9	2.3	0.0	3.8	0.0	1.5	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	15.0	15.1	33.6	10.8	0.0	20.4	0.0	16.6	18.0	0.0	14.7
LnGrp LOS	C	B	B	C	B	A	C	A	B	B	A	B
Approach Vol, veh/h		1065			695			473			12	
Approach Delay, s/veh		15.5			12.8			19.2			15.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.1	7.6	29.1		21.1	6.2	30.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		47.5	10.5	48.5		47.5	6.5	52.5				
Max Q Clear Time (g_c+I1), s		14.6	3.9	16.5		6.5	2.8	9.0				
Green Ext Time (p_c), s		2.0	0.0	8.1		0.0	0.0	4.8				

Intersection Summary			
HCM 6th Ctrl Delay			15.4
HCM 6th LOS			B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1616	1047	949	382	414	1564
v/c Ratio	1.07	0.41	1.07	0.63	0.65	0.84
Control Delay	76.0	6.4	92.4	16.2	50.6	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	47.4
Total Delay	76.0	6.4	92.4	16.2	50.6	67.8
Queue Length 50th (ft)	~712	139	~427	65	154	473
Queue Length 95th (ft)	#848	171	#558	175	208	607
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	1515	2584	890	605	637	1855
Starvation Cap Reductn	0	0	0	0	0	453
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.41	1.07	0.63	0.65	1.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	1454	942	854	344	373	1408		
Future Volume (veh/h)	1454	942	854	344	373	1408		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	1616	1047	949	382	414	1564		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	1528	2600	896	400	643	1753		
Arrive On Green	0.45	0.74	0.25	0.25	0.19	0.19		
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768		
Grp Volume(v), veh/h	1616	1047	949	382	414	1564		
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384		
Q Serve(g_s), s	53.5	13.3	30.5	28.7	13.4	22.5		
Cycle Q Clear(g_c), s	53.5	13.3	30.5	28.7	13.4	22.5		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	1528	2600	896	400	643	1753		
V/C Ratio(X)	1.06	0.40	1.06	0.96	0.64	0.89		
Avail Cap(c_a), veh/h	1528	2600	896	400	643	1753		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	33.3	5.9	44.8	44.1	45.0	18.5		
Incr Delay (d2), s/veh	39.8	0.1	47.0	33.7	4.9	7.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	29.6	4.2	18.9	26.0	6.1	37.4		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	73.1	6.0	91.7	77.7	50.0	25.9		
LnGrp LOS	F	A	F	E	D	C		
Approach Vol, veh/h		2663	1331		1978			
Approach Delay, s/veh		46.7	87.7		31.0			
Approach LOS		D	F		C			
Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				93.0		27.0	58.0	35.0
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				88.5		22.5	53.5	30.5
Max Q Clear Time (g_c+I1), s				15.3		24.5	55.5	32.5
Green Ext Time (p_c), s				9.8		0.0	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		50.6
HCM 6th LOS		D

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	114	2082	2077	276	867	137
v/c Ratio	1.01	0.75	1.22	0.36	0.65	0.21
Control Delay	156.6	28.1	138.5	25.7	40.3	15.1
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	156.6	28.1	138.6	25.7	40.3	15.1
Queue Length 50th (ft)	~59	555	~1306	165	356	40
Queue Length 95th (ft)	#128	613	#1438	238	430	89
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	113	2769	1705	763	1326	656
Starvation Cap Reductn	0	0	28	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.75	1.24	0.36	0.65	0.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	1874	1869	248	780	123
Future Volume (veh/h)	103	1874	1869	248	780	123
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	114	2082	2077	276	867	137
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	114	2786	1716	765	1337	613
Arrive On Green	0.03	0.55	0.49	0.49	0.39	0.39
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	114	2082	2077	276	867	137
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	5.0	47.1	73.0	16.4	31.0	8.7
Cycle Q Clear(g_c), s	5.0	47.1	73.0	16.4	31.0	8.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	114	2786	1716	765	1337	613
V/C Ratio(X)	1.00	0.75	1.21	0.36	0.65	0.22
Avail Cap(c_a), veh/h	114	2786	1716	765	1337	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.5	25.8	38.5	24.0	37.4	30.6
Incr Delay (d2), s/veh	83.5	1.1	100.4	0.3	2.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	18.7	54.5	6.2	13.5	9.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	156.0	26.9	138.9	24.3	39.8	31.4
LnGrp LOS	F	C	F	C	D	C
Approach Vol, veh/h		2196	2353		1004	
Approach Delay, s/veh		33.6	125.5		38.7	
Approach LOS		C	F		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		87.0		63.0	9.5	77.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		49.1		33.0	7.0	75.0
Green Ext Time (p_c), s		21.7		4.1	0.0	0.0

Intersection Summary				
HCM 6th Ctrl Delay			73.5	
HCM 6th LOS			E	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	198	563	27	102	517
v/c Ratio	0.22	0.43	0.48	0.05	0.28	0.26
Control Delay	19.0	7.0	13.7	5.8	18.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	7.0	13.7	5.8	18.7	4.4
Queue Length 50th (ft)	16	0	57	0	22	23
Queue Length 95th (ft)	51	44	110	13	63	45
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1362	1263	3412	1527	1175	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.16	0.17	0.02	0.09	0.15

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Traffic Volume (veh/h)	69	182	518	25	94	476	
Future Volume (veh/h)	69	182	518	25	94	476	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No		No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	
Adj Flow Rate, veh/h	75	198	563	27	102	517	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	3	3	3	3	3	3	
Cap, veh/h	324	289	1062	474	246	1994	
Arrive On Green	0.18	0.18	0.30	0.30	0.14	0.57	
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618	
Grp Volume(v), veh/h	75	198	563	27	102	517	
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763	
Q Serve(g_s), s	1.3	4.2	4.8	0.4	1.9	2.7	
Cycle Q Clear(g_c), s	1.3	4.2	4.8	0.4	1.9	2.7	
Prop In Lane	1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	324	289	1062	474	246	1994	
V/C Ratio(X)	0.23	0.69	0.53	0.06	0.42	0.26	
Avail Cap(c_a), veh/h	1601	1424	4667	2082	1305	7713	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	12.5	13.7	10.4	8.9	14.1	4.0	
Incr Delay (d2), s/veh	0.4	2.9	0.4	0.0	1.1	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.4	1.3	1.3	0.1	0.6	0.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	12.8	16.6	10.8	9.0	15.2	4.0	
LnGrp LOS	B	B	B	A	B	A	
Approach Vol, veh/h	273		590			619	
Approach Delay, s/veh	15.5		10.8			5.9	
Approach LOS	B		B			A	
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	9.5	15.3				24.8	11.1
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	26.5	47.5				78.5	32.5
Max Q Clear Time (g_c+I1), s	3.9	6.8				4.7	6.2
Green Ext Time (p_c), s	0.2	4.0				3.6	0.8

Intersection Summary		
HCM 6th Ctrl Delay		9.6
HCM 6th LOS		A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	153	247	117	133	183	72	985	210	183	555
v/c Ratio	0.63	0.74	0.60	0.46	0.46	0.46	0.81	0.72	0.21	0.54
Control Delay	57.1	55.0	60.6	48.4	10.6	59.7	35.9	57.3	19.4	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	55.0	60.6	48.4	10.6	59.7	35.9	57.3	19.4	3.9
Queue Length 50th (ft)	101	158	78	84	0	48	311	138	77	0
Queue Length 95th (ft)	184	268	151	159	65	103	431	239	134	61
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	326	440	243	358	452	191	1539	387	1033	1122
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.56	0.48	0.37	0.40	0.38	0.64	0.54	0.18	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	194	33	108	122	168	66	745	161	193	168	511
Future Volume (veh/h)	141	194	33	108	122	168	66	745	161	193	168	511
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	153	211	36	117	133	183	72	810	175	210	183	555
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	193	268	46	150	276	234	93	1050	227	256	847	718
Arrive On Green	0.11	0.17	0.17	0.08	0.15	0.15	0.05	0.36	0.36	0.14	0.46	0.46
Sat Flow, veh/h	1767	1545	264	1767	1856	1572	1767	2883	623	1767	1856	1572
Grp Volume(v), veh/h	153	0	247	117	133	183	72	495	490	210	183	555
Grp Sat Flow(s),veh/h/ln	1767	0	1808	1767	1856	1572	1767	1763	1743	1767	1856	1572
Q Serve(g_s), s	6.5	0.0	10.1	5.0	5.1	8.7	3.1	19.2	19.2	8.9	4.6	22.9
Cycle Q Clear(g_c), s	6.5	0.0	10.1	5.0	5.1	8.7	3.1	19.2	19.2	8.9	4.6	22.9
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	193	0	313	150	276	234	93	642	635	256	847	718
V/C Ratio(X)	0.79	0.00	0.79	0.78	0.48	0.78	0.77	0.77	0.77	0.82	0.22	0.77
Avail Cap(c_a), veh/h	413	0	549	308	453	384	242	991	980	491	1305	1106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	30.6	34.7	30.2	31.7	36.2	21.8	21.8	32.1	12.7	17.7
Incr Delay (d2), s/veh	7.1	0.0	4.4	8.4	1.3	5.6	12.8	2.0	2.0	6.4	0.1	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	4.6	2.5	2.3	3.6	1.6	7.8	7.7	4.1	1.8	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	0.0	35.0	43.1	31.5	37.3	49.0	23.8	23.8	38.5	12.8	19.5
LnGrp LOS	D	A	D	D	C	D	D	C	C	D	B	B
Approach Vol, veh/h		400			433			1057			948	
Approach Delay, s/veh		37.2			37.1			25.5			22.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.7	32.7	11.1	17.9	8.6	39.8	13.0	16.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	43.5	13.5	23.5	10.6	54.4	18.1	18.9
Max Q Clear Time (g_c+I1), s	10.9	21.2	7.0	12.1	5.1	24.9	8.5	10.7
Green Ext Time (p_c), s	0.4	7.0	0.1	1.0	0.1	3.4	0.3	0.8

Intersection Summary	
HCM 6th Ctrl Delay	27.9
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	428	1145	1025	89	1739	292
v/c Ratio	0.32	0.97	0.54	0.10	0.92	0.19
Control Delay	29.9	55.4	21.5	3.1	37.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	55.4	21.5	3.1	37.3	0.3
Queue Length 50th (ft)	139	522	304	0	725	0
Queue Length 95th (ft)	182	#697	365	26	851	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1375	1211	1990	928	1990	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.95	0.52	0.10	0.87	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	394	0	1053	0	943	82	0	1600	269
Future Volume (veh/h)	0	0	0	394	0	1053	0	943	82	0	1600	269
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				428	0	1145	0	1025	89	0	1739	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1369	0	1105	0	1886	841	0	1886	
Arrive On Green				0.40	0.00	0.40	0.00	0.53	0.53	0.00	0.53	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				428	0	1145	0	1025	89	0	1739	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				11.7	0.0	54.5	0.0	26.0	3.8	0.0	61.8	0.0
Cycle Q Clear(g_c), s				11.7	0.0	54.5	0.0	26.0	3.8	0.0	61.8	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1369	0	1105	0	1886	841	0	1886	
V/C Ratio(X)				0.31	0.00	1.04	0.00	0.54	0.11	0.00	0.92	
Avail Cap(c_a), veh/h				1369	0	1105	0	1976	881	0	1976	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				28.1	0.0	41.0	0.0	20.8	15.7	0.0	29.1	0.0
Incr Delay (d2), s/veh				0.1	0.0	36.9	0.0	0.3	0.1	0.0	7.6	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.8	0.0	23.5	0.0	10.4	1.4	0.0	26.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				28.3	0.0	77.9	0.0	21.1	15.7	0.0	36.7	0.0
LnGrp LOS				C	A	F	A	C	B	A	D	
Approach Vol, veh/h					1573			1114			1739	
Approach Delay, s/veh					64.4			20.7			36.7	
Approach LOS					E			C			D	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		77.5				77.5		59.0				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		76.5				76.5		54.5				
Max Q Clear Time (g_c+I1), s		28.0				63.8		56.5				
Green Ext Time (p_c), s		9.2				9.2		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	42.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	521	769	1155	188	836	1306	454	65	78	268
v/c Ratio	0.91	0.93	0.74	0.89	0.88	0.94	0.61	0.43	0.47	0.53
Control Delay	66.8	59.8	3.1	88.8	54.6	46.0	24.6	57.6	57.4	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	59.8	3.1	88.8	54.6	46.0	24.6	57.6	57.4	24.8
Queue Length 50th (ft)	192	288	0	136	212	465	201	45	54	101
Queue Length 95th (ft)	#309	#432	0	#285	#304	#655	330	90	103	182
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	574	831	1568	211	950	1390	742	287	303	505
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.93	0.74	0.89	0.88	0.94	0.61	0.23	0.26	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	521	769	1155	188	714	122	1306	149	305	65	78	268
Future Volume (veh/h)	521	769	1155	188	714	122	1306	149	305	65	78	268
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	521	769	0	188	714	122	1306	149	0	65	78	268
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	529	764		194	752	127	1280	872		95	278	478
Arrive On Green	0.15	0.22	0.00	0.11	0.17	0.17	0.37	0.47	0.00	0.05	0.15	0.15
Sat Flow, veh/h	3428	3526	1572	1767	4362	738	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	521	769	0	188	551	285	1306	149	0	65	78	268
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1767	1689	1723	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	18.2	26.0	0.0	12.7	19.4	19.7	44.8	5.6	0.0	4.3	4.5	17.2
Cycle Q Clear(g_c), s	18.2	26.0	0.0	12.7	19.4	19.7	44.8	5.6	0.0	4.3	4.5	17.2
Prop In Lane	1.00		1.00	1.00		0.43	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	529	764		194	583	297	1280	872		95	278	478
V/C Ratio(X)	0.99	1.01		0.97	0.95	0.96	1.02	0.17		0.69	0.28	0.56
Avail Cap(c_a), veh/h	529	764		194	583	297	1280	872		265	278	478
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.6	47.0	0.0	53.2	49.1	49.2	37.6	18.3	0.0	55.8	45.3	35.0
Incr Delay (d2), s/veh	35.4	34.2	0.0	54.9	24.6	41.0	30.4	0.1	0.0	8.5	0.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	14.7	0.0	8.5	10.0	11.6	23.8	2.4	0.0	2.2	2.1	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.0	81.2	0.0	108.1	73.7	90.2	68.0	18.4	0.0	64.3	45.8	36.5
LnGrp LOS	F	F		F	E	F	F	B		E	D	D
Approach Vol, veh/h		1290			1024			1455			411	
Approach Delay, s/veh		83.1			84.6			62.9			42.7	
Approach LOS		F			F			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	60.9	17.7	30.5	49.3	22.5	23.0	25.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	18.0	44.8	13.2	26.0	44.8	18.0	18.5	20.7				
Max Q Clear Time (g_c+I1), s	6.3	7.6	14.7	28.0	46.8	19.2	20.2	21.7				
Green Ext Time (p_c), s	0.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0				

Intersection Summary			
HCM 6th Ctrl Delay			72.5
HCM 6th LOS			E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	521	769	1155	188	836	1306	454	65	78	268
v/c Ratio	0.90	0.78	0.74	0.79	0.92	0.93	0.61	0.43	0.46	0.53
Control Delay	65.2	43.4	3.1	74.8	58.9	44.1	23.9	57.0	56.8	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.2	43.4	3.1	74.8	58.9	44.1	23.9	57.0	56.8	24.4
Queue Length 50th (ft)	190	268	0	69	212	457	197	45	54	100
Queue Length 95th (ft)	#306	358	0	#136	#312	#645	325	90	102	181
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	579	987	1568	237	912	1405	756	290	320	508
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.78	0.74	0.79	0.92	0.93	0.60	0.22	0.24	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	521	769	1155	188	714	122	1306	149	305	65	78	268
Future Volume (veh/h)	521	769	1155	188	714	122	1306	149	305	65	78	268
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	521	769	0	188	714	122	1306	149	0	65	78	268
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	529	899		217	716	121	1283	887		95	292	490
Arrive On Green	0.15	0.25	0.00	0.06	0.16	0.16	0.37	0.48	0.00	0.05	0.16	0.16
Sat Flow, veh/h	3428	3526	1572	3428	4362	738	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	521	769	0	188	551	285	1306	149	0	65	78	268
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1689	1723	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	18.2	24.9	0.0	6.5	19.6	19.7	44.9	5.5	0.0	4.3	4.4	17.0
Cycle Q Clear(g_c), s	18.2	24.9	0.0	6.5	19.6	19.7	44.9	5.5	0.0	4.3	4.4	17.0
Prop In Lane	1.00		1.00	1.00		0.43	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	529	899		217	554	283	1283	887		95	292	490
V/C Ratio(X)	0.99	0.86		0.87	0.99	1.01	1.02	0.17		0.69	0.27	0.55
Avail Cap(c_a), veh/h	529	899		217	554	283	1283	887		265	292	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.6	42.6	0.0	55.7	50.1	50.2	37.5	17.8	0.0	55.8	44.5	34.3
Incr Delay (d2), s/veh	35.4	8.1	0.0	28.7	36.6	55.4	29.8	0.1	0.0	8.5	0.5	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	11.6	0.0	3.6	10.9	12.6	23.7	2.4	0.0	2.2	2.1	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.0	50.7	0.0	84.3	86.7	105.5	67.3	17.9	0.0	64.3	44.9	35.5
LnGrp LOS	F	D		F	F	F	F	B		E	D	D
Approach Vol, veh/h		1290			1024			1455			411	
Approach Delay, s/veh		65.0			91.5			62.2			41.9	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	61.9	12.1	35.1	49.4	23.4	23.0	24.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	45.8	7.6	30.6	44.9	18.9	18.5	19.7
Max Q Clear Time (g_c+I1), s	6.3	7.5	8.5	26.9	46.9	19.0	20.2	21.7
Green Ext Time (p_c), s	0.1	0.9	0.0	1.7	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	68.3
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	521	769	1155	188	836	1306	454	65	78	268
v/c Ratio	0.76	0.67	0.74	0.59	0.77	0.81	0.74	0.40	0.42	0.48
Control Delay	48.1	34.2	3.1	56.0	43.1	37.1	33.7	54.6	53.7	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	34.2	3.1	56.0	43.1	37.1	33.7	54.6	53.7	20.4
Queue Length 50th (ft)	179	244	0	67	200	295	228	44	53	92
Queue Length 95th (ft)	253	334	0	#111	265	376	371	90	101	167
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	792	1310	1568	334	1197	1868	713	326	380	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.59	0.74	0.56	0.70	0.70	0.64	0.20	0.21	0.44

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	521	769	1155	188	714	122	1306	149	305	65	78	268
Future Volume (veh/h)	521	769	1155	188	714	122	1306	149	305	65	78	268
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	521	769	0	188	714	122	1306	149	0	65	78	268
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	600	1049		251	854	145	1499	751		98	296	526
Arrive On Green	0.17	0.30	0.00	0.07	0.20	0.20	0.30	0.40	0.00	0.06	0.16	0.16
Sat Flow, veh/h	3428	3526	1572	3428	4362	738	4983	1856	0	1767	1856	1572
Grp Volume(v), veh/h	521	769	0	188	551	285	1306	149	0	65	78	268
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1689	1723	1661	1856	0	1767	1856	1572
Q Serve(g_s), s	15.8	20.9	0.0	5.7	16.7	17.0	26.5	5.5	0.0	3.8	3.9	14.6
Cycle Q Clear(g_c), s	15.8	20.9	0.0	5.7	16.7	17.0	26.5	5.5	0.0	3.8	3.9	14.6
Prop In Lane	1.00		1.00	1.00		0.43	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	600	1049		251	662	337	1499	751		98	296	526
V/C Ratio(X)	0.87	0.73		0.75	0.83	0.84	0.87	0.20		0.66	0.26	0.51
Avail Cap(c_a), veh/h	723	1193		305	731	373	1705	751		298	346	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	33.7	0.0	48.5	41.2	41.3	35.3	20.5	0.0	49.4	39.3	28.5
Incr Delay (d2), s/veh	9.6	2.0	0.0	8.0	7.6	15.0	4.8	0.1	0.0	7.4	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	8.9	0.0	2.7	7.4	8.4	11.2	2.4	0.0	1.9	1.8	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.4	35.7	0.0	56.5	48.8	56.3	40.1	20.7	0.0	56.8	39.8	29.2
LnGrp LOS	D	D		E	D	E	D	C		E	D	C
Approach Vol, veh/h		1290			1024			1455			411	
Approach Delay, s/veh		42.5			52.3			38.1			35.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	47.7	12.3	36.3	36.6	21.5	23.2	25.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	38.4	9.5	36.1	36.5	19.9	22.5	23.1
Max Q Clear Time (g_c+I1), s	5.8	7.5	7.7	22.9	28.5	16.6	17.8	19.0
Green Ext Time (p_c), s	0.1	0.8	0.1	4.1	3.6	0.4	0.9	1.9

Intersection Summary			
HCM 6th Ctrl Delay			42.7
HCM 6th LOS			D

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	194	803	623	112	937	419	151	25	32	109
v/c Ratio	0.56	0.56	0.40	0.43	0.61	0.58	0.33	0.15	0.17	0.21
Control Delay	37.7	22.7	0.8	40.3	25.7	33.1	19.1	42.4	41.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	22.7	0.8	40.3	25.7	33.1	19.1	42.4	41.9	7.8
Queue Length 50th (ft)	88	174	0	52	145	97	27	12	15	5
Queue Length 95th (ft)	189	297	0	125	242	182	104	43	50	43
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	629	2082	1568	424	2387	1222	694	475	554	747
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.39	0.40	0.26	0.39	0.34	0.22	0.05	0.06	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	803	623	112	893	44	419	54	97	25	32	109
Future Volume (vph)	194	803	623	112	893	44	419	54	97	25	32	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	5000		3400	1667		1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	5000		3400	1667		1752	1845	1568
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	803	623	112	893	44	419	54	97	25	32	109
RTOR Reduction (vph)	0	0	0	0	4	0	0	53	0	0	0	71
Lane Group Flow (vph)	194	803	623	112	933	0	419	98	0	25	32	38
Turn Type	Prot	NA	Free	Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases			Free									6
Actuated Green, G (s)	15.0	30.5	78.4	9.0	24.5		15.9	18.3		2.6	5.0	20.0
Effective Green, g (s)	15.0	30.5	78.4	9.0	24.5		15.9	18.3		2.6	5.0	20.0
Actuated g/C Ratio	0.19	0.39	1.00	0.11	0.31		0.20	0.23		0.03	0.06	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	335	1363	1568	201	1562		689	389		58	117	490
v/s Ratio Prot	c0.11	c0.23		0.06	0.19		c0.12	0.06		0.01	0.02	0.01
v/s Ratio Perm			c0.40									0.01
v/c Ratio	0.58	0.59	0.40	0.56	0.60		0.61	0.25		0.43	0.27	0.08
Uniform Delay, d1	28.8	19.0	0.0	32.8	22.8		28.4	24.5		37.2	35.0	22.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	0.7	0.8	3.3	0.6		1.5	0.3		5.1	1.3	0.1
Delay (s)	31.3	19.6	0.8	36.1	23.4		29.9	24.8		42.2	36.2	22.3
Level of Service	C	B	A	D	C		C	C		D	D	C
Approach Delay (s)		13.8			24.8			28.6			28.0	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	78.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	803	623	112	893	44	419	54	97	25	32	109
Future Volume (veh/h)	194	803	623	112	893	44	419	54	97	25	32	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	194	803	0	112	893	44	419	54	0	25	32	109
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	249	1227		147	1434	70	589	338		149	175	370
Arrive On Green	0.14	0.35	0.00	0.08	0.29	0.29	0.17	0.18	0.00	0.08	0.09	0.09
Sat Flow, veh/h	1767	3526	1572	1767	4946	243	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	194	803	0	112	609	328	419	54	0	25	32	109
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1812	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	6.3	11.4	0.0	3.7	9.3	9.3	6.9	1.5	0.0	0.8	0.9	3.4
Cycle Q Clear(g_c), s	6.3	11.4	0.0	3.7	9.3	9.3	6.9	1.5	0.0	0.8	0.9	3.4
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	249	1227		147	979	525	589	338		149	175	370
V/C Ratio(X)	0.78	0.65		0.76	0.62	0.62	0.71	0.16		0.17	0.18	0.29
Avail Cap(c_a), veh/h	728	2402		490	1846	990	1413	827		550	640	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	16.4	0.0	26.7	18.3	18.3	23.2	20.5	0.0	25.3	24.8	18.7
Incr Delay (d2), s/veh	5.2	0.6	0.0	7.9	0.7	1.2	1.6	0.2	0.0	0.5	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	4.0	0.0	1.7	3.2	3.5	2.7	0.6	0.0	0.3	0.4	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	17.0	0.0	34.6	18.9	19.5	24.8	20.7	0.0	25.8	25.3	19.1
LnGrp LOS	C	B		C	B	B	C	C		C	C	B
Approach Vol, veh/h		997			1049			473			166	
Approach Delay, s/veh		19.5			20.8			24.4			21.3	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	15.3	9.4	25.2	14.7	10.1	12.9	21.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	26.5	16.5	40.5	24.5	20.5	24.5	32.5
Max Q Clear Time (g_c+I1), s	2.8	3.5	5.7	13.4	8.9	5.4	8.3	11.3
Green Ext Time (p_c), s	0.0	0.2	0.2	5.7	1.4	0.4	0.4	5.9

Intersection Summary	
HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	28	607	352	23	787	324	9	2	5
v/c Ratio	0.10	0.38	0.39	0.08	0.54	0.37	0.01	0.01	0.01
Control Delay	25.7	10.2	3.1	26.0	13.4	18.9	0.0	28.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	10.2	3.1	26.0	13.4	18.9	0.0	28.0	0.0
Queue Length 50th (ft)	5	37	0	4	51	27	0	0	0
Queue Length 95th (ft)	36	158	50	32	214	109	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	375	3164	1450	375	3164	2100	1375	287	910
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.19	0.24	0.06	0.25	0.15	0.01	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	558	324	21	723	1	298	0	8	2	0	5
Future Volume (vph)	26	558	324	21	723	1	298	0	8	2	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1752	3505	1568	1752	3504		3400		1568	1752	1568	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)	1752	3505	1568	1752	3504		3400		1568	1752	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	607	352	23	786	1	324	0	9	2	0	5
RTOR Reduction (vph)	0	0	210	0	0	0	0	0	7	0	5	0
Lane Group Flow (vph)	28	607	142	23	787	0	324	0	2	2	0	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot		Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	2.2	21.1	21.1	1.0	19.9		11.7		11.6	0.7	0.6	
Effective Green, g (s)	2.2	21.1	21.1	1.0	19.9		11.7		11.6	0.7	0.6	
Actuated g/C Ratio	0.04	0.40	0.40	0.02	0.38		0.22		0.22	0.01	0.01	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	73	1411	631	33	1330		759		347	23	17	
v/s Ratio Prot	c0.02	0.17		0.01	c0.22		c0.10			0.00	0.00	
v/s Ratio Perm			0.09						c0.00			
v/c Ratio	0.38	0.43	0.22	0.70	0.59		0.43		0.01	0.09	0.00	
Uniform Delay, d1	24.4	11.3	10.3	25.5	13.0		17.5		15.9	25.5	25.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.3	0.2	0.2	48.5	0.7		0.4		0.0	1.6	0.1	
Delay (s)	27.8	11.5	10.5	74.0	13.7		17.9		15.9	27.2	25.7	
Level of Service	C	B	B	E	B		B		B	C	C	
Approach Delay (s)		11.6			15.4			17.8			26.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	558	324	21	723	1	298	0	8	2	0	5
Future Volume (veh/h)	26	558	324	21	723	1	298	0	8	2	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	607	0	23	786	1	324	0	9	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	59	1263		50	1275	2	542	326	276	5	0	32
Arrive On Green	0.03	0.36	0.00	0.03	0.35	0.35	0.16	0.00	0.18	0.00	0.00	0.02
Sat Flow, veh/h	1767	3526	1572	1767	3613	5	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	28	607	0	23	383	404	324	0	9	2	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1855	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	0.6	5.5	0.0	0.5	7.4	7.4	3.6	0.0	0.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.6	5.5	0.0	0.5	7.4	7.4	3.6	0.0	0.2	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	1263		50	622	655	542	326	276	5	0	32
V/C Ratio(X)	0.48	0.48		0.46	0.62	0.62	0.60	0.00	0.03	0.41	0.00	0.16
Avail Cap(c_a), veh/h	363	4136		363	2068	2176	2032	1728	1464	278	0	780
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.6	10.3	0.0	19.8	11.1	11.1	16.2	0.0	14.1	20.6	0.0	19.9
Incr Delay (d2), s/veh	5.9	0.3	0.0	6.6	1.0	0.9	1.1	0.0	0.0	47.6	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.5	0.0	0.3	2.2	2.3	1.3	0.0	0.1	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	10.6	0.0	26.4	12.1	12.0	17.2	0.0	14.2	68.2	0.0	22.2
LnGrp LOS	C	B		C	B	B	B	A	B	E	A	C
Approach Vol, veh/h		635			810			333			7	
Approach Delay, s/veh		11.2			12.4			17.2			35.3	
Approach LOS		B			B			B			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.6	11.8	5.7	19.3	11.0	5.3	5.9	19.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	38.5	8.5	48.5	24.5	20.5	8.5	48.5				
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.5	7.5	5.6	2.1	2.6	9.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	4.3	1.1	0.0	0.0	5.2				
Intersection Summary												
HCM 6th Ctrl Delay			13.0									
HCM 6th LOS			B									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	473	104	13	484	303	65
v/c Ratio	0.38	0.17	0.04	0.35	0.31	0.13
Control Delay	9.3	3.6	14.7	6.8	11.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	3.6	14.7	6.8	11.0	5.1
Queue Length 50th (ft)	22	0	2	23	15	0
Queue Length 95th (ft)	84	24	15	50	63	22
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3501	1566	1239	3505	3242	1498
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.07	0.01	0.14	0.09	0.04

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	435	96	12	445	279	60
Future Volume (vph)	435	96	12	445	279	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1568	1752	3505	3400	1568
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1568	1752	3505	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	473	104	13	484	303	65
RTOR Reduction (vph)	0	71	0	0	0	48
Lane Group Flow (vph)	473	33	13	484	303	17
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	11.0	11.0	0.9	16.4	9.0	9.0
Effective Green, g (s)	11.0	11.0	0.9	16.4	9.0	9.0
Actuated g/C Ratio	0.32	0.32	0.03	0.48	0.26	0.26
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1120	501	45	1670	889	410
v/s Ratio Prot	c0.13		0.01	c0.14	c0.09	
v/s Ratio Perm		0.02				0.01
v/c Ratio	0.42	0.07	0.29	0.29	0.34	0.04
Uniform Delay, d1	9.2	8.1	16.4	5.5	10.3	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	3.5	0.1	0.2	0.0
Delay (s)	9.5	8.2	20.0	5.6	10.5	9.5
Level of Service	A	A	B	A	B	A
Approach Delay (s)	9.2			5.9	10.3	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	34.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	435	96	12	445	279	60
Future Volume (veh/h)	435	96	12	445	279	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	473	104	13	484	303	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	981	438	261	1974	589	270
Arrive On Green	0.28	0.28	0.15	0.56	0.17	0.17
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	473	104	13	484	303	65
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	3.8	1.7	0.2	2.3	2.7	1.2
Cycle Q Clear(g_c), s	3.8	1.7	0.2	2.3	2.7	1.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	981	438	261	1974	589	270
V/C Ratio(X)	0.48	0.24	0.05	0.25	0.51	0.24
Avail Cap(c_a), veh/h	5096	2273	1080	7723	3832	1757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	9.4	12.3	3.8	12.6	12.0
Incr Delay (d2), s/veh	0.4	0.3	0.1	0.1	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.4	0.1	0.2	0.8	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.5	9.6	12.4	3.8	13.3	12.5
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	577			497	368	
Approach Delay, s/veh	10.3			4.1	13.2	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	10.3	9.5	13.8	23.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	37.5	20.5	48.5	73.5
Max Q Clear Time (g_c+I1), s	4.7	2.2	5.8	4.3
Green Ext Time (p_c), s	1.3	0.0	3.6	3.4

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	490	68	613	16	2	25	71	26
v/c Ratio	0.05	0.24	0.13	0.25	0.01	0.00	0.05	0.12	0.05
Control Delay	18.2	10.0	16.4	6.0	0.4	15.5	9.2	15.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	10.0	16.4	6.0	0.4	15.5	9.2	15.4	8.4
Queue Length 50th (ft)	5	46	14	29	0	0	1	14	0
Queue Length 95th (ft)	23	92	45	107	2	5	16	45	15
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	1035	3478	1223	3505	1568	1557	1354	1557	1336
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.14	0.06	0.17	0.01	0.00	0.02	0.05	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	446	5	63	564	15	2	3	20	65	1	23
Future Volume (vph)	22	446	5	63	564	15	2	3	20	65	1	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3499		1752	3505	1568	1752	1601		1752	1579	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	1752	3499		1752	3505	1568	1845	1601		1845	1579	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	485	5	68	613	16	2	3	22	71	1	25
RTOR Reduction (vph)	0	1	0	0	0	8	0	20	0	0	22	0
Lane Group Flow (vph)	24	489	0	68	613	8	2	5	0	71	4	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	0.9	15.9		3.6	18.6	18.6	3.9	3.9		3.9	3.9	
Effective Green, g (s)	0.9	15.9		3.6	18.6	18.6	3.9	3.9		3.9	3.9	
Actuated g/C Ratio	0.02	0.43		0.10	0.50	0.50	0.11	0.11		0.11	0.11	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	42	1507		170	1766	790	195	169		195	166	
v/s Ratio Prot	0.01	0.14		c0.04	c0.17			0.00			0.00	
v/s Ratio Perm						0.01	0.00			c0.04		
v/c Ratio	0.57	0.32		0.40	0.35	0.01	0.01	0.03		0.36	0.02	
Uniform Delay, d1	17.8	6.9		15.6	5.5	4.6	14.8	14.8		15.3	14.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.4	0.1		1.5	0.1	0.0	0.0	0.1		1.2	0.1	
Delay (s)	35.2	7.1		17.2	5.6	4.6	14.8	14.9		16.5	14.8	
Level of Service	D	A		B	A	A	B	B		B	B	
Approach Delay (s)		8.4			6.7			14.9			16.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	36.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	446	5	63	564	15	2	3	20	65	1	23
Future Volume (veh/h)	22	446	5	63	564	15	2	3	20	65	1	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	485	5	68	613	16	2	3	22	71	1	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1200	12	130	1335	595	387	21	156	389	7	168
Arrive On Green	0.03	0.34	0.34	0.07	0.38	0.38	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3575	37	1767	3526	1572	1374	192	1410	1375	61	1521
Grp Volume(v), veh/h	24	239	251	68	613	16	2	0	25	71	0	26
Grp Sat Flow(s),veh/h/ln	1767	1763	1849	1767	1763	1572	1374	0	1602	1375	0	1582
Q Serve(g_s), s	0.4	2.9	2.9	1.0	3.7	0.2	0.0	0.0	0.4	1.4	0.0	0.4
Cycle Q Clear(g_c), s	0.4	2.9	2.9	1.0	3.7	0.2	0.5	0.0	0.4	1.8	0.0	0.4
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	54	592	621	130	1335	595	387	0	177	389	0	175
V/C Ratio(X)	0.45	0.40	0.40	0.53	0.46	0.03	0.01	0.00	0.14	0.18	0.00	0.15
Avail Cap(c_a), veh/h	912	3169	3324	1415	7342	3275	1874	0	1910	1877	0	1886
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.4	7.2	7.2	12.5	6.6	5.5	11.5	0.0	11.3	12.1	0.0	11.3
Incr Delay (d2), s/veh	5.7	0.4	0.4	3.3	0.2	0.0	0.0	0.0	0.4	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.7	0.7	0.4	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	7.6	7.6	15.8	6.8	5.5	11.5	0.0	11.7	12.3	0.0	11.7
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		514			697			27			97	
Approach Delay, s/veh		8.1			7.7			11.6			12.2	
Approach LOS		A			A			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.6	6.6	13.9		7.6	5.4	15.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		33.5	22.5	50.5		33.5	14.5	58.5				
Max Q Clear Time (g_c+I1), s		2.5	3.0	4.9		3.8	2.4	5.7				
Green Ext Time (p_c), s		0.1	0.1	3.3		0.3	0.0	5.0				
Intersection Summary												
HCM 6th Ctrl Delay			8.3									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	327	214	409	28	23	105	58	14	20
v/c Ratio	0.17	0.40	0.46	0.23	0.11	0.09	0.31	0.20	0.04	0.05
Control Delay	26.1	20.7	22.6	12.2	26.7	27.0	6.5	25.8	23.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	20.7	22.6	12.2	26.7	27.0	6.5	25.8	23.6	0.2
Queue Length 50th (ft)	14	48	62	48	8	7	0	17	3	0
Queue Length 95th (ft)	46	99	137	93	33	29	28	54	20	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	506	1877	1194	2782	789	1066	963	830	1093	985
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.17	0.18	0.15	0.04	0.02	0.11	0.07	0.01	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	266	35	197	278	98	26	21	97	53	13	18
Future Volume (vph)	42	266	35	197	278	98	26	21	97	53	13	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3444		1752	3367		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3444		1752	3367		1752	1845	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	289	38	214	302	107	28	23	105	58	14	20
RTOR Reduction (vph)	0	8	0	0	27	0	0	0	94	0	0	17
Lane Group Flow (vph)	46	319	0	214	382	0	28	23	11	58	14	3
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	4.0	14.7		13.3	24.0		2.4	5.6	5.6	4.3	7.5	7.5
Effective Green, g (s)	4.0	14.7		13.3	24.0		2.4	5.6	5.6	4.3	7.5	7.5
Actuated g/C Ratio	0.07	0.26		0.24	0.43		0.04	0.10	0.10	0.08	0.13	0.13
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	125	905		416	1445		75	184	157	134	247	210
v/s Ratio Prot	0.03	c0.09		c0.12	0.11		0.02	c0.01		c0.03	0.01	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.37	0.35		0.51	0.26		0.37	0.12	0.07	0.43	0.06	0.01
Uniform Delay, d1	24.7	16.7		18.5	10.3		26.0	22.9	22.8	24.6	21.1	21.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.2		1.1	0.1		3.1	0.3	0.2	2.2	0.1	0.0
Delay (s)	26.6	17.0		19.6	10.4		29.1	23.2	23.0	26.9	21.2	21.0
Level of Service	C	B		B	B		C	C	C	C	C	C
Approach Delay (s)		18.2			13.5			24.1			24.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	266	35	197	278	98	26	21	97	53	13	18
Future Volume (veh/h)	42	266	35	197	278	98	26	21	97	53	13	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	289	38	214	302	107	28	23	105	58	14	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	88	551	72	288	742	258	196	245	208	160	208	176
Arrive On Green	0.05	0.18	0.18	0.16	0.29	0.29	0.11	0.13	0.13	0.09	0.11	0.11
Sat Flow, veh/h	1767	3136	408	1767	2567	891	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	46	161	166	214	205	204	28	23	105	58	14	20
Grp Sat Flow(s),veh/h/ln	1767	1763	1782	1767	1763	1695	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	1.0	3.4	3.5	4.7	3.9	4.0	0.6	0.4	2.6	1.3	0.3	0.5
Cycle Q Clear(g_c), s	1.0	3.4	3.5	4.7	3.9	4.0	0.6	0.4	2.6	1.3	0.3	0.5
Prop In Lane	1.00		0.23	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	88	309	313	288	510	490	196	245	208	160	208	176
V/C Ratio(X)	0.52	0.52	0.53	0.74	0.40	0.42	0.14	0.09	0.51	0.36	0.07	0.11
Avail Cap(c_a), veh/h	538	1009	1020	1398	1867	1795	839	1152	976	882	1197	1015
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	15.4	15.4	16.4	11.7	11.8	16.5	15.7	16.6	17.6	16.3	16.4
Incr Delay (d2), s/veh	4.8	1.4	1.4	3.8	0.5	0.6	0.3	0.2	1.9	1.4	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.3	1.3	1.9	1.3	1.3	0.2	0.2	0.9	0.5	0.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	16.7	16.8	20.1	12.3	12.4	16.8	15.8	18.5	18.9	16.5	16.7
LnGrp LOS	C	B	B	C	B	B	B	B	B	B	B	B
Approach Vol, veh/h		373			623			156			92	
Approach Delay, s/veh		17.6			15.0			17.8			18.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	9.9	11.2	11.7	9.1	9.1	6.5	16.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	32.5	23.5	19.5	26.5	12.5	43.5
Max Q Clear Time (g_c+I1), s	3.3	4.6	6.7	5.5	2.6	2.5	3.0	6.0
Green Ext Time (p_c), s	0.1	0.4	0.6	1.7	0.0	0.1	0.0	2.7

Intersection Summary	
HCM 6th Ctrl Delay	16.4
HCM 6th LOS	B

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	140	19	698	55	308
v/c Ratio	0.16	0.05	0.38	0.13	0.14
Control Delay	15.9	9.9	7.9	17.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	9.9	7.9	17.2	3.9
Queue Length 50th (ft)	9	0	27	7	13
Queue Length 95th (ft)	39	15	108	40	25
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2534	1067	3333	1042	3505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.02	0.21	0.05	0.09

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	127	19	431	212	51	283
Future Volume (vph)	127	19	431	212	51	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	0.97	0.91	0.95		1.00	0.95
Frt	1.00	0.85	0.95		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3403	1427	3332		1752	3505
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3403	1427	3332		1752	3505
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	21	468	230	55	308
RTOR Reduction (vph)	1	16	59	0	0	0
Lane Group Flow (vph)	139	3	639	0	55	308
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	5.7	5.7	16.6		2.3	23.4
Effective Green, g (s)	5.7	5.7	16.6		2.3	23.4
Actuated g/C Ratio	0.15	0.15	0.44		0.06	0.61
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	509	213	1451		105	2152
v/s Ratio Prot	c0.04		c0.19		c0.03	0.09
v/s Ratio Perm		0.00				
v/c Ratio	0.27	0.01	0.44		0.52	0.14
Uniform Delay, d1	14.4	13.8	7.5		17.4	3.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.0	0.2		4.7	0.0
Delay (s)	14.7	13.8	7.7		22.0	3.1
Level of Service	B	B	A		C	A
Approach Delay (s)	14.6		7.7			6.0
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	38.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	127	19	431	212	51	283
Future Volume (veh/h)	127	19	431	212	51	283
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	138	21	468	230	55	308
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	422	188	895	437	107	2093
Arrive On Green	0.12	0.12	0.39	0.39	0.06	0.59
Sat Flow, veh/h	3534	1572	2389	1121	1767	3618
Grp Volume(v), veh/h	138	21	359	339	55	308
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1654	1767	1763
Q Serve(g_s), s	1.1	0.4	4.9	4.9	0.9	1.2
Cycle Q Clear(g_c), s	1.1	0.4	4.9	4.9	0.9	1.2
Prop In Lane	1.00	1.00		0.68	1.00	
Lane Grp Cap(c), veh/h	422	188	687	644	107	2093
V/C Ratio(X)	0.33	0.11	0.52	0.53	0.51	0.15
Avail Cap(c_a), veh/h	2872	1278	3510	3293	1042	9604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	12.3	7.3	7.4	14.3	2.8
Incr Delay (d2), s/veh	0.4	0.3	0.6	0.7	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	1.2	1.2	0.4	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.1	12.6	8.0	8.0	18.0	2.9
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	159		698			363
Approach Delay, s/veh	13.0		8.0			5.2
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.4	16.7				23.1		8.2
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	18.5	62.5				85.5		25.5
Max Q Clear Time (g_c+I1), s	2.9	6.9				3.2		3.1
Green Ext Time (p_c), s	0.1	5.3				2.3		0.5

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	150	104	313	124	56
v/c Ratio	0.29	0.05	0.34	0.15	0.15
Control Delay	13.7	3.7	6.6	12.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	3.7	6.6	12.6	6.5
Queue Length 50th (ft)	24	3	9	9	0
Queue Length 95th (ft)	64	10	35	27	21
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1726	3505	3014	2947	1257
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.03	0.10	0.04	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	138	96	100	188	98	67
Future Volume (vph)	138	96	100	188	98	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	0.91
Frt	1.00	1.00	0.90		0.98	0.85
Flt Protected	0.95	1.00	1.00		0.96	1.00
Satd. Flow (prot)	1752	3505	3162		3360	1427
Flt Permitted	0.95	1.00	1.00		0.96	1.00
Satd. Flow (perm)	1752	3505	3162		3360	1427
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	104	109	204	107	73
RTOR Reduction (vph)	0	0	155	0	13	48
Lane Group Flow (vph)	150	104	158	0	111	8
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	6.5	19.0	8.0		5.0	5.0
Effective Green, g (s)	6.5	19.0	8.0		5.0	5.0
Actuated g/C Ratio	0.20	0.58	0.24		0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	345	2018	766		509	216
v/s Ratio Prot	c0.09	0.03	c0.05		c0.03	
v/s Ratio Perm						0.01
v/c Ratio	0.43	0.05	0.21		0.22	0.04
Uniform Delay, d1	11.6	3.1	10.0		12.3	11.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	0.0	0.1		0.2	0.1
Delay (s)	12.5	3.1	10.1		12.5	12.0
Level of Service	B	A	B		B	B
Approach Delay (s)		8.6	10.1		12.4	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	138	96	100	188	98	67
Future Volume (veh/h)	138	96	100	188	98	67
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	104	109	204	119	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	219	1893	439	392	479	213
Arrive On Green	0.12	0.54	0.25	0.25	0.14	0.14
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	150	104	109	204	119	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	2.2	0.4	1.4	3.1	0.8	0.9
Cycle Q Clear(g_c), s	2.2	0.4	1.4	3.1	0.8	0.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	219	1893	439	392	479	213
V/C Ratio(X)	0.68	0.05	0.25	0.52	0.25	0.28
Avail Cap(c_a), veh/h	2540	10201	2278	2032	4052	1803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	3.0	8.3	8.9	10.6	10.7
Incr Delay (d2), s/veh	3.7	0.0	0.3	1.1	0.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.4	0.8	0.2	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.3	3.0	8.6	10.0	10.9	11.4
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h		254	313		179	
Approach Delay, s/veh		10.3	9.5		11.1	
Approach LOS		B	A		B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	19.3	8.2	7.9	11.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	79.5	31.5	39.5	35.5
Max Q Clear Time (g_c+I1), s	2.4	2.9	4.2	5.1
Green Ext Time (p_c), s	0.7	0.6	0.4	2.1

Intersection Summary	
HCM 6th Ctrl Delay	10.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	8	140	4	33	238	280	10	367
v/c Ratio	0.11	0.02	0.34	0.02	0.13	0.47	0.12	0.04	0.42
Control Delay	25.6	21.7	8.0	27.0	15.9	20.8	7.3	26.4	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	21.7	8.0	27.0	15.9	20.8	7.3	26.4	18.9
Queue Length 50th (ft)	7	2	0	1	2	48	9	2	37
Queue Length 95th (ft)	35	14	45	10	27	149	62	17	107
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	399	1118	1005	315	932	1397	3405	315	2410
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	0.14	0.01	0.04	0.17	0.08	0.03	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	7	129	4	7	23	219	253	5	9	288	50
Future Volume (vph)	28	7	129	4	7	23	219	253	5	9	288	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568	1752	1635		1752	3495		1752	3427	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1568	1752	1635		1752	3495		1752	3427	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	8	140	4	8	25	238	275	5	10	313	54
RTOR Reduction (vph)	0	0	123	0	23	0	0	1	0	0	11	0
Lane Group Flow (vph)	30	8	17	4	10	0	238	279	0	10	356	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	2.3	6.9	6.9	0.9	5.5		13.6	29.2		0.9	16.5	
Effective Green, g (s)	2.3	6.9	6.9	0.9	5.5		13.6	29.2		0.9	16.5	
Actuated g/C Ratio	0.04	0.12	0.12	0.02	0.10		0.24	0.52		0.02	0.30	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	72	227	193	28	160		426	1825		28	1011	
v/s Ratio Prot	c0.02	0.00		0.00	0.01		c0.14	0.08		0.01	c0.10	
v/s Ratio Perm			c0.01									
v/c Ratio	0.42	0.04	0.09	0.14	0.07		0.56	0.15		0.36	0.35	
Uniform Delay, d1	26.1	21.6	21.7	27.1	22.9		18.5	6.9		27.2	15.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.9	0.1	0.2	2.3	0.2		1.6	0.0		7.7	0.2	
Delay (s)	30.0	21.6	21.9	29.5	23.0		20.1	7.0		34.9	15.7	
Level of Service	C	C	C	C	C		C	A		C	B	
Approach Delay (s)		23.3			23.7			13.0			16.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	7	129	4	7	23	219	253	5	9	288	50
Future Volume (veh/h)	28	7	129	4	7	23	219	253	5	9	288	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	30	8	140	4	8	25	238	275	5	10	313	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	63	264	224	10	44	139	321	1309	24	23	605	103
Arrive On Green	0.04	0.14	0.14	0.01	0.11	0.11	0.18	0.37	0.37	0.01	0.20	0.20
Sat Flow, veh/h	1767	1856	1572	1767	396	1237	1767	3542	64	1767	3012	514
Grp Volume(v), veh/h	30	8	140	4	0	33	238	137	143	10	182	185
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1633	1767	1763	1844	1767	1763	1763
Q Serve(g_s), s	0.6	0.1	3.2	0.1	0.0	0.7	4.9	2.0	2.0	0.2	3.5	3.6
Cycle Q Clear(g_c), s	0.6	0.1	3.2	0.1	0.0	0.7	4.9	2.0	2.0	0.2	3.5	3.6
Prop In Lane	1.00		1.00	1.00		0.76	1.00		0.03	1.00		0.29
Lane Grp Cap(c), veh/h	63	264	224	10	0	183	321	651	681	23	354	354
V/C Ratio(X)	0.48	0.03	0.62	0.42	0.00	0.18	0.74	0.21	0.21	0.43	0.51	0.52
Avail Cap(c_a), veh/h	438	1234	1046	346	0	1001	1728	2827	2958	346	1448	1448
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	14.2	15.5	19.0	0.0	15.4	14.8	8.3	8.3	18.8	13.6	13.7
Incr Delay (d2), s/veh	5.5	0.0	2.8	26.2	0.0	0.5	3.4	0.2	0.2	12.0	1.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	1.1	0.1	0.0	0.2	1.8	0.6	0.6	0.2	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	14.2	18.3	45.2	0.0	15.9	18.2	8.4	8.4	30.8	14.8	14.9
LnGrp LOS	C	B	B	D	A	B	B	A	A	C	B	B
Approach Vol, veh/h		178			37			518			377	
Approach Delay, s/veh		19.0			19.1			12.9			15.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.0	18.7	4.7	10.0	11.5	12.2	5.9	8.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	61.5	7.5	25.5	37.5	31.5	9.5	23.5
Max Q Clear Time (g_c+I1), s	2.2	4.0	2.1	5.2	6.9	5.6	2.6	2.7
Green Ext Time (p_c), s	0.0	1.7	0.0	0.4	0.7	2.1	0.0	0.1

Intersection Summary			
HCM 6th Ctrl Delay			14.9
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	165	870	141	326	527	356	196	353
v/c Ratio	0.68	0.90	0.78	0.42	0.90	0.33	0.71	0.69
Control Delay	60.0	45.7	78.0	39.0	55.1	29.0	59.1	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	45.7	78.0	39.0	55.1	29.0	59.1	42.4
Queue Length 50th (ft)	117	274	103	104	355	97	139	101
Queue Length 95th (ft)	192	#421	#223	165	#584	146	218	153
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	328	1014	187	780	660	1224	375	699
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.86	0.75	0.42	0.80	0.29	0.52	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	446	354	130	257	43	485	279	49	180	206	119
Future Volume (vph)	152	446	354	130	257	43	485	279	49	180	206	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.98		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3272		1752	3429		1752	3427		1752	3313	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	3272		1752	3429		1752	3427		1752	3313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	165	485	385	141	279	47	527	303	53	196	224	129
RTOR Reduction (vph)	0	117	0	0	11	0	0	12	0	0	71	0
Lane Group Flow (vph)	165	753	0	141	315	0	527	344	0	196	282	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.2	28.3		11.3	24.4		36.4	33.8		17.2	14.6	
Effective Green, g (s)	15.2	28.3		11.3	24.4		36.4	33.8		17.2	14.6	
Actuated g/C Ratio	0.14	0.26		0.10	0.22		0.34	0.31		0.16	0.13	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	245	852		182	770		587	1066		277	445	
v/s Ratio Prot	c0.09	c0.23		0.08	0.09		c0.30	0.10		0.11	c0.09	
v/s Ratio Perm												
v/c Ratio	0.67	0.88		0.77	0.41		0.90	0.32		0.71	0.63	
Uniform Delay, d1	44.3	38.6		47.4	35.9		34.3	28.6		43.3	44.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.1	10.8		18.4	0.4		16.4	0.2		8.0	2.9	
Delay (s)	51.5	49.4		65.8	36.3		50.7	28.8		51.3	47.4	
Level of Service	D	D		E	D		D	C		D	D	
Approach Delay (s)		49.7			45.2			41.9			48.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	446	354	130	257	43	485	279	49	180	206	119
Future Volume (veh/h)	152	446	354	130	257	43	485	279	49	180	206	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	165	485	0	141	279	0	527	303	0	196	224	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	210	702		179	640		592	1061		246	370	
Arrive On Green	0.12	0.20	0.00	0.10	0.18	0.00	0.34	0.30	0.00	0.14	0.10	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	165	485	0	141	279	0	527	303	0	196	224	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	6.3	8.9	0.0	5.4	4.9	0.0	19.6	4.6	0.0	7.4	4.2	0.0
Cycle Q Clear(g_c), s	6.3	8.9	0.0	5.4	4.9	0.0	19.6	4.6	0.0	7.4	4.2	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	210	702		179	640		592	1061		246	370	
V/C Ratio(X)	0.78	0.69		0.79	0.44		0.89	0.29		0.80	0.61	
Avail Cap(c_a), veh/h	512	1500		293	1063		1032	1932		586	1042	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.7	25.8	0.0	30.4	25.2	0.0	21.8	18.5	0.0	28.9	29.7	0.0
Incr Delay (d2), s/veh	6.3	1.2	0.0	7.5	0.5	0.0	5.2	0.1	0.0	5.8	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.6	0.0	2.5	2.0	0.0	8.1	1.7	0.0	3.4	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.0	27.0	0.0	37.9	25.7	0.0	27.0	18.7	0.0	34.7	31.3	0.0
LnGrp LOS	D	C		D	C		C	B		C	C	
Approach Vol, veh/h		650			420			830			420	
Approach Delay, s/veh		29.3			29.8			24.0			32.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	25.4	11.5	18.3	27.7	11.8	12.8	17.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.0	38.0	11.5	29.5	40.5	20.5	20.1	20.9
Max Q Clear Time (g_c+I1), s	9.4	6.6	7.4	10.9	21.6	6.2	8.3	6.9
Green Ext Time (p_c), s	0.4	2.0	0.1	3.0	1.6	1.1	0.3	1.4

Intersection Summary	
HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	743	438	493	338	537
v/c Ratio	0.77	0.81	0.22	0.73	0.66
Control Delay	36.6	44.0	8.0	44.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	44.0	8.0	44.1	7.4
Queue Length 50th (ft)	198	245	60	190	0
Queue Length 95th (ft)	335	425	104	338	91
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1237	806	2849	686	941
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.54	0.17	0.49	0.57

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	455	228	403	454	311	494
Future Volume (vph)	455	228	403	454	311	494
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	4.5
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.95		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3329		1752	3505	1752	1568
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3329		1752	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	495	248	438	493	338	537
RTOR Reduction (vph)	51	0	0	0	0	395
Lane Group Flow (vph)	692	0	438	493	338	142
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	25.9		29.2	59.6	24.7	24.7
Effective Green, g (s)	25.9		29.2	59.6	24.7	24.7
Actuated g/C Ratio	0.28		0.31	0.64	0.26	0.26
Clearance Time (s)	4.5		4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	924		548	2238	463	415
v/s Ratio Prot	c0.21		c0.25	0.14	c0.19	
v/s Ratio Perm						0.09
v/c Ratio	0.75		0.80	0.22	0.73	0.34
Uniform Delay, d1	30.7		29.4	7.1	31.3	27.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4		8.0	0.0	5.8	0.5
Delay (s)	34.1		37.4	7.1	37.1	28.2
Level of Service	C		D	A	D	C
Approach Delay (s)	34.1			21.4	31.7	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	93.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	455	228	403	454	311	494
Future Volume (veh/h)	455	228	403	454	311	494
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	495	248	438	493	338	537
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	584	291	480	2017	600	534
Arrive On Green	0.26	0.26	0.27	0.57	0.34	0.34
Sat Flow, veh/h	2371	1136	1767	3618	1767	1572
Grp Volume(v), veh/h	383	360	438	493	338	537
Grp Sat Flow(s),veh/h/ln	1763	1651	1767	1763	1767	1572
Q Serve(g_s), s	21.0	21.1	24.4	7.1	15.9	34.5
Cycle Q Clear(g_c), s	21.0	21.1	24.4	7.1	15.9	34.5
Prop In Lane		0.69	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	452	423	480	2017	600	534
V/C Ratio(X)	0.85	0.85	0.91	0.24	0.56	1.01
Avail Cap(c_a), veh/h	546	512	704	2653	600	534
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	36.0	35.9	10.8	27.4	33.6
Incr Delay (d2), s/veh	10.1	11.2	12.2	0.1	1.2	40.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	9.6	11.8	2.6	6.8	18.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.1	47.2	48.1	10.9	28.7	74.1
LnGrp LOS	D	D	D	B	C	F
Approach Vol, veh/h	743			931	875	
Approach Delay, s/veh	46.6			28.4	56.6	
Approach LOS	D			C	E	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		39.0	32.1	30.6				62.7
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		34.5	40.5	31.5				76.5
Max Q Clear Time (g_c+I1), s		36.5	26.4	23.1				9.1
Green Ext Time (p_c), s		0.0	1.2	2.9				3.6

Intersection Summary		
HCM 6th Ctrl Delay		43.4
HCM 6th LOS		D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	25	798	96	759	148	97
v/c Ratio	0.11	0.59	0.32	0.42	0.46	0.15
Control Delay	29.1	16.2	27.5	10.4	26.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	16.2	27.5	10.4	26.8	0.5
Queue Length 50th (ft)	7	104	28	53	42	0
Queue Length 95th (ft)	34	204	84	171	114	0
Internal Link Dist (ft)		424		851		1161
Turn Bay Length (ft)	125		125		75	
Base Capacity (vph)	337	3022	691	3334	947	1177
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.14	0.23	0.16	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	617	117	88	697	1	136	0	89	0	0	0
Future Volume (vph)	23	617	117	88	697	1	136	0	89	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5				
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00				
Frt	1.00	0.98		1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00				
Satd. Flow (prot)	1752	3421		1752	3504		1752	1568				
Flt Permitted	0.95	1.00		0.95	1.00		0.76	1.00				
Satd. Flow (perm)	1752	3421		1752	3504		1397	1568				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	671	127	96	758	1	148	0	97	0	0	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	75	0	0	0	0
Lane Group Flow (vph)	25	784	0	96	759	0	148	22	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	2.4	23.5		7.2	28.3		12.8	12.8				
Effective Green, g (s)	2.4	23.5		7.2	28.3		12.8	12.8				
Actuated g/C Ratio	0.04	0.41		0.13	0.50		0.22	0.22				
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5				
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)	73	1410		221	1739		313	352				
v/s Ratio Prot	0.01	c0.23		c0.05	0.22			0.01				
v/s Ratio Perm							c0.11					
v/c Ratio	0.34	0.56		0.43	0.44		0.47	0.06				
Uniform Delay, d1	26.5	12.8		23.0	9.2		19.2	17.4				
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00				
Incremental Delay, d2	2.8	0.5		1.4	0.2		1.1	0.1				
Delay (s)	29.3	13.3		24.4	9.4		20.3	17.5				
Level of Service	C	B		C	A		C	B				
Approach Delay (s)		13.7			11.1			19.2			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	617	117	88	697	1	136	0	89	0	0	0
Future Volume (veh/h)	23	617	117	88	697	1	136	0	89	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	671	127	96	758	1	148	0	97	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1161	220	151	1617	2	460	0	232	200	273	0
Arrive On Green	0.03	0.39	0.39	0.09	0.45	0.45	0.15	0.00	0.15	0.00	0.00	0.00
Sat Flow, veh/h	1767	2958	559	1767	3613	5	1767	0	1572	1288	1856	0
Grp Volume(v), veh/h	25	400	398	96	370	389	148	0	97	0	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1755	1767	1763	1855	1767	0	1572	1288	1856	0
Q Serve(g_s), s	0.5	6.4	6.4	1.9	5.3	5.3	2.8	0.0	2.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	6.4	6.4	1.9	5.3	5.3	2.8	0.0	2.0	0.0	0.0	0.0
Prop In Lane	1.00		0.32	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	54	692	689	151	789	830	460	0	232	200	273	0
V/C Ratio(X)	0.46	0.58	0.58	0.63	0.47	0.47	0.32	0.00	0.42	0.00	0.00	0.00
Avail Cap(c_a), veh/h	466	2518	2507	956	3007	3164	1940	0	1548	1278	1827	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	17.2	8.6	8.6	15.9	7.0	7.0	14.3	0.0	14.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.0	0.8	0.8	4.3	0.4	0.4	0.4	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.7	1.7	0.8	1.2	1.3	1.0	0.0	0.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	9.4	9.4	20.3	7.4	7.4	14.7	0.0	15.2	0.0	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	B	A	A	A
Approach Vol, veh/h		823			855			245			0	
Approach Delay, s/veh		9.8			8.8			14.9			0.0	
Approach LOS		A			A			B				

Timer - Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.8	7.6	18.7		9.8	5.6	20.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		35.5	19.5	51.5		35.5	9.5	61.5
Max Q Clear Time (g_c+I1), s		4.8	3.9	8.4		0.0	2.5	7.3
Green Ext Time (p_c), s		1.0	0.2	5.7		0.0	0.0	5.3

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	477	480	646	241	99	1118
v/c Ratio	0.58	0.26	0.75	0.43	0.07	0.59
Control Delay	41.9	14.9	45.6	6.6	23.0	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.3
Total Delay	41.9	14.9	45.6	6.6	23.0	13.4
Queue Length 50th (ft)	159	96	230	0	23	208
Queue Length 95th (ft)	228	127	295	60	44	321
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	826	2059	1068	645	1336	1896
Starvation Cap Reductn	0	0	0	0	0	612
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.23	0.60	0.37	0.07	0.87

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	429	432	581	217	89	1006
Future Volume (vph)	429	432	581	217	89	1006
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3400	3505	3505	1568	3400	2760
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3400	3505	3505	1568	3400	2760
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	477	480	646	241	99	1118
RTOR Reduction (vph)	0	0	0	182	0	30
Lane Group Flow (vph)	477	480	646	59	99	1088
Turn Type	Prot	NA	NA	Perm	Prot	pt+ov
Protected Phases	7	4	8		1	1 7
Permitted Phases				8		
Actuated Green, G (s)	27.6	59.8	27.7	27.7	44.6	76.7
Effective Green, g (s)	27.6	59.8	27.7	27.7	44.6	76.7
Actuated g/C Ratio	0.24	0.53	0.24	0.24	0.39	0.68
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	827	1848	856	383	1337	1866
v/s Ratio Prot	0.14	0.14	c0.18		0.03	c0.39
v/s Ratio Perm				0.04		
v/c Ratio	0.58	0.26	0.75	0.15	0.07	0.58
Uniform Delay, d1	37.8	14.7	39.7	33.6	21.5	9.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.1	3.8	0.2	0.1	1.3
Delay (s)	40.7	14.8	43.5	33.8	21.6	11.1
Level of Service	D	B	D	C	C	B
Approach Delay (s)		27.7	40.9		12.0	
Approach LOS		C	D		B	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	113.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	429	432	581	217	89	1006
Future Volume (veh/h)	429	432	581	217	89	1006
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	477	480	646	241	99	1118
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	850	1826	809	361	1375	1796
Arrive On Green	0.25	0.52	0.23	0.23	0.40	0.40
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768
Grp Volume(v), veh/h	477	480	646	241	99	1118
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384
Q Serve(g_s), s	13.5	8.4	19.2	15.5	2.0	26.4
Cycle Q Clear(g_c), s	13.5	8.4	19.2	15.5	2.0	26.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	850	1826	809	361	1375	1796
V/C Ratio(X)	0.56	0.26	0.80	0.67	0.07	0.62
Avail Cap(c_a), veh/h	850	2113	1096	489	1375	1796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	14.9	40.3	38.9	20.5	11.5
Incr Delay (d2), s/veh	2.7	0.1	3.0	2.1	0.1	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	3.3	8.5	13.4	0.8	23.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.1	15.0	43.4	41.0	20.6	13.1
LnGrp LOS	D	B	D	D	C	B
Approach Vol, veh/h		957	887		1217	
Approach Delay, s/veh		27.0	42.7		13.7	
Approach LOS		C	D		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				62.0		49.0	32.0	30.0
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				66.5		44.5	27.5	34.5
Max Q Clear Time (g_c+I1), s				10.4		28.4	15.5	21.2
Green Ext Time (p_c), s				3.5		5.3	1.4	4.3

Intersection Summary			
HCM 6th Ctrl Delay			26.3
HCM 6th LOS			C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	96	668	1141	219	151	187
v/c Ratio	0.73	0.28	0.81	0.35	0.10	0.24
Control Delay	92.8	20.5	39.3	28.0	22.3	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.8	20.5	39.3	28.0	22.3	10.8
Queue Length 50th (ft)	41	120	439	126	36	34
Queue Length 95th (ft)	#101	146	520	188	70	99
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	132	3234	1992	891	1548	776
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.21	0.57	0.25	0.10	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	86	601	1027	197	136	168
Future Volume (vph)	86	601	1027	197	136	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3400	5036	3505	1568	3400	1568
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3400	5036	3505	1568	3400	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	96	668	1141	219	151	187
RTOR Reduction (vph)	0	0	0	0	0	62
Lane Group Flow (vph)	96	668	1141	219	151	125
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	5.0	61.3	51.8	51.8	58.9	58.9
Effective Green, g (s)	5.0	61.3	51.8	51.8	58.9	58.9
Actuated g/C Ratio	0.04	0.47	0.40	0.40	0.46	0.46
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	131	2389	1405	628	1550	714
v/s Ratio Prot	c0.03	0.13	c0.33		0.04	c0.08
v/s Ratio Perm				0.14		
v/c Ratio	0.73	0.28	0.81	0.35	0.10	0.18
Uniform Delay, d1	61.4	20.6	34.4	27.0	20.0	20.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.1	0.1	3.7	0.3	0.1	0.5
Delay (s)	91.6	20.6	38.1	27.3	20.1	21.3
Level of Service	F	C	D	C	C	C
Approach Delay (s)		29.5	36.3		20.8	
Approach LOS		C	D		C	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	129.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	601	1027	197	136	168
Future Volume (veh/h)	86	601	1027	197	136	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	96	668	1141	219	151	187
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	135	2375	1389	620	1578	724
Arrive On Green	0.04	0.47	0.39	0.39	0.46	0.46
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	96	668	1141	219	151	187
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	3.5	10.3	36.8	12.5	3.2	9.3
Cycle Q Clear(g_c), s	3.5	10.3	36.8	12.5	3.2	9.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	135	2375	1389	620	1578	724
V/C Ratio(X)	0.71	0.28	0.82	0.35	0.10	0.26
Avail Cap(c_a), veh/h	135	3289	2025	903	1578	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.3	20.7	34.5	27.1	19.4	21.0
Incr Delay (d2), s/veh	27.2	0.1	1.8	0.3	0.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.0	15.8	4.7	1.3	10.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	87.5	20.7	36.3	27.4	19.5	21.9
LnGrp LOS	F	C	D	C	B	C
Approach Vol, veh/h		764	1360		338	
Approach Delay, s/veh		29.1	34.9		20.8	
Approach LOS		C	C		C	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	64.1	63.0	9.5	54.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	82.5	58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s	12.3	11.3	5.5	38.8
Green Ext Time (p_c), s	5.2	1.2	0.0	11.2

Intersection Summary	
HCM 6th Ctrl Delay	31.2
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	96	427	98	223	287
v/c Ratio	0.14	0.28	0.43	0.19	0.45	0.11
Control Delay	19.9	8.2	15.1	5.0	17.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	8.2	15.1	5.0	17.7	3.0
Queue Length 50th (ft)	9	0	45	0	45	11
Queue Length 95th (ft)	34	33	92	26	112	22
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1133	1048	3121	1407	1603	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.09	0.14	0.07	0.14	0.08

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	37	88	393	90	205	264
Future Volume (vph)	37	88	393	90	205	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1568	3505	1568	1752	3505
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1568	3505	1568	1752	3505
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	96	427	98	223	287
RTOR Reduction (vph)	0	84	0	70	0	0
Lane Group Flow (vph)	40	12	427	28	223	287
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	5.2	5.2	12.5	12.5	11.9	28.9
Effective Green, g (s)	5.2	5.2	12.5	12.5	11.9	28.9
Actuated g/C Ratio	0.12	0.12	0.29	0.29	0.28	0.67
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	211	189	1016	454	483	2350
v/s Ratio Prot	c0.02		c0.12		c0.13	0.08
v/s Ratio Perm		0.01		0.02		
v/c Ratio	0.19	0.06	0.42	0.06	0.46	0.12
Uniform Delay, d1	17.1	16.8	12.4	11.1	12.9	2.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.3	0.1	0.7	0.0
Delay (s)	17.5	16.9	12.7	11.1	13.6	2.6
Level of Service	B	B	B	B	B	A
Approach Delay (s)	17.1		12.4			7.4
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	43.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	88	393	90	205	264
Future Volume (veh/h)	37	88	393	90	205	264
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	96	427	98	223	287
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	195	174	932	416	348	2130
Arrive On Green	0.11	0.11	0.26	0.26	0.20	0.60
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	40	96	427	98	223	287
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	0.6	1.8	3.2	1.5	3.7	1.1
Cycle Q Clear(g_c), s	0.6	1.8	3.2	1.5	3.7	1.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	195	174	932	416	348	2130
V/C Ratio(X)	0.21	0.55	0.46	0.24	0.64	0.13
Avail Cap(c_a), veh/h	1429	1271	4416	1969	2325	9558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.8	13.3	9.7	9.1	11.6	2.7
Incr Delay (d2), s/veh	0.5	2.7	0.4	0.3	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.6	0.8	0.4	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.3	16.0	10.1	9.4	13.6	2.7
LnGrp LOS	B	B	B	A	B	A
Approach Vol, veh/h	136		525			510
Approach Delay, s/veh	15.2		9.9			7.5
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.7	12.8				23.6		8.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	41.5	39.5				85.5		25.5
Max Q Clear Time (g_c+I1), s	5.7	5.2				3.1		3.8
Green Ext Time (p_c), s	0.6	3.1				1.9		0.3

Intersection Summary	
HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	70	108	170	168	113	43	378	103	140	615
v/c Ratio	0.26	0.34	0.44	0.39	0.24	0.18	0.45	0.33	0.24	0.67
Control Delay	31.0	28.8	29.0	26.3	5.0	32.0	23.7	30.2	20.8	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	28.8	29.0	26.3	5.0	32.0	23.7	30.2	20.8	6.4
Queue Length 50th (ft)	24	34	57	54	0	15	62	35	42	0
Queue Length 95th (ft)	73	95	138	130	29	53	128	95	101	81
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	406	710	795	1057	956	300	2561	547	1531	1406
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.15	0.21	0.16	0.12	0.14	0.15	0.19	0.09	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	81	18	156	155	104	40	301	47	95	129	566
Future Volume (vph)	64	81	18	156	155	104	40	301	47	95	129	566
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1793		1752	1845	1568	1752	3434		1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	1793		1752	1845	1568	1752	3434		1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	70	88	20	170	168	113	43	327	51	103	140	615
RTOR Reduction (vph)	0	7	0	0	0	87	0	12	0	0	0	428
Lane Group Flow (vph)	70	101	0	170	168	26	43	366	0	103	140	187
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	6.3	7.3		12.9	13.9	13.9	4.0	15.1		7.4	18.5	18.5
Effective Green, g (s)	6.3	7.3		12.9	13.9	13.9	4.0	15.1		7.4	18.5	18.5
Actuated g/C Ratio	0.10	0.12		0.21	0.23	0.23	0.07	0.25		0.12	0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	181	215		372	422	359	115	854		213	562	477
v/s Ratio Prot	0.04	0.06		c0.10	c0.09		0.02	0.11		c0.06	0.08	
v/s Ratio Perm						0.02						c0.12
v/c Ratio	0.39	0.47		0.46	0.40	0.07	0.37	0.43		0.48	0.25	0.39
Uniform Delay, d1	25.4	24.9		20.8	19.9	18.3	27.2	19.2		24.9	15.9	16.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	1.6		0.9	0.6	0.1	2.0	0.3		1.7	0.2	0.5
Delay (s)	26.8	26.5		21.7	20.5	18.4	29.2	19.5		26.6	16.1	17.2
Level of Service	C	C		C	C	B	C	B		C	B	B
Approach Delay (s)		26.6			20.4			20.5			18.2	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	81	18	156	155	104	40	301	47	95	129	566
Future Volume (veh/h)	64	81	18	156	155	104	40	301	47	95	129	566
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	88	20	170	168	113	43	327	51	103	140	615
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	141	32	220	305	259	75	1257	194	135	825	700
Arrive On Green	0.06	0.10	0.10	0.12	0.16	0.16	0.04	0.41	0.41	0.08	0.44	0.44
Sat Flow, veh/h	1767	1463	333	1767	1856	1572	1767	3061	473	1767	1856	1572
Grp Volume(v), veh/h	70	0	108	170	168	113	43	187	191	103	140	615
Grp Sat Flow(s),veh/h/ln	1767	0	1796	1767	1856	1572	1767	1763	1770	1767	1856	1572
Q Serve(g_s), s	2.4	0.0	3.6	5.7	5.1	4.0	1.5	4.3	4.4	3.5	2.8	22.0
Cycle Q Clear(g_c), s	2.4	0.0	3.6	5.7	5.1	4.0	1.5	4.3	4.4	3.5	2.8	22.0
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	100	0	173	220	305	259	75	724	727	135	825	700
V/C Ratio(X)	0.70	0.00	0.62	0.77	0.55	0.44	0.58	0.26	0.26	0.76	0.17	0.88
Avail Cap(c_a), veh/h	329	0	568	645	917	777	243	1272	1277	444	1549	1313
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	0.0	26.8	26.2	23.7	23.2	29.0	12.0	12.0	27.9	10.3	15.6
Incr Delay (d2), s/veh	8.5	0.0	3.6	5.7	1.5	1.2	6.8	0.2	0.2	8.6	0.1	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.6	2.6	2.2	1.5	0.7	1.5	1.6	1.7	1.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	0.0	30.4	31.8	25.2	24.4	35.8	12.2	12.2	36.6	10.4	19.4
LnGrp LOS	D	A	C	C	C	C	D	B	B	D	B	B
Approach Vol, veh/h		178			451			421			858	
Approach Delay, s/veh		33.0			27.5			14.6			20.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	29.8	12.2	10.5	7.1	31.9	8.0	14.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	44.5	22.5	19.5	8.5	51.5	11.5	30.5
Max Q Clear Time (g_c+I1), s	5.5	6.4	7.7	5.6	3.5	24.0	4.4	7.1
Green Ext Time (p_c), s	0.2	2.4	0.4	0.4	0.0	3.4	0.1	1.3

Intersection Summary			
HCM 6th Ctrl Delay			21.8
HCM 6th LOS			C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	482	1018	636	40	1714	235
v/c Ratio	0.45	0.85	0.31	0.04	0.83	0.15
Control Delay	32.0	26.1	12.0	3.5	22.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	26.1	12.0	3.5	22.6	0.2
Queue Length 50th (ft)	136	209	107	0	465	0
Queue Length 95th (ft)	225	378	179	16	725	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1622	1567	2751	1239	2751	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.65	0.23	0.03	0.62	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	443	0	937	0	585	37	0	1577	216
Future Volume (vph)	0	0	0	443	0	937	0	585	37	0	1577	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.5		4.5		4.5	4.5		4.5	4.0
Lane Util. Factor				0.97		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				3400		2760		3505	1568		3505	1568
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				3400		2760		3505	1568		3505	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	482	0	1018	0	636	40	0	1714	235
RTOR Reduction (vph)	0	0	0	0	0	326	0	0	16	0	0	0
Lane Group Flow (vph)	0	0	0	482	0	692	0	636	24	0	1714	235
Turn Type				Prot		Prot		NA	Perm		NA	Free
Protected Phases				8		8		2			6	
Permitted Phases									2			Free
Actuated Green, G (s)				34.2		34.2		63.7	63.7		63.7	106.9
Effective Green, g (s)				34.2		34.2		63.7	63.7		63.7	106.9
Actuated g/C Ratio				0.32		0.32		0.60	0.60		0.60	1.00
Clearance Time (s)				4.5		4.5		4.5	4.5		4.5	
Vehicle Extension (s)				3.0		3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)				1087		882		2088	934		2088	1568
v/s Ratio Prot				0.14		c0.25		0.18			c0.49	
v/s Ratio Perm									0.02			0.15
v/c Ratio				0.44		0.78		0.30	0.03		0.82	0.15
Uniform Delay, d1				28.8		33.0		10.7	8.9		17.1	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.3		4.6		0.1	0.0		2.7	0.2
Delay (s)				29.1		37.6		10.7	8.9		19.8	0.2
Level of Service				C		D		B	A		B	A
Approach Delay (s)		0.0			34.9			10.6			17.4	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	106.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	443	0	937	0	585	37	0	1577	216
Future Volume (veh/h)	0	0	0	443	0	937	0	585	37	0	1577	216
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				482	0	1018	0	636	40	0	1714	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1275	0	1029	0	1966	877	0	1966	
Arrive On Green				0.37	0.00	0.37	0.00	0.56	0.56	0.00	0.56	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				482	0	1018	0	636	40	0	1714	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				13.1	0.0	46.7	0.0	12.4	1.5	0.0	53.5	0.0
Cycle Q Clear(g_c), s				13.1	0.0	46.7	0.0	12.4	1.5	0.0	53.5	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1275	0	1029	0	1966	877	0	1966	
V/C Ratio(X)				0.38	0.00	0.99	0.00	0.32	0.05	0.00	0.87	
Avail Cap(c_a), veh/h				1275	0	1029	0	2305	1028	0	2305	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				29.3	0.0	39.8	0.0	15.2	12.8	0.0	24.3	0.0
Incr Delay (d2), s/veh				0.2	0.0	25.3	0.0	0.1	0.0	0.0	3.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.3	0.0	18.9	0.0	4.8	0.5	0.0	21.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.5	0.0	65.1	0.0	15.3	12.8	0.0	27.8	0.0
LnGrp LOS				C	A	E	A	B	B	A	C	
Approach Vol, veh/h					1500			676			1714	
Approach Delay, s/veh					53.7			15.2			27.8	
Approach LOS					D			B			C	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		75.7				75.7		52.0				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		83.5				83.5		47.5				
Max Q Clear Time (g_c+I1), s		14.4				55.5		48.7				
Green Ext Time (p_c), s		4.8				15.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		35.6
HCM 6th LOS		D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	292	745	1093	173	866	1321	342	53	64	219
v/c Ratio	0.92	0.86	0.70	0.86	0.95	0.96	0.45	0.38	0.41	0.42
Control Delay	78.6	50.6	2.6	83.4	63.9	48.6	14.1	55.6	55.6	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.6	50.6	2.6	83.4	63.9	48.6	14.1	55.6	55.6	19.3
Queue Length 50th (ft)	205	266	0	122	221	465	84	36	44	66
Queue Length 95th (ft)	#387	#387	0	#258	#328	#655	173	77	87	133
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	318	869	1568	202	912	1378	780	294	335	517
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.86	0.70	0.86	0.95	0.96	0.44	0.18	0.19	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	745	1093	173	801	65	1321	77	265	53	64	219
Future Volume (vph)	292	745	1093	173	801	65	1321	77	265	53	64	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	4979		3400	1630		1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	3505	1568	1752	4979		3400	1630		1752	1845	1568
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	292	745	1093	173	801	65	1321	77	265	53	64	219
RTOR Reduction (vph)	0	0	0	0	7	0	0	98	0	0	0	71
Lane Group Flow (vph)	292	745	1093	173	859	0	1321	244	0	53	64	148
Turn Type	Prot	NA	Free	Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases			Free									6
Actuated Green, G (s)	19.6	26.8	108.6	12.4	19.6		43.6	44.0		7.4	7.8	27.4
Effective Green, g (s)	19.6	26.8	108.6	12.4	19.6		43.6	44.0		7.4	7.8	27.4
Actuated g/C Ratio	0.18	0.25	1.00	0.11	0.18		0.40	0.41		0.07	0.07	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	316	864	1568	200	898		1365	660		119	132	460
v/s Ratio Prot	c0.17	c0.21		0.10	0.17		c0.39	0.15		0.03	0.03	0.06
v/s Ratio Perm			c0.70									0.04
v/c Ratio	0.92	0.86	0.70	0.86	0.96		0.97	0.37		0.45	0.48	0.32
Uniform Delay, d1	43.8	39.1	0.0	47.3	44.1		31.8	22.6		48.6	48.5	33.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	8.9	2.6	30.0	20.0		17.0	0.4		2.6	2.8	0.4
Delay (s)	75.2	48.0	2.6	77.2	64.1		48.9	22.9		51.3	51.3	33.4
Level of Service	E	D	A	E	E		D	C		D	D	C
Approach Delay (s)		28.4			66.3			43.5			39.7	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	745	1093	173	801	65	1321	77	265	53	64	219
Future Volume (veh/h)	292	745	1093	173	801	65	1321	77	265	53	64	219
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	292	745	0	173	801	65	1321	77	0	53	64	219
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	297	808		189	803	65	1285	856		84	248	475
Arrive On Green	0.17	0.23	0.00	0.11	0.17	0.17	0.37	0.46	0.00	0.05	0.13	0.13
Sat Flow, veh/h	1767	3526	1572	1767	4777	386	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	292	745	0	173	565	301	1321	77	0	53	64	219
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1786	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	19.1	24.0	0.0	11.2	19.4	19.5	43.5	2.7	0.0	3.4	3.6	13.1
Cycle Q Clear(g_c), s	19.1	24.0	0.0	11.2	19.4	19.5	43.5	2.7	0.0	3.4	3.6	13.1
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	808		189	568	300	1285	856		84	248	475
V/C Ratio(X)	0.98	0.92		0.92	1.00	1.00	1.03	0.09		0.63	0.26	0.46
Avail Cap(c_a), veh/h	297	808		189	568	300	1285	856		274	312	529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.1	43.7	0.0	51.3	48.2	48.3	36.3	17.6	0.0	54.3	45.1	32.8
Incr Delay (d2), s/veh	47.5	15.9	0.0	42.5	36.7	52.5	32.5	0.0	0.0	7.7	0.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.1	11.9	0.0	7.1	10.9	12.8	23.6	1.2	0.0	1.7	1.7	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.6	59.6	0.0	93.8	84.9	100.8	68.7	17.6	0.0	62.0	45.6	33.5
LnGrp LOS	F	E		F	F	F	F	B		E	D	C
Approach Vol, veh/h		1037			1039			1398			336	
Approach Delay, s/veh		69.7			91.0			65.9			40.3	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	58.1	16.9	31.1	48.0	20.0	24.0	24.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	45.0	12.4	26.6	43.5	19.5	19.5	19.5
Max Q Clear Time (g_c+I1), s	5.4	4.7	13.2	26.0	45.5	15.1	21.1	21.5
Green Ext Time (p_c), s	0.1	0.4	0.0	0.3	0.0	0.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	71.5
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	70	895	298	39	871	209	34	2	5
v/c Ratio	0.23	0.51	0.32	0.15	0.57	0.31	0.06	0.01	0.01
Control Delay	27.1	11.4	2.8	28.5	14.2	23.9	0.2	31.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	11.4	2.8	28.5	14.2	23.9	0.2	31.0	0.0
Queue Length 50th (ft)	19	53	0	11	104	28	0	1	0
Queue Length 95th (ft)	73	236	42	48	242	85	0	8	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	534	3207	1460	376	3122	1267	1176	257	873
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.28	0.20	0.10	0.28	0.16	0.03	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	823	274	36	801	0	192	0	31	2	0	5
Future Volume (vph)	64	823	274	36	801	0	192	0	31	2	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1752	3505	1568	1752	3505		3400		1568	1752	1568	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)	1752	3505	1568	1752	3505		3400		1568	1752	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	70	895	298	39	871	0	209	0	34	2	0	5
RTOR Reduction (vph)	0	0	164	0	0	0	0	0	28	0	5	0
Lane Group Flow (vph)	70	895	134	39	871	0	209	0	6	2	0	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot		Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	4.7	25.7	25.7	2.5	23.5		10.2		10.2	0.7	0.7	
Effective Green, g (s)	4.7	25.7	25.7	2.5	23.5		10.2		10.2	0.7	0.7	
Actuated g/C Ratio	0.08	0.45	0.45	0.04	0.41		0.18		0.18	0.01	0.01	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	144	1577	705	76	1442		607		280	21	19	
v/s Ratio Prot	c0.04	c0.26		0.02	0.25		c0.06			0.00	0.00	
v/s Ratio Perm			0.09						c0.00			
v/c Ratio	0.49	0.57	0.19	0.51	0.60		0.34		0.02	0.10	0.00	
Uniform Delay, d1	25.0	11.6	9.4	26.7	13.2		20.5		19.3	27.9	27.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.5	0.1	5.7	0.7		0.3		0.0	2.0	0.1	
Delay (s)	27.6	12.1	9.6	32.4	13.9		20.9		19.4	29.9	27.9	
Level of Service	C	B	A	C	B		C		B	C	C	
Approach Delay (s)		12.3			14.7			20.7			28.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	57.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	823	274	36	801	0	192	0	31	2	0	5
Future Volume (veh/h)	64	823	274	36	801	0	192	0	31	2	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	895	0	39	871	0	209	0	34	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	114	1459		76	1382	0	361	273	231	5	0	70
Arrive On Green	0.06	0.41	0.00	0.04	0.39	0.00	0.11	0.00	0.15	0.00	0.00	0.04
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	70	895	0	39	871	0	209	0	34	2	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.8	9.1	0.0	1.0	9.1	0.0	2.7	0.0	0.9	0.1	0.0	0.1
Cycle Q Clear(g_c), s	1.8	9.1	0.0	1.0	9.1	0.0	2.7	0.0	0.9	0.1	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	114	1459		76	1382	0	361	273	231	5	0	70
V/C Ratio(X)	0.61	0.61		0.52	0.63	0.00	0.58	0.00	0.15	0.41	0.00	0.07
Avail Cap(c_a), veh/h	522	4205		367	3896	0	1238	1279	1084	251	0	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	10.5	0.0	21.4	11.2	0.0	19.5	0.0	17.0	22.7	0.0	20.9
Incr Delay (d2), s/veh	5.3	0.4	0.0	5.4	0.5	0.0	1.5	0.0	0.3	47.7	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.5	0.0	0.5	2.6	0.0	1.0	0.0	0.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	10.9	0.0	26.8	11.7	0.0	21.0	0.0	17.3	70.5	0.0	21.4
LnGrp LOS	C	B		C	B	A	C	A	B	E	A	C
Approach Vol, veh/h		965			910			243			7	
Approach Delay, s/veh		12.0			12.3			20.4			35.4	
Approach LOS		B			B			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	11.2	6.5	23.4	9.3	6.5	7.4	22.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	31.5	9.5	54.5	16.5	21.5	13.5	50.5
Max Q Clear Time (g_c+I1), s	2.1	2.9	3.0	11.1	4.7	2.1	3.8	11.1
Green Ext Time (p_c), s	0.0	0.1	0.0	7.1	0.5	0.0	0.1	6.8

Intersection Summary	
HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	625	271	50	701	154	27
v/c Ratio	0.33	0.28	0.12	0.31	0.18	0.06
Control Delay	8.9	2.7	17.7	4.6	16.0	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	2.7	17.7	4.6	16.0	9.1
Queue Length 50th (ft)	30	0	7	34	10	0
Queue Length 95th (ft)	110	35	39	61	43	17
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3488	1562	1244	3505	2698	1250
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.17	0.04	0.20	0.06	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	575	249	46	645	142	25
Future Volume (vph)	575	249	46	645	142	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1568	1752	3505	3400	1568
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1568	1752	3505	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	625	271	50	701	154	27
RTOR Reduction (vph)	0	152	0	0	0	23
Lane Group Flow (vph)	625	119	50	701	154	4
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	17.0	17.0	2.3	23.8	5.9	5.9
Effective Green, g (s)	17.0	17.0	2.3	23.8	5.9	5.9
Actuated g/C Ratio	0.44	0.44	0.06	0.61	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1539	688	104	2155	518	239
v/s Ratio Prot	c0.18		0.03	c0.20	c0.05	
v/s Ratio Perm		0.08				0.00
v/c Ratio	0.41	0.17	0.48	0.33	0.30	0.02
Uniform Delay, d1	7.4	6.6	17.6	3.6	14.6	13.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	3.5	0.1	0.3	0.0
Delay (s)	7.6	6.7	21.1	3.7	14.9	14.0
Level of Service	A	A	C	A	B	B
Approach Delay (s)	7.3			4.8	14.7	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	38.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	575	249	46	645	142	25
Future Volume (veh/h)	575	249	46	645	142	25
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	625	271	50	701	154	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1254	559	251	2207	404	186
Arrive On Green	0.36	0.36	0.14	0.63	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	625	271	50	701	154	27
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	4.9	4.7	0.9	3.3	1.5	0.5
Cycle Q Clear(g_c), s	4.9	4.7	0.9	3.3	1.5	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1254	559	251	2207	404	186
V/C Ratio(X)	0.50	0.48	0.20	0.32	0.38	0.15
Avail Cap(c_a), veh/h	5367	2394	1232	8276	2780	1275
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	8.8	13.3	3.1	14.3	13.9
Incr Delay (d2), s/veh	0.3	0.7	0.4	0.1	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.1	0.3	0.2	0.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.5	13.7	3.2	14.9	14.3
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	896			751	181	
Approach Delay, s/veh	9.3			3.9	14.8	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	8.6	9.5	17.0	26.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	24.5	53.5	82.5
Max Q Clear Time (g_c+I1), s	3.5	2.9	6.9	5.3
Green Ext Time (p_c), s	0.6	0.1	5.6	5.3

Intersection Summary	
HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1415	203	1049	40	17	185	133	91
v/c Ratio	0.44	0.83	0.69	0.50	0.04	0.07	0.41	0.75	0.24
Control Delay	56.0	27.7	55.1	14.6	2.2	35.8	10.0	65.6	13.5
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	27.9	55.1	14.6	2.2	35.8	10.0	65.6	13.5
Queue Length 50th (ft)	49	395	130	207	0	9	7	86	9
Queue Length 95th (ft)	106	604	233	330	11	30	66	164	52
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	227	2119	385	2434	1106	408	620	285	563
Starvation Cap Reductn	0	166	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.72	0.53	0.43	0.04	0.04	0.30	0.47	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1265	37	187	965	37	16	12	158	122	15	69
Future Volume (vph)	69	1265	37	187	965	37	16	12	158	122	15	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3490		1752	3505	1568	1752	1587		1752	1617	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.70	1.00		0.49	1.00	
Satd. Flow (perm)	1752	3490		1752	3505	1568	1288	1587		902	1617	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	1375	40	203	1049	40	17	13	172	133	16	75
RTOR Reduction (vph)	0	2	0	0	0	16	0	138	0	0	60	0
Lane Group Flow (vph)	75	1414	0	203	1049	24	17	47	0	133	31	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	7.7	49.4		16.5	58.2	58.2	19.4	19.4		19.4	19.4	
Effective Green, g (s)	7.7	49.4		16.5	58.2	58.2	19.4	19.4		19.4	19.4	
Actuated g/C Ratio	0.08	0.50		0.17	0.59	0.59	0.20	0.20		0.20	0.20	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	136	1745		292	2064	923	252	311		177	317	
v/s Ratio Prot	0.04	c0.41		c0.12	0.30			0.03			0.02	
v/s Ratio Perm						0.02	0.01			c0.15		
v/c Ratio	0.55	0.81		0.70	0.51	0.03	0.07	0.15		0.75	0.10	
Uniform Delay, d1	43.9	20.8		38.8	11.9	8.5	32.3	32.9		37.4	32.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.8	3.0		7.0	0.2	0.0	0.1	0.2		16.4	0.1	
Delay (s)	48.7	23.7		45.8	12.1	8.5	32.4	33.1		53.8	32.7	
Level of Service	D	C		D	B	A	C	C		D	C	
Approach Delay (s)		25.0			17.3			33.0			45.2	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	1265	37	187	965	37	16	12	158	122	15	69
Future Volume (veh/h)	69	1265	37	187	965	37	16	12	158	122	15	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	1375	40	203	1049	40	17	13	172	133	16	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	97	1680	49	241	1981	884	326	26	350	240	67	316
Arrive On Green	0.05	0.48	0.48	0.14	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1767	3498	102	1767	3526	1572	1295	112	1478	1189	284	1332
Grp Volume(v), veh/h	75	692	723	203	1049	40	17	0	185	133	0	91
Grp Sat Flow(s),veh/h/ln	1767	1763	1837	1767	1763	1572	1295	0	1590	1189	0	1616
Q Serve(g_s), s	3.9	31.1	31.2	10.4	17.2	1.1	1.0	0.0	9.3	10.1	0.0	4.2
Cycle Q Clear(g_c), s	3.9	31.1	31.2	10.4	17.2	1.1	5.2	0.0	9.3	19.3	0.0	4.2
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.93	1.00		0.82
Lane Grp Cap(c), veh/h	97	846	882	241	1981	884	326	0	377	240	0	383
V/C Ratio(X)	0.77	0.82	0.82	0.84	0.53	0.05	0.05	0.00	0.49	0.55	0.00	0.24
Avail Cap(c_a), veh/h	231	1077	1123	392	2474	1104	432	0	507	338	0	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.1	20.6	20.6	38.9	12.6	9.1	30.6	0.0	30.4	38.8	0.0	28.5
Incr Delay (d2), s/veh	12.2	4.0	3.9	8.6	0.2	0.0	0.1	0.0	1.0	2.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	12.9	13.4	5.0	6.3	0.3	0.3	0.0	3.6	3.0	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.4	24.6	24.5	47.5	12.8	9.1	30.7	0.0	31.4	40.8	0.0	28.8
LnGrp LOS	E	C	C	D	B	A	C	A	C	D	A	C
Approach Vol, veh/h		1490			1292			202			224	
Approach Delay, s/veh		26.1			18.2			31.4			35.9	
Approach LOS		C			B			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		26.4	17.1	48.9		26.4	9.6	56.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		29.5	20.5	56.5		29.5	12.1	64.9				
Max Q Clear Time (g_c+I1), s		11.3	12.4	33.2		21.3	5.9	19.2				
Green Ext Time (p_c), s		1.1	0.3	11.2		0.6	0.1	10.2				

Intersection Summary			
HCM 6th Ctrl Delay			23.9
HCM 6th LOS			C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	1101	284	749	92	48	267	109	58	60
v/c Ratio	0.45	0.82	0.77	0.41	0.48	0.28	0.69	0.52	0.24	0.19
Control Delay	55.1	33.8	53.0	15.5	52.2	48.3	15.7	52.1	45.7	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	33.8	53.0	15.5	52.2	48.3	15.7	52.1	45.7	1.3
Queue Length 50th (ft)	45	316	170	137	57	30	0	67	36	0
Queue Length 95th (ft)	101	#533	#336	241	116	69	77	133	78	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	198	1486	434	1930	334	387	540	334	387	437
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.74	0.65	0.39	0.28	0.12	0.49	0.33	0.15	0.14

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	939	74	261	555	134	85	44	246	100	53	55
Future Volume (vph)	67	939	74	261	555	134	85	44	246	100	53	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3467		1752	3402		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3467		1752	3402		1752	1845	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	1021	80	284	603	146	92	48	267	109	58	60
RTOR Reduction (vph)	0	4	0	0	15	0	0	0	240	0	0	52
Lane Group Flow (vph)	73	1097	0	284	734	0	92	48	27	109	58	8
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	7.3	38.8		20.4	51.9		8.9	10.1	10.1	11.6	12.8	12.8
Effective Green, g (s)	7.3	38.8		20.4	51.9		8.9	10.1	10.1	11.6	12.8	12.8
Actuated g/C Ratio	0.07	0.39		0.21	0.52		0.09	0.10	0.10	0.12	0.13	0.13
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	129	1360		361	1785		157	188	160	205	238	202
v/s Ratio Prot	0.04	c0.32		c0.16	0.22		0.05	0.03		c0.06	c0.03	
v/s Ratio Perm									0.02			0.00
v/c Ratio	0.57	0.81		0.79	0.41		0.59	0.26	0.17	0.53	0.24	0.04
Uniform Delay, d1	44.3	26.7		37.2	14.2		43.2	40.9	40.6	41.1	38.7	37.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	3.6		10.8	0.2		5.5	0.7	0.5	2.6	0.5	0.1
Delay (s)	49.9	30.3		48.0	14.4		48.7	41.7	41.1	43.7	39.2	37.7
Level of Service	D	C		D	B		D	D	D	D	D	D
Approach Delay (s)		31.5			23.6			42.9			41.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	939	74	261	555	134	85	44	246	100	53	55
Future Volume (veh/h)	67	939	74	261	555	134	85	44	246	100	53	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	73	1021	80	284	603	146	92	48	267	109	58	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	94	1195	94	321	1378	333	129	350	297	146	368	312
Arrive On Green	0.05	0.36	0.36	0.18	0.49	0.49	0.07	0.19	0.19	0.08	0.20	0.20
Sat Flow, veh/h	1767	3312	259	1767	2816	680	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	73	543	558	284	377	372	92	48	267	109	58	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1809	1767	1763	1733	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	4.0	27.6	27.6	15.2	13.5	13.5	4.9	2.1	16.1	5.8	2.5	3.1
Cycle Q Clear(g_c), s	4.0	27.6	27.6	15.2	13.5	13.5	4.9	2.1	16.1	5.8	2.5	3.1
Prop In Lane	1.00		0.14	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	636	653	321	863	848	129	350	297	146	368	312
V/C Ratio(X)	0.78	0.85	0.85	0.88	0.44	0.44	0.71	0.14	0.90	0.75	0.16	0.19
Avail Cap(c_a), veh/h	195	737	756	428	969	953	330	381	323	330	381	323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	28.6	28.6	38.6	16.1	16.1	43.9	32.7	38.4	43.5	32.1	32.4
Incr Delay (d2), s/veh	12.7	8.6	8.4	15.4	0.3	0.4	7.1	0.2	25.3	7.4	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	12.8	13.1	7.8	5.3	5.2	2.4	1.0	8.2	2.8	1.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	37.2	37.1	54.1	16.4	16.4	51.0	32.9	63.7	50.8	32.3	32.7
LnGrp LOS	E	D	D	D	B	B	D	C	E	D	C	C
Approach Vol, veh/h		1174			1033			407			227	
Approach Delay, s/veh		38.5			26.8			57.2			41.3	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	22.8	22.1	39.5	11.6	23.7	9.7	51.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.1	19.9	23.5	40.5	18.1	19.9	10.7	53.3
Max Q Clear Time (g_c+I1), s	7.8	18.1	17.2	29.6	6.9	5.1	6.0	15.5
Green Ext Time (p_c), s	0.2	0.2	0.5	5.4	0.1	0.3	0.0	5.5

Intersection Summary	
HCM 6th Ctrl Delay	37.1
HCM 6th LOS	D

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	616	32	1628	93	791
v/c Ratio	0.79	0.09	0.82	0.58	0.33
Control Delay	48.6	12.8	22.5	66.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	12.8	22.5	66.5	7.2
Queue Length 50th (ft)	231	0	485	70	110
Queue Length 95th (ft)	301	29	607	#138	143
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	938	416	2308	184	2752
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.08	0.71	0.51	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	563	33	1071	427	86	728
Future Volume (vph)	563	33	1071	427	86	728
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	0.97	0.91	0.95		1.00	0.95
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3406	1427	3355		1752	3505
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3406	1427	3355		1752	3505
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	612	36	1164	464	93	791
RTOR Reduction (vph)	0	25	35	0	0	0
Lane Group Flow (vph)	616	7	1593	0	93	791
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	24.0	24.0	60.8		7.5	72.8
Effective Green, g (s)	24.0	24.0	60.8		7.5	72.8
Actuated g/C Ratio	0.23	0.23	0.57		0.07	0.69
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	772	323	1928		124	2411
v/s Ratio Prot	c0.18		c0.47		c0.05	0.23
v/s Ratio Perm		0.01				
v/c Ratio	0.80	0.02	0.83		0.75	0.33
Uniform Delay, d1	38.6	31.8	18.2		48.2	6.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.8	0.0	3.0		22.2	0.1
Delay (s)	44.4	31.8	21.3		70.4	6.7
Level of Service	D	C	C		E	A
Approach Delay (s)	43.8		21.3			13.4
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	563	33	1071	427	86	728
Future Volume (veh/h)	563	33	1071	427	86	728
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	612	36	1164	464	93	791
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	732	326	1446	559	119	2458
Arrive On Green	0.21	0.21	0.58	0.58	0.07	0.70
Sat Flow, veh/h	3534	1572	2577	961	1767	3618
Grp Volume(v), veh/h	612	36	815	813	93	791
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1683	1767	1763
Q Serve(g_s), s	15.6	1.7	33.8	36.7	4.9	8.2
Cycle Q Clear(g_c), s	15.6	1.7	33.8	36.7	4.9	8.2
Prop In Lane	1.00	1.00		0.57	1.00	
Lane Grp Cap(c), veh/h	732	326	1026	980	119	2458
V/C Ratio(X)	0.84	0.11	0.79	0.83	0.78	0.32
Avail Cap(c_a), veh/h	1034	460	1284	1226	197	3131
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	30.3	15.3	15.9	43.2	5.6
Incr Delay (d2), s/veh	4.3	0.1	2.8	4.0	10.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.7	13.0	13.7	2.5	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.0	30.4	18.1	19.9	53.8	5.6
LnGrp LOS	D	C	B	B	D	A
Approach Vol, veh/h	648		1628			884
Approach Delay, s/veh	39.5		19.0			10.7
Approach LOS	D		B			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.8	59.2				70.1		24.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	68.5				83.5		27.5
Max Q Clear Time (g_c+I1), s	6.9	38.7				10.2		17.6
Green Ext Time (p_c), s	0.1	16.0				6.9		1.9

Intersection Summary		
HCM 6th Ctrl Delay		20.9
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	158	250	531	388	177
v/c Ratio	0.37	0.14	0.52	0.43	0.35
Control Delay	20.0	5.4	9.6	16.2	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	5.4	9.6	16.2	5.7
Queue Length 50th (ft)	35	13	27	41	0
Queue Length 95th (ft)	96	32	75	92	43
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1272	3505	2748	2711	1189
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.19	0.14	0.15

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	145	230	212	277	290	230
Future Volume (vph)	145	230	212	277	290	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	0.91
Frt	1.00	1.00	0.91		0.97	0.85
Flt Protected	0.95	1.00	1.00		0.96	1.00
Satd. Flow (prot)	1752	3505	3207		3342	1427
Flt Permitted	0.95	1.00	1.00		0.96	1.00
Satd. Flow (perm)	1752	3505	3207		3342	1427
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	250	230	301	315	250
RTOR Reduction (vph)	0	0	218	0	18	130
Lane Group Flow (vph)	158	250	313	0	370	47
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	8.0	23.4	10.9		11.8	11.8
Effective Green, g (s)	8.0	23.4	10.9		11.8	11.8
Actuated g/C Ratio	0.18	0.53	0.25		0.27	0.27
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	317	1855	790		892	380
v/s Ratio Prot	c0.09	0.07	c0.10		c0.11	
v/s Ratio Perm						0.03
v/c Ratio	0.50	0.13	0.40		0.41	0.12
Uniform Delay, d1	16.3	5.3	13.9		13.4	12.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.0	0.3		0.3	0.1
Delay (s)	17.5	5.3	14.2		13.7	12.4
Level of Service	B	A	B		B	B
Approach Delay (s)		10.0	14.2		13.3	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	145	230	212	277	290	230
Future Volume (veh/h)	145	230	212	277	290	230
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	158	250	230	301	373	188
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	215	1946	551	491	751	334
Arrive On Green	0.12	0.55	0.31	0.31	0.21	0.21
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	158	250	230	301	373	188
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	3.3	1.3	3.9	6.2	3.5	4.1
Cycle Q Clear(g_c), s	3.3	1.3	3.9	6.2	3.5	4.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	215	1946	551	491	751	334
V/C Ratio(X)	0.73	0.13	0.42	0.61	0.50	0.56
Avail Cap(c_a), veh/h	1457	6875	1776	1585	3377	1502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	4.1	10.4	11.2	13.2	13.5
Incr Delay (d2), s/veh	4.8	0.0	0.5	1.2	0.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.3	1.2	1.8	1.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.0	4.2	10.9	12.4	13.8	14.9
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		408	531		561	
Approach Delay, s/veh		10.7	11.8		14.1	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				25.6		12.6	9.2	16.4
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				74.5		36.5	31.5	38.5
Max Q Clear Time (g_c+I1), s				3.3		6.1	5.3	8.2
Green Ext Time (p_c), s				1.8		2.1	0.4	3.7

Intersection Summary			
HCM 6th Ctrl Delay			12.4
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	13	440	7	22	410	167	27	306
v/c Ratio	0.29	0.04	0.67	0.04	0.10	0.68	0.09	0.14	0.45
Control Delay	31.8	24.6	8.8	36.0	25.1	25.0	9.5	35.2	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	24.6	8.8	36.0	25.1	25.0	9.5	35.2	21.8
Queue Length 50th (ft)	19	3	0	2	3	94	6	7	30
Queue Length 95th (ft)	85	22	84	18	29	298	45	42	107
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	415	1068	1093	182	772	1432	3109	216	1398
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.01	0.40	0.04	0.03	0.29	0.05	0.13	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	12	405	6	11	9	377	150	4	25	183	98
Future Volume (vph)	70	12	405	6	11	9	377	150	4	25	183	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1568	1752	1719		1752	3492		1752	3321	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1568	1752	1719		1752	3492		1752	3321	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	13	440	7	12	10	410	163	4	27	199	107
RTOR Reduction (vph)	0	0	362	0	9	0	0	1	0	0	56	0
Lane Group Flow (vph)	76	13	78	7	13	0	410	166	0	27	250	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.1	11.5	11.5	0.7	5.1		20.3	33.1		1.9	14.7	
Effective Green, g (s)	7.1	11.5	11.5	0.7	5.1		20.3	33.1		1.9	14.7	
Actuated g/C Ratio	0.11	0.18	0.18	0.01	0.08		0.31	0.51		0.03	0.23	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	325	276	18	134		545	1772		51	748	
v/s Ratio Prot	c0.04	0.01		0.00	0.01		c0.23	0.05		0.02	c0.08	
v/s Ratio Perm			c0.05									
v/c Ratio	0.40	0.04	0.28	0.39	0.10		0.75	0.09		0.53	0.33	
Uniform Delay, d1	27.1	22.3	23.3	32.0	27.9		20.2	8.3		31.2	21.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.1	0.6	13.4	0.3		5.8	0.0		9.6	0.3	
Delay (s)	28.4	22.3	23.8	45.4	28.2		26.0	8.3		40.8	21.4	
Level of Service	C	C	C	D	C		C	A		D	C	
Approach Delay (s)		24.5			32.4			20.9			23.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	12	405	6	11	9	377	150	4	25	183	98
Future Volume (veh/h)	70	12	405	6	11	9	377	150	4	25	183	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	13	440	7	12	10	410	163	4	27	199	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	585	496	16	251	209	476	1330	33	52	311	160
Arrive On Green	0.06	0.32	0.32	0.01	0.27	0.27	0.27	0.38	0.38	0.03	0.14	0.14
Sat Flow, veh/h	1767	1856	1572	1767	936	780	1767	3517	86	1767	2250	1160
Grp Volume(v), veh/h	76	13	440	7	0	22	410	81	86	27	154	152
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1715	1767	1763	1840	1767	1763	1647
Q Serve(g_s), s	2.8	0.3	17.9	0.3	0.0	0.6	14.8	2.0	2.0	1.0	5.5	5.9
Cycle Q Clear(g_c), s	2.8	0.3	17.9	0.3	0.0	0.6	14.8	2.0	2.0	1.0	5.5	5.9
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.05	1.00		0.70
Lane Grp Cap(c), veh/h	100	585	496	16	0	460	476	667	696	52	244	228
V/C Ratio(X)	0.76	0.02	0.89	0.43	0.00	0.05	0.86	0.12	0.12	0.52	0.63	0.67
Avail Cap(c_a), veh/h	329	843	714	145	0	600	1171	1562	1630	171	564	527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	15.9	21.9	33.1	0.0	18.2	23.3	13.6	13.6	32.1	27.3	27.5
Incr Delay (d2), s/veh	11.3	0.0	9.6	17.4	0.0	0.0	4.7	0.1	0.1	7.8	2.7	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.1	7.4	0.2	0.0	0.2	6.2	0.7	0.8	0.5	2.4	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.5	15.9	31.4	50.5	0.0	18.3	28.1	13.7	13.7	39.9	30.0	30.8
LnGrp LOS	D	B	C	D	A	B	C	B	B	D	C	C
Approach Vol, veh/h		529			29			577			333	
Approach Delay, s/veh		32.7			26.0			23.9			31.2	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	29.9	5.1	25.7	22.6	13.8	8.3	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	59.5	5.5	30.5	44.5	21.5	12.5	23.5				
Max Q Clear Time (g_c+I1), s	3.0	4.0	2.3	19.9	16.8	7.9	4.8	2.6				
Green Ext Time (p_c), s	0.0	1.0	0.0	1.3	1.3	1.4	0.1	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			28.8									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	135	454	48	219	291	422	40	522
v/c Ratio	0.49	0.45	0.27	0.45	0.67	0.28	0.25	0.65
Control Delay	39.9	16.4	42.4	33.3	36.2	15.1	43.8	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	16.4	42.4	33.3	36.2	15.1	43.8	26.0
Queue Length 50th (ft)	58	51	21	44	121	67	17	85
Queue Length 95th (ft)	145	123	70	103	262	122	62	182
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	471	1402	229	884	834	2622	181	1420
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.32	0.21	0.25	0.35	0.16	0.22	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	201	217	44	157	44	268	323	65	37	285	195
Future Volume (vph)	124	201	217	44	157	44	268	323	65	37	285	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.97		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3232		1752	3390		1752	3416		1752	3291	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	3232		1752	3390		1752	3416		1752	3291	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	218	236	48	171	48	291	351	71	40	310	212
RTOR Reduction (vph)	0	161	0	0	21	0	0	16	0	0	103	0
Lane Group Flow (vph)	135	293	0	48	198	0	291	406	0	40	419	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.1	20.4		4.6	12.9		19.0	33.7		3.9	18.6	
Effective Green, g (s)	12.1	20.4		4.6	12.9		19.0	33.7		3.9	18.6	
Actuated g/C Ratio	0.15	0.25		0.06	0.16		0.24	0.42		0.05	0.23	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	263	818		99	542		413	1428		84	759	
v/s Ratio Prot	c0.08	c0.09		0.03	0.06		c0.17	0.12		0.02	c0.13	
v/s Ratio Perm												
v/c Ratio	0.51	0.36		0.48	0.37		0.70	0.28		0.48	0.55	
Uniform Delay, d1	31.5	24.7		36.9	30.2		28.2	15.5		37.4	27.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.3		3.7	0.4		5.4	0.1		4.2	0.9	
Delay (s)	33.2	25.0		40.6	30.6		33.6	15.6		41.6	28.2	
Level of Service	C	C		D	C		C	B		D	C	
Approach Delay (s)		26.9			32.4			23.0			29.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	201	217	44	157	44	268	323	65	37	285	195
Future Volume (veh/h)	124	201	217	44	157	44	268	323	65	37	285	195
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	135	218	0	48	171	0	291	351	0	40	310	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	180	576		89	395		377	1190		77	593	
Arrive On Green	0.10	0.16	0.00	0.05	0.11	0.00	0.21	0.34	0.00	0.04	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	135	218	0	48	171	0	291	351	0	40	310	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	3.3	2.5	0.0	1.2	2.0	0.0	6.9	3.3	0.0	1.0	3.6	0.0
Cycle Q Clear(g_c), s	3.3	2.5	0.0	1.2	2.0	0.0	6.9	3.3	0.0	1.0	3.6	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	180	576		89	395		377	1190		77	593	
V/C Ratio(X)	0.75	0.38		0.54	0.43		0.77	0.29		0.52	0.52	
Avail Cap(c_a), veh/h	775	2261		378	1467		1372	4482		298	2340	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.4	16.6	0.0	20.6	18.4	0.0	16.5	10.8	0.0	20.8	16.9	0.0
Incr Delay (d2), s/veh	6.2	0.4	0.0	5.0	0.8	0.0	3.4	0.1	0.0	5.2	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.9	0.0	0.5	0.7	0.0	2.7	1.0	0.0	0.5	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	17.0	0.0	25.6	19.2	0.0	19.9	11.0	0.0	26.0	17.6	0.0
LnGrp LOS	C	B		C	B		B	B		C	B	
Approach Vol, veh/h		353			219			642			350	
Approach Delay, s/veh		20.3			20.6			15.0			18.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	19.5	6.7	11.8	14.0	12.0	9.0	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	56.5	9.5	28.5	34.5	29.5	19.5	18.5
Max Q Clear Time (g_c+I1), s	3.0	5.3	3.2	4.5	8.9	5.6	5.3	4.0
Green Ext Time (p_c), s	0.0	2.5	0.0	1.3	0.8	1.9	0.3	0.8

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	540	233	435	211	242
v/c Ratio	0.57	0.54	0.21	0.51	0.44
Control Delay	19.8	25.8	5.7	26.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	25.8	5.7	26.1	6.4
Queue Length 50th (ft)	71	67	29	61	0
Queue Length 95th (ft)	153	165	63	153	53
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	2197	1140	3463	1140	1105
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.25	0.20	0.13	0.19	0.22

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	346	151	214	400	194	223
Future Volume (vph)	346	151	214	400	194	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	4.5
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.95		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3345		1752	3505	1752	1568
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3345		1752	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	376	164	233	435	211	242
RTOR Reduction (vph)	42	0	0	0	0	184
Lane Group Flow (vph)	498	0	233	435	211	58
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	15.8		14.3	34.6	13.6	13.6
Effective Green, g (s)	15.8		14.3	34.6	13.6	13.6
Actuated g/C Ratio	0.28		0.25	0.60	0.24	0.24
Clearance Time (s)	4.5		4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	923		438	2120	416	372
v/s Ratio Prot	c0.15		c0.13	0.12	c0.12	
v/s Ratio Perm						0.04
v/c Ratio	0.54		0.53	0.21	0.51	0.15
Uniform Delay, d1	17.6		18.6	5.1	18.9	17.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6		1.2	0.0	1.0	0.2
Delay (s)	18.2		19.8	5.1	19.9	17.4
Level of Service	B		B	A	B	B
Approach Delay (s)	18.2			10.3	18.6	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	346	151	214	400	194	223
Future Volume (veh/h)	346	151	214	400	194	223
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	376	164	233	435	211	242
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	648	278	312	1961	397	353
Arrive On Green	0.27	0.27	0.18	0.56	0.22	0.22
Sat Flow, veh/h	2493	1032	1767	3618	1767	1572
Grp Volume(v), veh/h	275	265	233	435	211	242
Grp Sat Flow(s),veh/h/ln	1763	1670	1767	1763	1767	1572
Q Serve(g_s), s	5.5	5.7	5.1	2.6	4.3	5.8
Cycle Q Clear(g_c), s	5.5	5.7	5.1	2.6	4.3	5.8
Prop In Lane		0.62	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	476	451	312	1961	397	353
V/C Ratio(X)	0.58	0.59	0.75	0.22	0.53	0.69
Avail Cap(c_a), veh/h	1525	1444	1529	6486	1529	1360
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	13.0	16.0	4.6	14.0	14.6
Incr Delay (d2), s/veh	1.1	1.2	3.6	0.1	1.1	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.8	2.0	0.5	1.6	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	14.2	19.6	4.7	15.1	16.9
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	540			668	453	
Approach Delay, s/veh	14.2			9.9	16.1	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	13.7	11.7	15.6	27.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	35.5	35.5	35.5	75.5
Max Q Clear Time (g_c+I1), s	7.8	7.1	7.7	4.6
Green Ext Time (p_c), s	1.5	0.7	3.4	3.1

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	28	1050	71	648	304	121	8
v/c Ratio	0.18	0.73	0.34	0.37	0.69	0.19	0.01
Control Delay	47.5	23.2	45.2	14.1	35.5	0.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	23.2	45.2	14.1	35.5	0.6	0.0
Queue Length 50th (ft)	13	211	33	79	132	0	0
Queue Length 95th (ft)	51	390	98	205	285	0	0
Internal Link Dist (ft)		424		851		1161	269
Turn Bay Length (ft)	125		125		75		
Base Capacity (vph)	169	2249	299	2494	870	1066	1085
Starvation Cap Reductn	0	90	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.49	0.24	0.26	0.35	0.11	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	682	284	65	595	1	280	0	111	0	0	7
Future Volume (vph)	26	682	284	65	595	1	280	0	111	0	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.85			0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1752	3350		1752	3504		1752	1568			1568	
Flt Permitted	0.95	1.00		0.95	1.00		0.75	1.00			1.00	
Satd. Flow (perm)	1752	3350		1752	3504		1388	1568			1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	741	309	71	647	1	304	0	121	0	0	8
RTOR Reduction (vph)	0	37	0	0	0	0	0	83	0	0	6	0
Lane Group Flow (vph)	28	1013	0	71	648	0	304	38	0	0	2	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	1.9	34.7		6.9	39.7		25.0	25.0			25.0	
Effective Green, g (s)	1.9	34.7		6.9	39.7		25.0	25.0			25.0	
Actuated g/C Ratio	0.02	0.43		0.09	0.50		0.31	0.31			0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	41	1451		150	1736		433	489			489	
v/s Ratio Prot	0.02	c0.30		c0.04	0.18			0.02			0.00	
v/s Ratio Perm							c0.22					
v/c Ratio	0.68	0.70		0.47	0.37		0.70	0.08			0.01	
Uniform Delay, d1	38.8	18.4		34.9	12.5		24.3	19.4			19.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	37.9	1.5		2.3	0.1		5.1	0.1			0.0	
Delay (s)	76.7	19.9		37.2	12.6		29.4	19.5			19.0	
Level of Service	E	B		D	B		C	B			B	
Approach Delay (s)		21.4			15.1			26.6			19.0	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	682	284	65	595	1	280	0	111	0	0	7
Future Volume (veh/h)	26	682	284	65	595	1	280	0	111	0	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	741	309	71	647	1	304	0	121	0	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	1045	436	105	1657	3	502	0	428	127	0	428
Arrive On Green	0.03	0.43	0.43	0.06	0.46	0.46	0.27	0.00	0.27	0.00	0.00	0.27
Sat Flow, veh/h	1767	2425	1011	1767	3612	6	1396	0	1572	1260	0	1572
Grp Volume(v), veh/h	28	538	512	71	316	332	304	0	121	0	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1674	1767	1763	1855	1396	0	1572	1260	0	1572
Q Serve(g_s), s	0.9	14.2	14.2	2.2	6.7	6.7	11.6	0.0	3.4	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.9	14.2	14.2	2.2	6.7	6.7	11.8	0.0	3.4	0.0	0.0	0.2
Prop In Lane	1.00		0.60	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	56	759	721	105	809	851	502	0	428	127	0	428
V/C Ratio(X)	0.50	0.71	0.71	0.68	0.39	0.39	0.61	0.00	0.28	0.00	0.00	0.02
Avail Cap(c_a), veh/h	202	1535	1457	357	1690	1778	1239	0	1258	792	0	1258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	27.1	13.3	13.3	26.2	10.1	10.1	19.4	0.0	16.3	0.0	0.0	15.1
Incr Delay (d2), s/veh	6.9	1.2	1.3	7.4	0.3	0.3	1.2	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.8	4.6	1.1	2.2	2.3	3.5	0.0	1.2	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	14.5	14.6	33.6	10.5	10.4	20.6	0.0	16.7	0.0	0.0	15.1
LnGrp LOS	C	B	B	C	B	B	C	A	B	A	A	B
Approach Vol, veh/h		1078			719			425			8	
Approach Delay, s/veh		15.0			12.7			19.5			15.1	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	7.9	29.0		20.0	6.3	30.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		45.5	11.5	49.5		45.5	6.5	54.5				
Max Q Clear Time (g_c+I1), s		13.8	4.2	16.2		2.2	2.9	8.7				
Green Ext Time (p_c), s		1.7	0.1	8.3		0.0	0.0	4.3				
Intersection Summary												
HCM 6th Ctrl Delay			15.1									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1558	1022	927	358	402	1517
v/c Ratio	1.03	0.39	1.03	0.59	0.64	0.82
Control Delay	63.9	6.2	81.2	14.8	50.7	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	47.6
Total Delay	63.9	6.2	81.2	14.8	50.7	67.1
Queue Length 50th (ft)	~664	132	~403	56	150	446
Queue Length 95th (ft)	#802	163	#534	156	204	569
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	1515	2596	902	602	626	1846
Starvation Cap Reductn	0	0	0	0	0	468
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.39	1.03	0.59	0.64	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1402	920	834	322	362	1365
Future Volume (vph)	1402	920	834	322	362	1365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3400	3505	3505	1568	3400	2760
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3400	3505	3505	1568	3400	2760
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1558	1022	927	358	402	1517
RTOR Reduction (vph)	0	0	0	198	0	4
Lane Group Flow (vph)	1558	1022	927	160	402	1513
Turn Type	Prot	NA	NA	Perm	Prot	pt+ov
Protected Phases	7	4	8		1	1 7
Permitted Phases				8		
Actuated Green, G (s)	53.5	88.9	30.9	30.9	22.1	80.1
Effective Green, g (s)	53.5	88.9	30.9	30.9	22.1	80.1
Actuated g/C Ratio	0.45	0.74	0.26	0.26	0.18	0.67
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1515	2596	902	403	626	1842
v/s Ratio Prot	c0.46	0.29	c0.26		0.12	c0.55
v/s Ratio Perm				0.10		
v/c Ratio	1.03	0.39	1.03	0.40	0.64	0.82
Uniform Delay, d1	33.2	5.7	44.6	36.8	45.3	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.7	0.1	37.2	0.6	5.0	4.3
Delay (s)	63.9	5.8	81.8	37.5	50.3	18.9
Level of Service	E	A	F	D	D	B
Approach Delay (s)		40.9	69.5		25.5	
Approach LOS		D	E		C	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1402	920	834	322	362	1365
Future Volume (veh/h)	1402	920	834	322	362	1365
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1558	1022	927	358	402	1517
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1528	2612	908	405	631	1744
Arrive On Green	0.45	0.74	0.26	0.26	0.18	0.18
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768
Grp Volume(v), veh/h	1558	1022	927	358	402	1517
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384
Q Serve(g_s), s	53.5	12.7	30.9	26.3	13.0	22.1
Cycle Q Clear(g_c), s	53.5	12.7	30.9	26.3	13.0	22.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	1528	2612	908	405	631	1744
V/C Ratio(X)	1.02	0.39	1.02	0.88	0.64	0.87
Avail Cap(c_a), veh/h	1528	2612	908	405	631	1744
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	5.7	44.5	42.8	45.2	18.2
Incr Delay (d2), s/veh	28.0	0.1	35.3	20.0	4.9	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.1	4.0	17.7	23.0	6.0	36.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	61.2	5.8	79.9	62.9	50.1	24.4
LnGrp LOS	F	A	F	E	D	C
Approach Vol, veh/h		2580	1285		1919	
Approach Delay, s/veh		39.3	75.1		29.8	
Approach LOS		D	E		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				93.4		26.6	58.0	35.4
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				88.9		22.1	53.5	30.9
Max Q Clear Time (g_c+I1), s				14.7		24.1	55.5	32.9
Green Ext Time (p_c), s				9.4		0.0	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			44.1
HCM 6th LOS			D

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	112	2006	2023	266	834	133
v/c Ratio	0.99	0.72	1.19	0.35	0.63	0.20
Control Delay	152.5	27.2	125.5	25.5	39.6	14.7
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	152.5	27.2	125.5	25.5	39.6	14.7
Queue Length 50th (ft)	57	521	~1249	158	338	37
Queue Length 95th (ft)	#125	577	#1381	228	409	85
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	113	2769	1705	763	1326	656
Starvation Cap Reductn	0	0	29	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.72	1.21	0.35	0.63	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	1805	1821	239	751	120
Future Volume (vph)	101	1805	1821	239	751	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3400	5036	3505	1568	3400	1568
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3400	5036	3505	1568	3400	1568
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	112	2006	2023	266	834	133
RTOR Reduction (vph)	0	0	0	0	0	45
Lane Group Flow (vph)	112	2006	2023	266	834	88
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases				6		
Actuated Green, G (s)	5.0	82.5	73.0	73.0	58.5	58.5
Effective Green, g (s)	5.0	82.5	73.0	73.0	58.5	58.5
Actuated g/C Ratio	0.03	0.55	0.49	0.49	0.39	0.39
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	113	2769	1705	763	1326	611
v/s Ratio Prot	0.03	c0.40	c0.58		c0.25	0.06
v/s Ratio Perm				0.17		
v/c Ratio	0.99	0.72	1.19	0.35	0.63	0.14
Uniform Delay, d1	72.5	25.2	38.5	23.8	37.0	29.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	82.3	1.0	90.2	0.3	2.3	0.5
Delay (s)	154.8	26.2	128.7	24.1	39.2	30.1
Level of Service	F	C	F	C	D	C
Approach Delay (s)		33.0	116.5		38.0	
Approach LOS		C	F		D	

Intersection Summary			
HCM 2000 Control Delay	69.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	1805	1821	239	751	120
Future Volume (veh/h)	101	1805	1821	239	751	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	2006	2023	266	834	133
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	114	2786	1716	765	1337	613
Arrive On Green	0.03	0.55	0.49	0.49	0.39	0.39
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	112	2006	2023	266	834	133
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	4.9	44.3	73.0	15.7	29.4	8.5
Cycle Q Clear(g_c), s	4.9	44.3	73.0	15.7	29.4	8.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	114	2786	1716	765	1337	613
V/C Ratio(X)	0.98	0.72	1.18	0.35	0.62	0.22
Avail Cap(c_a), veh/h	114	2786	1716	765	1337	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.5	25.1	38.5	23.8	36.9	30.5
Incr Delay (d2), s/veh	79.0	0.9	87.0	0.3	2.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	17.5	51.3	5.9	12.8	9.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	151.4	26.1	125.5	24.1	39.1	31.3
LnGrp LOS	F	C	F	C	D	C
Approach Vol, veh/h		2118	2289		967	
Approach Delay, s/veh		32.7	113.7		38.0	
Approach LOS		C	F		D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		87.0		63.0	9.5	77.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		46.3		31.4	6.9	75.0
Green Ext Time (p_c), s		21.8		4.0	0.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			68.2			
HCM 6th LOS			E			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	117	349	502	39	92	532
v/c Ratio	0.30	0.56	0.47	0.08	0.26	0.28
Control Delay	18.6	6.7	14.4	5.7	19.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	6.7	14.4	5.7	19.0	5.2
Queue Length 50th (ft)	25	0	52	0	20	27
Queue Length 95th (ft)	69	55	103	16	59	54
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1648	1496	3081	1383	1107	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.23	0.16	0.03	0.08	0.15

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	108	321	462	36	85	489
Future Volume (vph)	108	321	462	36	85	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1568	3505	1568	1752	3505
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1568	3505	1568	1752	3505
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	349	502	39	92	532
RTOR Reduction (vph)	0	272	0	27	0	0
Lane Group Flow (vph)	117	77	502	12	92	532
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.2	9.2	12.7	12.7	6.4	23.6
Effective Green, g (s)	9.2	9.2	12.7	12.7	6.4	23.6
Actuated g/C Ratio	0.22	0.22	0.30	0.30	0.15	0.56
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	385	345	1064	476	268	1978
v/s Ratio Prot	c0.07		c0.14		0.05	c0.15
v/s Ratio Perm		0.05		0.01		
v/c Ratio	0.30	0.22	0.47	0.02	0.34	0.27
Uniform Delay, d1	13.6	13.4	11.8	10.2	15.8	4.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.3	0.3	0.0	0.8	0.1
Delay (s)	14.1	13.7	12.2	10.2	16.6	4.7
Level of Service	B	B	B	B	B	A
Approach Delay (s)	13.8		12.0			6.5
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	41.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	108	321	462	36	85	489
Future Volume (veh/h)	108	321	462	36	85	489
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	117	349	502	39	92	532
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	510	454	909	405	216	1730
Arrive On Green	0.29	0.29	0.26	0.26	0.12	0.49
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	117	349	502	39	92	532
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	2.1	8.3	5.0	0.8	2.0	3.7
Cycle Q Clear(g_c), s	2.1	8.3	5.0	0.8	2.0	3.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	510	454	909	405	216	1730
V/C Ratio(X)	0.23	0.77	0.55	0.10	0.43	0.31
Avail Cap(c_a), veh/h	1885	1677	3328	1484	1062	5835
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	13.3	13.1	11.5	16.6	6.2
Incr Delay (d2), s/veh	0.2	2.8	0.5	0.1	1.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.5	1.6	0.2	0.7	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.3	16.0	13.6	11.6	17.9	6.3
LnGrp LOS	B	B	B	B	B	A
Approach Vol, veh/h	466		541			624
Approach Delay, s/veh	14.8		13.5			8.0
Approach LOS	B		B			A

Timer - Assigned Phs	1	2		6	8
Phs Duration (G+Y+Rc), s	9.5	15.0		24.5	16.3
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5
Max Green Setting (Gmax), s	24.5	38.5		67.5	43.5
Max Q Clear Time (g_c+I1), s	4.0	7.0		5.7	10.3
Green Ext Time (p_c), s	0.2	3.5		3.8	1.6

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	102	234	127	135	191	90	1106	198	152	515
v/c Ratio	0.56	0.76	0.65	0.36	0.40	0.52	0.82	0.73	0.17	0.51
Control Delay	60.8	60.2	64.6	44.8	9.1	60.6	34.8	61.7	18.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	60.2	64.6	44.8	9.1	60.6	34.8	61.7	18.8	3.6
Queue Length 50th (ft)	74	162	92	89	0	65	375	142	66	0
Queue Length 95th (ft)	135	#283	#173	159	64	122	471	#243	111	59
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	235	367	232	388	480	221	1638	335	998	1084
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.64	0.55	0.35	0.40	0.41	0.68	0.59	0.15	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	179	36	117	124	176	83	838	179	182	140	474
Future Volume (vph)	94	179	36	117	124	176	83	838	179	182	140	474
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1799		1752	1845	1568	1752	3412		1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	1799		1752	1845	1568	1752	3412		1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	195	39	127	135	191	90	911	195	198	152	515
RTOR Reduction (vph)	0	6	0	0	0	153	0	15	0	0	0	275
Lane Group Flow (vph)	102	228	0	127	135	38	90	1091	0	198	152	240
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	9.1	18.9		11.8	21.6	21.6	8.6	42.4		16.3	50.1	50.1
Effective Green, g (s)	9.1	18.9		11.8	21.6	21.6	8.6	42.4		16.3	50.1	50.1
Actuated g/C Ratio	0.08	0.18		0.11	0.20	0.20	0.08	0.39		0.15	0.47	0.47
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	148	316		192	371	315	140	1347		265	860	731
v/s Ratio Prot	0.06	c0.13		c0.07	c0.07		0.05	c0.32		c0.11	0.08	
v/s Ratio Perm						0.02						0.15
v/c Ratio	0.69	0.72		0.66	0.36	0.12	0.64	0.81		0.75	0.18	0.33
Uniform Delay, d1	47.8	41.8		45.9	37.0	35.1	47.9	28.9		43.6	16.7	18.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.6	7.9		8.3	0.6	0.2	9.7	3.7		10.9	0.1	0.3
Delay (s)	60.3	49.7		54.2	37.6	35.3	57.6	32.6		54.5	16.8	18.3
Level of Service	E	D		D	D	D	E	C		D	B	B
Approach Delay (s)		52.9			41.3			34.5			26.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	107.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	179	36	117	124	176	83	838	179	182	140	474
Future Volume (veh/h)	94	179	36	117	124	176	83	838	179	182	140	474
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	102	195	39	127	135	191	90	911	195	198	152	515
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	131	238	48	161	325	276	116	1154	247	240	870	738
Arrive On Green	0.07	0.16	0.16	0.09	0.18	0.18	0.07	0.40	0.40	0.14	0.47	0.47
Sat Flow, veh/h	1767	1501	300	1767	1856	1572	1767	2889	618	1767	1856	1572
Grp Volume(v), veh/h	102	0	234	127	135	191	90	556	550	198	152	515
Grp Sat Flow(s),veh/h/ln	1767	0	1801	1767	1856	1572	1767	1763	1744	1767	1856	1572
Q Serve(g_s), s	4.7	0.0	10.5	5.9	5.4	9.5	4.2	23.1	23.1	9.1	4.0	21.6
Cycle Q Clear(g_c), s	4.7	0.0	10.5	5.9	5.4	9.5	4.2	23.1	23.1	9.1	4.0	21.6
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	131	0	286	161	325	276	116	704	697	240	870	738
V/C Ratio(X)	0.78	0.00	0.82	0.79	0.42	0.69	0.77	0.79	0.79	0.83	0.17	0.70
Avail Cap(c_a), veh/h	290	0	442	286	451	382	273	1023	1012	412	1224	1037
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	0.0	34.0	37.2	30.6	32.3	38.4	22.0	22.0	35.2	12.8	17.5
Incr Delay (d2), s/veh	9.4	0.0	6.9	8.4	0.8	3.1	10.3	2.6	2.7	7.1	0.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	5.0	2.9	2.4	3.8	2.1	9.5	9.4	4.3	1.6	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.4	0.0	40.8	45.6	31.5	35.5	48.8	24.7	24.7	42.2	12.9	18.7
LnGrp LOS	D	A	D	D	C	D	D	C	C	D	B	B
Approach Vol, veh/h		336			453			1196			865	
Approach Delay, s/veh		42.8			37.1			26.5			23.1	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.8	37.9	12.1	17.8	10.0	43.7	10.7	19.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	19.5	48.5	13.5	20.5	12.9	55.1	13.7	20.3
Max Q Clear Time (g_c+I1), s	11.1	25.1	7.9	12.5	6.2	23.6	6.7	11.5
Green Ext Time (p_c), s	0.3	8.2	0.1	0.8	0.1	3.0	0.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	403	1034	1087	98	1549	304
v/c Ratio	0.30	0.88	0.59	0.11	0.84	0.19
Control Delay	26.2	39.9	21.7	3.3	30.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	39.9	21.7	3.3	30.2	0.3
Queue Length 50th (ft)	114	396	313	0	553	0
Queue Length 95th (ft)	167	551	410	28	709	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1681	1429	2285	1056	2285	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.72	0.48	0.09	0.68	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	371	0	951	0	1000	90	0	1425	280
Future Volume (vph)	0	0	0	371	0	951	0	1000	90	0	1425	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.5		4.5		4.5	4.5		4.5	4.0
Lane Util. Factor				0.97		0.88		0.95	1.00		0.95	1.00
Frt				1.00		0.85		1.00	0.85		1.00	0.85
Flt Protected				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)				3400		2760		3505	1568		3505	1568
Flt Permitted				0.95		1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)				3400		2760		3505	1568		3505	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	403	0	1034	0	1087	98	0	1549	304
RTOR Reduction (vph)	0	0	0	0	0	76	0	0	47	0	0	0
Lane Group Flow (vph)	0	0	0	403	0	958	0	1087	51	0	1549	304
Turn Type				Prot		Prot		NA	Perm		NA	Free
Protected Phases				8		8		2			6	
Permitted Phases									2			Free
Actuated Green, G (s)				47.4		47.4		62.4	62.4		62.4	118.8
Effective Green, g (s)				47.4		47.4		62.4	62.4		62.4	118.8
Actuated g/C Ratio				0.40		0.40		0.53	0.53		0.53	1.00
Clearance Time (s)				4.5		4.5		4.5	4.5		4.5	
Vehicle Extension (s)				3.0		3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)				1356		1101		1841	823		1841	1568
v/s Ratio Prot				0.12		c0.35		0.31			c0.44	
v/s Ratio Perm									0.03			0.19
v/c Ratio				0.30		0.87		0.59	0.06		0.84	0.19
Uniform Delay, d1				24.3		32.9		19.4	13.8		24.0	0.0
Progression Factor				1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2				0.1		7.7		0.5	0.0		3.7	0.3
Delay (s)				24.5		40.6		19.9	13.9		27.7	0.3
Level of Service				C		D		B	B		C	A
Approach Delay (s)		0.0			36.0			19.4			23.2	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	118.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	371	0	951	0	1000	90	0	1425	280
Future Volume (veh/h)	0	0	0	371	0	951	0	1000	90	0	1425	280
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				403	0	1034	0	1087	98	0	1549	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1411	0	1139	0	1807	806	0	1807	
Arrive On Green				0.41	0.00	0.41	0.00	0.51	0.51	0.00	0.51	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				403	0	1034	0	1087	98	0	1549	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				9.3	0.0	41.7	0.0	25.8	3.8	0.0	45.4	0.0
Cycle Q Clear(g_c), s				9.3	0.0	41.7	0.0	25.8	3.8	0.0	45.4	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1411	0	1139	0	1807	806	0	1807	
V/C Ratio(X)				0.29	0.00	0.91	0.00	0.60	0.12	0.00	0.86	
Avail Cap(c_a), veh/h				1630	0	1316	0	2210	986	0	2210	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				23.3	0.0	32.8	0.0	20.4	15.0	0.0	25.2	0.0
Incr Delay (d2), s/veh				0.1	0.0	8.6	0.0	0.3	0.1	0.0	3.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.7	0.0	14.6	0.0	10.1	1.3	0.0	18.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.4	0.0	41.4	0.0	20.7	15.1	0.0	28.2	0.0
LnGrp LOS				C	A	D	A	C	B	A	C	
Approach Vol, veh/h					1437			1185			1549	
Approach Delay, s/veh					36.4			20.3			28.2	
Approach LOS					D			C			C	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		65.4				65.4		53.4				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		74.5				74.5		56.5				
Max Q Clear Time (g_c+I1), s		27.8				47.4		43.7				
Green Ext Time (p_c), s		10.0				13.5		5.2				

Intersection Summary			
HCM 6th Ctrl Delay			28.8
HCM 6th LOS			C

Notes
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	90	803	623	112	912	419	120	20	25	84
v/c Ratio	0.34	0.61	0.40	0.38	0.47	0.52	0.26	0.11	0.12	0.21
Control Delay	37.0	22.2	0.8	36.3	18.5	29.2	11.6	39.9	39.4	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	22.2	0.8	36.3	18.5	29.2	11.6	39.9	39.4	6.6
Queue Length 50th (ft)	32	128	0	40	93	74	7	7	9	0
Queue Length 95th (ft)	103	294	0	121	203	176	59	37	42	30
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	436	2278	1568	496	3376	1431	791	557	650	541
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.35	0.40	0.23	0.27	0.29	0.15	0.04	0.04	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	803	623	112	893	19	419	23	97	20	25	84
Future Volume (veh/h)	90	803	623	112	893	19	419	23	97	20	25	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	803	0	112	893	19	419	23	0	20	25	84
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	119	1183		147	1793	38	601	309		159	151	234
Arrive On Green	0.07	0.34	0.00	0.08	0.35	0.35	0.18	0.17	0.00	0.09	0.08	0.08
Sat Flow, veh/h	1767	3526	1572	1767	5105	109	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	90	803	0	112	590	322	419	23	0	20	25	84
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1836	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	2.8	10.9	0.0	3.4	7.6	7.6	6.4	0.6	0.0	0.6	0.7	2.7
Cycle Q Clear(g_c), s	2.8	10.9	0.0	3.4	7.6	7.6	6.4	0.6	0.0	0.6	0.7	2.7
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	1183		147	1186	645	601	309		159	151	234
V/C Ratio(X)	0.75	0.68		0.76	0.50	0.50	0.70	0.07		0.13	0.17	0.36
Avail Cap(c_a), veh/h	462	2573		525	2586	1406	1514	886		589	685	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	15.9	0.0	24.9	14.2	14.2	21.5	19.5	0.0	23.2	23.7	21.2
Incr Delay (d2), s/veh	9.2	0.7	0.0	7.9	0.3	0.6	1.5	0.1	0.0	0.4	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.7	0.0	1.6	2.4	2.7	2.5	0.2	0.0	0.2	0.3	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	16.6	0.0	32.8	14.5	14.8	23.0	19.6	0.0	23.6	24.2	22.1
LnGrp LOS	C	B		C	B	B	C	B		C	C	C
Approach Vol, veh/h		893			1024			442			129	
Approach Delay, s/veh		18.4			16.6			22.8			22.8	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	13.8	9.1	23.1	14.2	9.0	8.3	24.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	26.5	16.5	40.5	24.5	20.5	14.5	42.5
Max Q Clear Time (g_c+I1), s	2.6	2.6	5.4	12.9	8.4	4.7	4.8	9.6
Green Ext Time (p_c), s	0.0	0.1	0.2	5.7	1.4	0.3	0.1	6.4

Intersection Summary	
HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	28	601	352	23	765	318	9	2	5
v/c Ratio	0.10	0.38	0.39	0.08	0.53	0.37	0.01	0.01	0.01
Control Delay	25.3	10.2	3.1	25.8	13.3	18.7	0.0	28.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	10.2	3.1	25.8	13.3	18.7	0.0	28.0	0.0
Queue Length 50th (ft)	5	36	0	4	49	26	0	0	0
Queue Length 95th (ft)	36	156	50	32	206	107	0	7	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	424	3198	1461	380	3176	2127	1369	290	887
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.19	0.24	0.06	0.24	0.15	0.01	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	553	324	21	703	1	293	0	8	2	0	5
Future Volume (veh/h)	26	553	324	21	703	1	293	0	8	2	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	601	0	23	764	1	318	0	9	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	59	1241		50	1253	2	537	323	274	5	0	32
Arrive On Green	0.03	0.35	0.00	0.03	0.35	0.35	0.16	0.00	0.17	0.00	0.00	0.02
Sat Flow, veh/h	1767	3526	1572	1767	3613	5	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	28	601	0	23	373	392	318	0	9	2	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1855	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	0.6	5.4	0.0	0.5	7.1	7.1	3.5	0.0	0.2	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.6	5.4	0.0	0.5	7.1	7.1	3.5	0.0	0.2	0.0	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	1241		50	611	643	537	323	274	5	0	32
V/C Ratio(X)	0.48	0.48		0.46	0.61	0.61	0.59	0.00	0.03	0.41	0.00	0.16
Avail Cap(c_a), veh/h	413	4294		370	2104	2213	2067	1712	1451	283	0	755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	10.3	0.0	19.4	11.0	11.0	15.9	0.0	13.9	20.2	0.0	19.6
Incr Delay (d2), s/veh	5.8	0.3	0.0	6.6	1.0	0.9	1.0	0.0	0.0	47.6	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.5	0.0	0.3	2.1	2.2	1.2	0.0	0.1	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	10.6	0.0	26.0	12.0	11.9	17.0	0.0	14.0	67.8	0.0	21.8
LnGrp LOS	C	B		C	B	B	B	A	B	E	A	C
Approach Vol, veh/h		629			788			327			7	
Approach Delay, s/veh		11.2			12.4			16.9			35.0	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	11.6	5.6	18.8	10.9	5.3	5.9	18.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	37.5	8.5	49.5	24.5	19.5	9.5	48.5
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.5	7.4	5.5	2.1	2.6	9.1
Green Ext Time (p_c), s	0.0	0.0	0.0	4.3	1.0	0.0	0.0	5.0

Intersection Summary	
HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	467	104	13	462	303	65
v/c Ratio	0.38	0.17	0.04	0.33	0.31	0.13
Control Delay	9.4	3.6	14.6	6.8	11.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	3.6	14.6	6.8	11.0	5.0
Queue Length 50th (ft)	22	0	1	22	15	0
Queue Length 95th (ft)	83	24	15	47	63	22
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3502	1567	1244	3505	3244	1499
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.07	0.01	0.13	0.09	0.04

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	430	96	12	425	279	60
Future Volume (veh/h)	430	96	12	425	279	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	467	104	13	462	303	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	974	434	261	1969	590	271
Arrive On Green	0.28	0.28	0.15	0.56	0.17	0.17
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	467	104	13	462	303	65
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	3.7	1.7	0.2	2.2	2.7	1.2
Cycle Q Clear(g_c), s	3.7	1.7	0.2	2.2	2.7	1.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	974	434	261	1969	590	271
V/C Ratio(X)	0.48	0.24	0.05	0.23	0.51	0.24
Avail Cap(c_a), veh/h	5116	2282	1084	7753	3847	1764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	9.4	12.2	3.7	12.6	11.9
Incr Delay (d2), s/veh	0.4	0.3	0.1	0.1	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.4	0.1	0.2	0.8	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.5	9.7	12.3	3.8	13.3	12.4
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	571			475	368	
Approach Delay, s/veh	10.3			4.0	13.1	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.3	9.4	13.7				23.2
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		37.5	20.5	48.5				73.5
Max Q Clear Time (g_c+I1), s		4.7	2.2	5.7				4.2
Green Ext Time (p_c), s		1.3	0.0	3.5				3.2

Intersection Summary			
HCM 6th Ctrl Delay			8.9
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	456	68	605	16	2	25	71	26
v/c Ratio	0.05	0.22	0.13	0.24	0.01	0.00	0.05	0.12	0.05
Control Delay	17.9	10.0	16.1	6.0	0.4	15.0	9.1	15.1	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	10.0	16.1	6.0	0.4	15.0	9.1	15.1	8.4
Queue Length 50th (ft)	5	43	13	28	0	0	1	13	0
Queue Length 95th (ft)	23	85	45	105	2	5	16	45	15
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	1042	3483	1234	3505	1568	1575	1370	1575	1351
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.13	0.06	0.17	0.01	0.00	0.02	0.05	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	415	5	63	557	15	2	3	20	65	1	23
Future Volume (veh/h)	22	415	5	63	557	15	2	3	20	65	1	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	24	451	5	68	605	16	2	3	22	71	1	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1189	13	130	1325	591	389	21	156	390	7	168
Arrive On Green	0.03	0.33	0.33	0.07	0.38	0.38	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3572	40	1767	3526	1572	1374	192	1410	1375	61	1521
Grp Volume(v), veh/h	24	222	234	68	605	16	2	0	25	71	0	26
Grp Sat Flow(s),veh/h/ln	1767	1763	1848	1767	1763	1572	1374	0	1602	1375	0	1582
Q Serve(g_s), s	0.4	2.7	2.7	1.0	3.6	0.2	0.0	0.0	0.4	1.4	0.0	0.4
Cycle Q Clear(g_c), s	0.4	2.7	2.7	1.0	3.6	0.2	0.5	0.0	0.4	1.8	0.0	0.4
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	54	587	615	130	1325	591	389	0	177	390	0	175
V/C Ratio(X)	0.45	0.38	0.38	0.52	0.46	0.03	0.01	0.00	0.14	0.18	0.00	0.15
Avail Cap(c_a), veh/h	917	3186	3341	1423	7382	3293	1884	0	1921	1887	0	1897
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.3	7.1	7.1	12.5	6.6	5.5	11.4	0.0	11.2	12.0	0.0	11.2
Incr Delay (d2), s/veh	5.7	0.4	0.4	3.3	0.2	0.0	0.0	0.0	0.4	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.6	0.7	0.4	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	7.5	7.5	15.7	6.8	5.5	11.4	0.0	11.6	12.2	0.0	11.6
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		480			689			27			97	
Approach Delay, s/veh		8.1			7.7			11.6			12.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		7.6	6.6	13.8		7.6	5.3	15.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.5	22.5	50.5		33.5	14.5	58.5
Max Q Clear Time (g_c+I1), s		2.5	3.0	4.7		3.8	2.4	5.6
Green Ext Time (p_c), s		0.1	0.1	3.0		0.3	0.0	4.9

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	300	213	402	28	23	99	58	14	20
v/c Ratio	0.17	0.38	0.46	0.23	0.11	0.09	0.29	0.20	0.04	0.05
Control Delay	25.6	20.5	22.3	12.3	26.3	26.4	5.5	25.3	23.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	20.5	22.3	12.3	26.3	26.4	5.5	25.3	23.2	0.2
Queue Length 50th (ft)	14	44	61	47	8	7	0	17	3	0
Queue Length 95th (ft)	45	91	135	91	33	29	24	53	20	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	514	1901	1206	2800	801	1076	971	842	1104	993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.16	0.18	0.14	0.03	0.02	0.10	0.07	0.01	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	241	35	196	271	98	26	21	91	53	13	18
Future Volume (veh/h)	42	241	35	196	271	98	26	21	91	53	13	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	262	38	213	295	107	28	23	99	58	14	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	88	516	74	288	713	253	198	247	209	162	209	177
Arrive On Green	0.05	0.17	0.17	0.16	0.28	0.28	0.11	0.13	0.13	0.09	0.11	0.11
Sat Flow, veh/h	1767	3095	444	1767	2550	906	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	46	148	152	213	202	200	28	23	99	58	14	20
Grp Sat Flow(s),veh/h/ln	1767	1763	1776	1767	1763	1693	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	1.0	3.1	3.2	4.6	3.8	3.9	0.6	0.4	2.4	1.2	0.3	0.5
Cycle Q Clear(g_c), s	1.0	3.1	3.2	4.6	3.8	3.9	0.6	0.4	2.4	1.2	0.3	0.5
Prop In Lane	1.00		0.25	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	88	294	296	288	493	473	198	247	209	162	209	177
V/C Ratio(X)	0.52	0.50	0.51	0.74	0.41	0.42	0.14	0.09	0.47	0.36	0.07	0.11
Avail Cap(c_a), veh/h	547	1026	1034	1423	1900	1824	854	1172	993	898	1218	1032
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	15.3	15.3	16.1	11.8	11.9	16.2	15.4	16.2	17.2	16.0	16.1
Incr Delay (d2), s/veh	4.7	1.3	1.4	3.7	0.5	0.6	0.3	0.2	1.7	1.3	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.2	1.2	1.9	1.3	1.3	0.2	0.2	0.8	0.5	0.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	16.6	16.7	19.8	12.4	12.5	16.5	15.5	17.9	18.6	16.1	16.4
LnGrp LOS	C	B	B	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		346			615			150			92	
Approach Delay, s/veh		17.6			15.0			17.2			17.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	9.9	11.1	11.2	9.0	9.0	6.5	15.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	32.5	23.5	19.5	26.5	12.5	43.5
Max Q Clear Time (g_c+I1), s	3.2	4.4	6.6	5.2	2.6	2.5	3.0	5.9
Green Ext Time (p_c), s	0.1	0.4	0.6	1.6	0.0	0.1	0.0	2.7

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	139	19	666	55	300
v/c Ratio	0.16	0.05	0.37	0.13	0.13
Control Delay	15.4	9.6	7.9	16.7	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	9.6	7.9	16.7	3.9
Queue Length 50th (ft)	9	0	25	7	12
Queue Length 95th (ft)	38	15	102	39	25
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	2752	1157	3326	1097	3505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.20	0.05	0.09

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	126	19	406	207	51	276
Future Volume (veh/h)	126	19	406	207	51	276
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	137	21	441	225	55	300
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	426	190	859	434	108	2067
Arrive On Green	0.12	0.12	0.38	0.38	0.06	0.59
Sat Flow, veh/h	3534	1572	2359	1146	1767	3618
Grp Volume(v), veh/h	137	21	342	324	55	300
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1649	1767	1763
Q Serve(g_s), s	1.1	0.4	4.6	4.7	0.9	1.2
Cycle Q Clear(g_c), s	1.1	0.4	4.6	4.7	0.9	1.2
Prop In Lane	1.00	1.00		0.69	1.00	
Lane Grp Cap(c), veh/h	426	190	668	625	108	2067
V/C Ratio(X)	0.32	0.11	0.51	0.52	0.51	0.15
Avail Cap(c_a), veh/h	3050	1357	3473	3249	1122	9701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	12.0	7.4	7.4	14.0	2.9
Incr Delay (d2), s/veh	0.4	0.3	0.6	0.7	3.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	1.1	1.1	0.4	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	12.3	8.0	8.0	17.7	2.9
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	158		666			355
Approach Delay, s/veh	12.7		8.0			5.2
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.4	16.1				22.5		8.2
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	19.5	60.5				84.5		26.5
Max Q Clear Time (g_c+I1), s	2.9	6.7				3.2		3.1
Green Ext Time (p_c), s	0.1	5.0				2.2		0.5

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	145	104	312	123	56
v/c Ratio	0.28	0.05	0.33	0.15	0.15
Control Delay	13.7	3.7	6.5	12.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	3.7	6.5	12.6	6.5
Queue Length 50th (ft)	23	3	9	9	0
Queue Length 95th (ft)	62	10	35	26	21
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1720	3505	3022	3029	1291
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.03	0.10	0.04	0.04

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	133	96	100	187	98	66		
Future Volume (veh/h)	133	96	100	187	98	66		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	145	104	109	203	119	60		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	216	1887	438	391	480	214		
Arrive On Green	0.12	0.54	0.25	0.25	0.14	0.14		
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572		
Grp Volume(v), veh/h	145	104	109	203	119	60		
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572		
Q Serve(g_s), s	2.1	0.4	1.4	3.0	0.8	0.9		
Cycle Q Clear(g_c), s	2.1	0.4	1.4	3.0	0.8	0.9		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	216	1887	438	391	480	214		
V/C Ratio(X)	0.67	0.06	0.25	0.52	0.25	0.28		
Avail Cap(c_a), veh/h	2487	10116	2287	2040	4199	1868		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	11.5	3.0	8.2	8.9	10.6	10.6		
Incr Delay (d2), s/veh	3.6	0.0	0.3	1.1	0.3	0.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.4	0.8	0.2	0.9		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	15.1	3.1	8.5	9.9	10.8	11.3		
LnGrp LOS	B	A	A	A	B	B		
Approach Vol, veh/h		249	312		179			
Approach Delay, s/veh		10.1	9.4		11.0			
Approach LOS		B	A		B			
Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				19.1		8.2	7.8	11.3
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				78.5		32.5	38.5	35.5
Max Q Clear Time (g_c+I1), s				2.4		2.9	4.1	5.0
Green Ext Time (p_c), s				0.7		0.6	0.4	2.1
Intersection Summary								
HCM 6th Ctrl Delay			10.0					
HCM 6th LOS			B					

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	8	140	4	33	237	275	10	367
v/c Ratio	0.11	0.02	0.34	0.02	0.13	0.47	0.12	0.04	0.42
Control Delay	25.5	21.7	8.0	27.0	15.9	20.8	7.3	26.4	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	21.7	8.0	27.0	15.9	20.8	7.3	26.4	18.8
Queue Length 50th (ft)	7	2	0	1	2	47	9	2	37
Queue Length 95th (ft)	35	14	45	10	27	148	61	17	107
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	400	1120	1006	315	933	1399	3406	315	2413
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.01	0.14	0.01	0.04	0.17	0.08	0.03	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	7	129	4	7	23	218	248	5	9	288	50
Future Volume (veh/h)	28	7	129	4	7	23	218	248	5	9	288	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	30	8	140	4	8	25	237	270	5	10	313	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	63	264	224	10	44	139	320	1306	24	23	605	103
Arrive On Green	0.04	0.14	0.14	0.01	0.11	0.11	0.18	0.37	0.37	0.01	0.20	0.20
Sat Flow, veh/h	1767	1856	1572	1767	396	1237	1767	3541	65	1767	3012	514
Grp Volume(v), veh/h	30	8	140	4	0	33	237	134	141	10	182	185
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1633	1767	1763	1844	1767	1763	1763
Q Serve(g_s), s	0.6	0.1	3.2	0.1	0.0	0.7	4.9	2.0	2.0	0.2	3.5	3.6
Cycle Q Clear(g_c), s	0.6	0.1	3.2	0.1	0.0	0.7	4.9	2.0	2.0	0.2	3.5	3.6
Prop In Lane	1.00		1.00	1.00		0.76	1.00		0.04	1.00		0.29
Lane Grp Cap(c), veh/h	63	264	224	10	0	183	320	650	680	23	354	354
V/C Ratio(X)	0.48	0.03	0.62	0.42	0.00	0.18	0.74	0.21	0.21	0.43	0.51	0.52
Avail Cap(c_a), veh/h	438	1235	1047	346	0	1002	1730	2830	2960	346	1450	1450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	14.1	15.5	19.0	0.0	15.4	14.8	8.3	8.3	18.8	13.6	13.7
Incr Delay (d2), s/veh	5.5	0.0	2.8	26.2	0.0	0.5	3.4	0.2	0.1	12.0	1.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	1.1	0.1	0.0	0.2	1.8	0.5	0.6	0.2	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	14.2	18.3	45.2	0.0	15.9	18.2	8.4	8.4	30.8	14.8	14.9
LnGrp LOS	C	B	B	D	A	B	B	A	A	C	B	B
Approach Vol, veh/h		178			37			512			377	
Approach Delay, s/veh		19.0			19.0			12.9			15.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.0	18.6	4.7	10.0	11.4	12.2	5.9	8.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	61.5	7.5	25.5	37.5	31.5	9.5	23.5
Max Q Clear Time (g_c+I1), s	2.2	4.0	2.1	5.2	6.9	5.6	2.6	2.7
Green Ext Time (p_c), s	0.0	1.6	0.0	0.4	0.7	2.1	0.0	0.1

Intersection Summary		
HCM 6th Ctrl Delay		14.9
HCM 6th LOS		B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	161	870	141	326	527	354	196	353
v/c Ratio	0.67	0.90	0.78	0.41	0.90	0.33	0.71	0.69
Control Delay	60.6	45.7	78.0	38.5	55.1	28.9	59.1	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	45.7	78.0	38.5	55.1	28.9	59.1	42.4
Queue Length 50th (ft)	114	274	103	104	355	96	139	101
Queue Length 95th (ft)	189	#421	#223	163	#584	146	218	153
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	311	1014	187	790	660	1224	375	699
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.86	0.75	0.41	0.80	0.29	0.52	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	446	354	130	257	43	485	277	49	180	206	119
Future Volume (veh/h)	148	446	354	130	257	43	485	277	49	180	206	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	161	485	0	141	279	0	527	301	0	196	224	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	205	702		179	650		592	1061		246	370	
Arrive On Green	0.12	0.20	0.00	0.10	0.18	0.00	0.34	0.30	0.00	0.14	0.10	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	161	485	0	141	279	0	527	301	0	196	224	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	6.1	8.9	0.0	5.4	4.9	0.0	19.6	4.5	0.0	7.4	4.2	0.0
Cycle Q Clear(g_c), s	6.1	8.9	0.0	5.4	4.9	0.0	19.6	4.5	0.0	7.4	4.2	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	205	702		179	650		592	1061		246	370	
V/C Ratio(X)	0.78	0.69		0.79	0.43		0.89	0.28		0.80	0.61	
Avail Cap(c_a), veh/h	487	1500		293	1113		1032	1932		586	1042	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.8	25.8	0.0	30.4	25.1	0.0	21.8	18.5	0.0	28.9	29.7	0.0
Incr Delay (d2), s/veh	6.4	1.2	0.0	7.5	0.4	0.0	5.2	0.1	0.0	5.8	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.6	0.0	2.5	2.0	0.0	8.1	1.7	0.0	3.4	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	27.0	0.0	37.9	25.5	0.0	27.0	18.7	0.0	34.7	31.3	0.0
LnGrp LOS	D	C		D	C		C	B		C	C	
Approach Vol, veh/h		646			420			828			420	
Approach Delay, s/veh		29.3			29.7			24.0			32.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	25.4	11.5	18.3	27.7	11.8	12.6	17.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.0	38.0	11.5	29.5	40.5	20.5	19.1	21.9
Max Q Clear Time (g_c+I1), s	9.4	6.5	7.4	10.9	21.6	6.2	8.1	6.9
Green Ext Time (p_c), s	0.4	2.0	0.1	3.0	1.6	1.1	0.3	1.4

Intersection Summary		
HCM 6th Ctrl Delay		28.1
HCM 6th LOS		C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	743	438	493	338	533
v/c Ratio	0.77	0.81	0.22	0.73	0.66
Control Delay	36.6	44.0	8.0	44.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	44.0	8.0	44.1	7.4
Queue Length 50th (ft)	198	245	60	190	0
Queue Length 95th (ft)	335	425	104	338	90
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	1237	806	2849	686	938
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.54	0.17	0.49	0.57

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	455	228	403	454	311	490
Future Volume (veh/h)	455	228	403	454	311	490
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	495	248	438	493	338	533
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	584	291	480	2017	600	534
Arrive On Green	0.26	0.26	0.27	0.57	0.34	0.34
Sat Flow, veh/h	2371	1136	1767	3618	1767	1572
Grp Volume(v), veh/h	383	360	438	493	338	533
Grp Sat Flow(s),veh/h/ln	1763	1651	1767	1763	1767	1572
Q Serve(g_s), s	21.0	21.1	24.4	7.1	15.9	34.4
Cycle Q Clear(g_c), s	21.0	21.1	24.4	7.1	15.9	34.4
Prop In Lane		0.69	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	452	423	480	2017	600	534
V/C Ratio(X)	0.85	0.85	0.91	0.24	0.56	1.00
Avail Cap(c_a), veh/h	546	512	704	2653	600	534
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	36.0	35.9	10.8	27.4	33.6
Incr Delay (d2), s/veh	10.1	11.2	12.2	0.1	1.2	38.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	9.6	11.8	2.6	6.8	18.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.1	47.2	48.1	10.9	28.7	72.2
LnGrp LOS	D	D	D	B	C	E
Approach Vol, veh/h	743			931	871	
Approach Delay, s/veh	46.6			28.4	55.3	
Approach LOS	D			C	E	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	39.0	32.1	30.6	62.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	34.5	40.5	31.5	76.5
Max Q Clear Time (g_c+I1), s	36.4	26.4	23.1	9.1
Green Ext Time (p_c), s	0.0	1.2	2.9	3.6

Intersection Summary	
HCM 6th Ctrl Delay	42.9
HCM 6th LOS	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	25	796	96	759	140	97
v/c Ratio	0.11	0.58	0.31	0.42	0.44	0.15
Control Delay	28.5	15.9	27.0	10.2	26.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	15.9	27.0	10.2	26.5	0.5
Queue Length 50th (ft)	7	102	28	51	39	0
Queue Length 95th (ft)	33	199	82	167	108	0
Internal Link Dist (ft)		424		851		1161
Turn Bay Length (ft)	125		125		75	
Base Capacity (vph)	341	3079	700	3375	938	1170
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.14	0.22	0.15	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	617	115	88	697	1	129	0	89	0	0	0
Future Volume (veh/h)	23	617	115	88	697	1	129	0	89	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	671	125	96	758	1	140	0	97	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	1168	217	152	1621	2	453	0	223	202	264	0
Arrive On Green	0.03	0.39	0.39	0.09	0.45	0.45	0.14	0.00	0.14	0.00	0.00	0.00
Sat Flow, veh/h	1767	2967	552	1767	3613	5	1767	0	1572	1288	1856	0
Grp Volume(v), veh/h	25	398	398	96	370	389	140	0	97	0	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1756	1767	1763	1855	1767	0	1572	1288	1856	0
Q Serve(g_s), s	0.5	6.3	6.3	1.9	5.2	5.2	2.6	0.0	2.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	6.3	6.3	1.9	5.2	5.2	2.6	0.0	2.0	0.0	0.0	0.0
Prop In Lane	1.00		0.31	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	54	694	691	152	791	832	453	0	223	202	264	0
V/C Ratio(X)	0.46	0.57	0.58	0.63	0.47	0.47	0.31	0.00	0.43	0.00	0.00	0.00
Avail Cap(c_a), veh/h	470	2593	2584	966	3087	3248	1910	0	1520	1264	1794	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	17.0	8.5	8.5	15.8	6.9	6.9	14.3	0.0	14.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.9	0.8	0.8	4.3	0.4	0.4	0.4	0.0	1.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.6	1.6	0.8	1.2	1.3	0.9	0.0	0.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.0	9.2	9.2	20.0	7.3	7.3	14.6	0.0	15.3	0.0	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	B	A	A	A
Approach Vol, veh/h		821			855			237			0	
Approach Delay, s/veh		9.7			8.7			14.9			0.0	
Approach LOS		A			A			B				
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.6	7.6	18.5		9.6	5.6	20.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		34.5	19.5	52.5		34.5	9.5	62.5				
Max Q Clear Time (g_c+I1), s		4.6	3.9	8.3		0.0	2.5	7.2				
Green Ext Time (p_c), s		1.0	0.2	5.7		0.0	0.0	5.3				
Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	451	480	646	233	97	1112
v/c Ratio	0.57	0.26	0.75	0.42	0.07	0.59
Control Delay	42.4	15.5	45.6	6.6	22.4	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.2
Total Delay	42.4	15.5	45.6	6.6	22.4	13.3
Queue Length 50th (ft)	151	98	230	0	22	206
Queue Length 95th (ft)	218	130	295	60	43	318
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	796	2028	1068	639	1367	1896
Starvation Cap Reductn	0	0	0	0	0	614
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.24	0.60	0.36	0.07	0.87

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	406	432	581	210	87	1001
Future Volume (veh/h)	406	432	581	210	87	1001
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	451	480	646	233	97	1112
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	819	1794	808	361	1406	1796
Arrive On Green	0.24	0.51	0.23	0.23	0.41	0.41
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768
Grp Volume(v), veh/h	451	480	646	233	97	1112
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384
Q Serve(g_s), s	12.8	8.6	19.2	14.9	1.9	26.2
Cycle Q Clear(g_c), s	12.8	8.6	19.2	14.9	1.9	26.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	819	1794	808	361	1406	1796
V/C Ratio(X)	0.55	0.27	0.80	0.65	0.07	0.62
Avail Cap(c_a), veh/h	819	2082	1096	489	1406	1796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	15.5	40.3	38.7	19.9	11.4
Incr Delay (d2), s/veh	2.7	0.1	3.1	1.9	0.1	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	3.4	8.5	0.2	0.8	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.7	15.6	43.4	40.6	20.0	13.0
LnGrp LOS	D	B	D	D	B	B
Approach Vol, veh/h		931	879		1209	
Approach Delay, s/veh		27.2	42.7		13.6	
Approach LOS		C	D		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				60.9		50.0	31.0	29.9
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				65.5		45.5	26.5	34.5
Max Q Clear Time (g_c+I1), s				10.6		28.2	14.8	21.2
Green Ext Time (p_c), s				3.5		5.4	1.3	4.3

Intersection Summary	
HCM 6th Ctrl Delay	26.3
HCM 6th LOS	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	96	654	1139	218	146	187
v/c Ratio	0.73	0.27	0.81	0.35	0.09	0.24
Control Delay	92.6	20.4	39.3	28.0	22.2	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.6	20.4	39.3	28.0	22.2	10.8
Queue Length 50th (ft)	41	117	438	125	35	34
Queue Length 95th (ft)	#100	143	519	187	68	99
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	132	3237	1993	891	1549	776
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.20	0.57	0.24	0.09	0.24

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	589	1025	196	131	168
Future Volume (veh/h)	86	589	1025	196	131	168
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	96	654	1139	218	146	187
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	135	2372	1387	619	1580	725
Arrive On Green	0.04	0.47	0.39	0.39	0.46	0.46
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	96	654	1139	218	146	187
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	3.5	10.0	36.7	12.4	3.0	9.2
Cycle Q Clear(g_c), s	3.5	10.0	36.7	12.4	3.0	9.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	135	2372	1387	619	1580	725
V/C Ratio(X)	0.71	0.28	0.82	0.35	0.09	0.26
Avail Cap(c_a), veh/h	135	3292	2027	904	1580	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.3	20.6	34.5	27.1	19.3	20.9
Incr Delay (d2), s/veh	27.1	0.1	1.8	0.3	0.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.9	15.7	4.7	1.3	10.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	87.4	20.7	36.3	27.5	19.4	21.8
LnGrp LOS	F	C	D	C	B	C
Approach Vol, veh/h		750	1357		333	
Approach Delay, s/veh		29.2	34.9		20.7	
Approach LOS		C	C		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		64.0		63.0	9.5	54.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		12.0		11.2	5.5	38.7
Green Ext Time (p_c), s		5.1		1.2	0.0	11.2

Intersection Summary			
HCM 6th Ctrl Delay			31.2
HCM 6th LOS			C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	88	413	98	221	284
v/c Ratio	0.13	0.26	0.42	0.19	0.45	0.11
Control Delay	19.7	8.2	15.0	5.0	17.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	8.2	15.0	5.0	17.5	3.0
Queue Length 50th (ft)	8	0	43	0	44	11
Queue Length 95th (ft)	34	32	88	26	110	22
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1141	1051	3088	1393	1632	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.08	0.13	0.07	0.14	0.08

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	81	380	90	203	261
Future Volume (veh/h)	37	81	380	90	203	261
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	88	413	98	221	284
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	190	169	917	409	348	2123
Arrive On Green	0.11	0.11	0.26	0.26	0.20	0.60
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	40	88	413	98	221	284
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	0.6	1.6	3.0	1.5	3.6	1.1
Cycle Q Clear(g_c), s	0.6	1.6	3.0	1.5	3.6	1.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	190	169	917	409	348	2123
V/C Ratio(X)	0.21	0.52	0.45	0.24	0.63	0.13
Avail Cap(c_a), veh/h	1453	1293	4375	1951	2421	9716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.6	13.1	9.6	9.1	11.4	2.7
Incr Delay (d2), s/veh	0.5	2.5	0.3	0.3	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.7	0.3	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.2	15.5	10.0	9.4	13.4	2.7
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	128		511			505
Approach Delay, s/veh	14.8		9.8			7.4
Approach LOS	B		A			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.6	12.6				23.2		7.8
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	42.5	38.5				85.5		25.5
Max Q Clear Time (g_c+I1), s	5.6	5.0				3.1		3.6
Green Ext Time (p_c), s	0.6	3.0				1.9		0.3

Intersection Summary			
HCM 6th Ctrl Delay			9.3
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	70	108	170	168	113	43	365	103	140	613
v/c Ratio	0.26	0.34	0.44	0.39	0.24	0.18	0.44	0.33	0.24	0.67
Control Delay	30.8	28.6	28.8	26.2	5.0	31.8	23.4	30.1	20.9	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	28.6	28.8	26.2	5.0	31.8	23.4	30.1	20.9	6.5
Queue Length 50th (ft)	24	33	56	54	0	15	60	34	42	0
Queue Length 95th (ft)	73	95	138	130	29	53	123	95	100	81
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	408	713	799	1061	959	302	2569	550	1538	1409
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.15	0.21	0.16	0.12	0.14	0.14	0.19	0.09	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	81	18	156	155	104	40	289	47	95	129	564
Future Volume (veh/h)	64	81	18	156	155	104	40	289	47	95	129	564
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	88	20	170	168	113	43	314	51	103	140	613
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	141	32	220	305	259	75	1246	200	135	823	698
Arrive On Green	0.06	0.10	0.10	0.12	0.16	0.16	0.04	0.41	0.41	0.08	0.44	0.44
Sat Flow, veh/h	1767	1463	333	1767	1856	1572	1767	3042	489	1767	1856	1572
Grp Volume(v), veh/h	70	0	108	170	168	113	43	181	184	103	140	613
Grp Sat Flow(s),veh/h/ln	1767	0	1796	1767	1856	1572	1767	1763	1768	1767	1856	1572
Q Serve(g_s), s	2.4	0.0	3.6	5.7	5.1	4.0	1.5	4.1	4.2	3.5	2.8	21.9
Cycle Q Clear(g_c), s	2.4	0.0	3.6	5.7	5.1	4.0	1.5	4.1	4.2	3.5	2.8	21.9
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	100	0	174	220	305	259	75	722	724	135	823	698
V/C Ratio(X)	0.70	0.00	0.62	0.77	0.55	0.44	0.58	0.25	0.25	0.76	0.17	0.88
Avail Cap(c_a), veh/h	330	0	569	646	920	780	244	1275	1279	445	1554	1317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	26.7	26.1	23.6	23.1	28.9	11.9	12.0	27.9	10.3	15.6
Incr Delay (d2), s/veh	8.5	0.0	3.6	5.7	1.5	1.2	6.8	0.2	0.2	8.6	0.1	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.6	2.6	2.2	1.5	0.7	1.5	1.5	1.7	1.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	0.0	30.3	31.7	25.1	24.3	35.7	12.1	12.1	36.5	10.4	19.4
LnGrp LOS	D	A	C	C	C	C	D	B	B	D	B	B
Approach Vol, veh/h		178			451			408			856	
Approach Delay, s/veh		32.9			27.4			14.6			20.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	29.7	12.2	10.4	7.1	31.8	8.0	14.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	44.5	22.5	19.5	8.5	51.5	11.5	30.5
Max Q Clear Time (g_c+I1), s	5.5	6.2	7.7	5.6	3.5	23.9	4.4	7.1
Green Ext Time (p_c), s	0.2	2.3	0.4	0.4	0.0	3.4	0.1	1.3

Intersection Summary	
HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	480	1016	636	40	1701	235
v/c Ratio	0.44	0.84	0.31	0.04	0.82	0.15
Control Delay	31.8	25.8	11.9	3.5	22.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	25.8	11.9	3.5	22.3	0.2
Queue Length 50th (ft)	133	206	106	0	453	0
Queue Length 95th (ft)	224	376	179	16	716	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1636	1576	2769	1247	2769	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.64	0.23	0.03	0.61	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	442	0	935	0	585	37	0	1565	216
Future Volume (veh/h)	0	0	0	442	0	935	0	585	37	0	1565	216
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				480	0	1016	0	636	40	0	1701	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1282	0	1035	0	1957	873	0	1957	
Arrive On Green				0.37	0.00	0.37	0.00	0.56	0.56	0.00	0.56	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				480	0	1016	0	636	40	0	1701	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				12.9	0.0	46.1	0.0	12.4	1.5	0.0	52.7	0.0
Cycle Q Clear(g_c), s				12.9	0.0	46.1	0.0	12.4	1.5	0.0	52.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1282	0	1035	0	1957	873	0	1957	
V/C Ratio(X)				0.37	0.00	0.98	0.00	0.32	0.05	0.00	0.87	
Avail Cap(c_a), veh/h				1282	0	1035	0	2318	1034	0	2318	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				28.9	0.0	39.3	0.0	15.3	12.9	0.0	24.3	0.0
Incr Delay (d2), s/veh				0.2	0.0	23.5	0.0	0.1	0.0	0.0	3.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.3	0.0	18.4	0.0	4.8	0.5	0.0	21.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.1	0.0	62.8	0.0	15.4	12.9	0.0	27.6	0.0
LnGrp LOS				C	A	E	A	B	B	A	C	
Approach Vol, veh/h					1496			676			1701	
Approach Delay, s/veh					52.0			15.3			27.6	
Approach LOS					D			B			C	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		75.0				75.0		52.0				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		83.5				83.5		47.5				
Max Q Clear Time (g_c+I1), s		14.4				54.7		48.1				
Green Ext Time (p_c), s		4.8				15.8		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	34.9
HCM 6th LOS	C

Notes
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	173	745	1093	173	838	1321	308	37	44	151
v/c Ratio	0.82	0.89	0.70	0.86	0.72	0.91	0.36	0.29	0.32	0.37
Control Delay	77.7	54.7	2.6	84.2	42.4	40.8	5.5	54.1	54.2	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.7	54.7	2.6	84.2	42.4	40.8	5.5	54.1	54.2	16.8
Queue Length 50th (ft)	120	268	0	121	199	446	18	25	30	32
Queue Length 95th (ft)	#248	#395	0	#255	256	#622	76	59	66	87
Internal Link Dist (ft)		1084			414		644		771	
Turn Bay Length (ft)	230			215		425		100		
Base Capacity (vph)	210	834	1568	201	1168	1445	870	294	322	413
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.89	0.70	0.86	0.72	0.91	0.35	0.13	0.14	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	745	1093	173	801	37	1321	43	265	37	44	151
Future Volume (veh/h)	173	745	1093	173	801	37	1321	43	265	37	44	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	173	745	0	173	801	37	1321	43	0	37	44	151
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	201	797		193	1101	51	1373	854		79	193	342
Arrive On Green	0.11	0.23	0.00	0.11	0.22	0.22	0.40	0.46	0.00	0.04	0.10	0.10
Sat Flow, veh/h	1767	3526	1572	1767	4963	229	3428	1856	0	1767	1856	1572
Grp Volume(v), veh/h	173	745	0	173	544	294	1321	43	0	37	44	151
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1689	1814	1714	1856	0	1767	1856	1572
Q Serve(g_s), s	10.8	23.3	0.0	10.9	16.8	16.9	42.3	1.4	0.0	2.3	2.4	9.3
Cycle Q Clear(g_c), s	10.8	23.3	0.0	10.9	16.8	16.9	42.3	1.4	0.0	2.3	2.4	9.3
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	201	797		193	749	402	1373	854		79	193	342
V/C Ratio(X)	0.86	0.94		0.90	0.73	0.73	0.96	0.05		0.47	0.23	0.44
Avail Cap(c_a), veh/h	203	799		193	749	402	1387	854		283	308	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.0	42.7	0.0	49.5	40.6	40.6	32.9	16.8	0.0	52.5	46.2	38.1
Incr Delay (d2), s/veh	29.4	18.0	0.0	37.2	3.6	6.6	15.9	0.0	0.0	4.3	0.6	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	11.8	0.0	6.7	7.2	8.1	20.1	0.6	0.0	1.1	1.2	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.4	60.7	0.0	86.7	44.2	47.2	48.8	16.8	0.0	56.8	46.8	39.0
LnGrp LOS	E	E		F	D	D	D	B		E	D	D
Approach Vol, veh/h		918			1011			1364			232	
Approach Delay, s/veh		64.1			52.3			47.8			43.3	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	56.3	16.8	29.9	49.5	16.2	17.3	29.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	46.2	12.3	25.5	45.5	18.7	12.9	24.9
Max Q Clear Time (g_c+I1), s	4.3	3.4	12.9	25.3	44.3	11.3	12.8	18.9
Green Ext Time (p_c), s	0.0	0.2	0.0	0.1	0.8	0.4	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	53.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	70	880	295	39	847	202	34	2	5
v/c Ratio	0.23	0.51	0.32	0.15	0.55	0.30	0.06	0.01	0.01
Control Delay	26.7	11.3	2.9	28.0	14.0	23.6	0.2	30.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	11.3	2.9	28.0	14.0	23.6	0.2	30.5	0.0
Queue Length 50th (ft)	18	51	0	10	99	26	0	1	0
Queue Length 95th (ft)	72	230	42	48	233	81	0	8	0
Internal Link Dist (ft)		720			1015				453
Turn Bay Length (ft)	225		275	200		225		75	
Base Capacity (vph)	582	3243	1473	381	3140	1286	1168	260	858
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.27	0.20	0.10	0.27	0.16	0.03	0.01	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	810	271	36	779	0	186	0	31	2	0	5
Future Volume (veh/h)	64	810	271	36	779	0	186	0	31	2	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	70	880	0	39	847	0	202	0	34	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	115	1437		76	1359	0	353	269	228	5	0	70
Arrive On Green	0.06	0.41	0.00	0.04	0.39	0.00	0.10	0.00	0.14	0.00	0.00	0.04
Sat Flow, veh/h	1767	3526	1572	1767	3618	0	3428	1856	1572	1767	0	1572
Grp Volume(v), veh/h	70	880	0	39	847	0	202	0	34	2	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	0	1714	1856	1572	1767	0	1572
Q Serve(g_s), s	1.7	8.8	0.0	1.0	8.7	0.0	2.5	0.0	0.8	0.1	0.0	0.1
Cycle Q Clear(g_c), s	1.7	8.8	0.0	1.0	8.7	0.0	2.5	0.0	0.8	0.1	0.0	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	1437		76	1359	0	353	269	228	5	0	70
V/C Ratio(X)	0.61	0.61		0.51	0.62	0.00	0.57	0.00	0.15	0.41	0.00	0.07
Avail Cap(c_a), veh/h	572	4371		375	3977	0	1264	1264	1071	257	0	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.4	10.5	0.0	21.0	11.1	0.0	19.1	0.0	16.7	22.3	0.0	20.5
Incr Delay (d2), s/veh	5.2	0.4	0.0	5.3	0.5	0.0	1.5	0.0	0.3	47.7	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.5	0.0	0.5	2.5	0.0	1.0	0.0	0.3	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	10.9	0.0	26.3	11.6	0.0	20.6	0.0	17.0	70.0	0.0	20.9
LnGrp LOS	C	B		C	B	A	C	A	B	E	A	C
Approach Vol, veh/h		950			886			236			7	
Approach Delay, s/veh		12.0			12.2			20.1			34.9	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	11.0	6.4	22.7	9.1	6.5	7.4	21.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	9.5	55.5	16.5	20.5	14.5	50.5
Max Q Clear Time (g_c+I1), s	2.1	2.8	3.0	10.8	4.5	2.1	3.7	10.7
Green Ext Time (p_c), s	0.0	0.1	0.0	7.0	0.5	0.0	0.1	6.6

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	611	271	50	677	154	27
v/c Ratio	0.32	0.28	0.12	0.30	0.18	0.06
Control Delay	8.9	2.7	17.6	4.6	15.9	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	2.7	17.6	4.6	15.9	9.0
Queue Length 50th (ft)	28	0	7	32	10	0
Queue Length 95th (ft)	107	35	39	59	43	17
Internal Link Dist (ft)	1748			2821	1766	
Turn Bay Length (ft)		175	250		225	
Base Capacity (vph)	3493	1564	1286	3505	2638	1222
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.04	0.19	0.06	0.02

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	562	249	46	623	142	25
Future Volume (veh/h)	562	249	46	623	142	25
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	611	271	50	677	154	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1237	552	253	2197	406	186
Arrive On Green	0.35	0.35	0.14	0.62	0.12	0.12
Sat Flow, veh/h	3618	1572	1767	3618	3428	1572
Grp Volume(v), veh/h	611	271	50	677	154	27
Grp Sat Flow(s),veh/h/ln	1763	1572	1767	1763	1714	1572
Q Serve(g_s), s	4.7	4.7	0.9	3.1	1.4	0.5
Cycle Q Clear(g_c), s	4.7	4.7	0.9	3.1	1.4	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1237	552	253	2197	406	186
V/C Ratio(X)	0.49	0.49	0.20	0.31	0.38	0.14
Avail Cap(c_a), veh/h	5410	2413	1293	8444	2704	1240
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	8.9	13.2	3.1	14.2	13.8
Incr Delay (d2), s/veh	0.3	0.7	0.4	0.1	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.1	0.3	0.2	0.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.6	13.5	3.1	14.8	14.1
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	882			727	181	
Approach Delay, s/veh	9.3			3.9	14.7	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.6	9.5	16.7				26.2
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		27.5	25.5	53.5				83.5
Max Q Clear Time (g_c+I1), s		3.4	2.9	6.7				5.1
Green Ext Time (p_c), s		0.6	0.1	5.5				5.0

Intersection Summary			
HCM 6th Ctrl Delay			7.6
HCM 6th LOS			A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1378	203	1027	40	17	185	133	91
v/c Ratio	0.44	0.82	0.68	0.50	0.04	0.07	0.41	0.74	0.24
Control Delay	55.4	27.5	53.4	14.5	2.2	35.6	10.0	63.7	13.5
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	27.7	53.4	14.5	2.2	35.6	10.0	63.7	13.5
Queue Length 50th (ft)	47	375	127	200	0	9	7	83	9
Queue Length 95th (ft)	106	588	231	321	11	30	66	163	52
Internal Link Dist (ft)		555		468			178		221
Turn Bay Length (ft)	125		225					100	
Base Capacity (vph)	231	2114	410	2458	1116	414	627	292	570
Starvation Cap Reductn	0	139	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.70	0.50	0.42	0.04	0.04	0.30	0.46	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	1231	37	187	945	37	16	12	158	122	15	69
Future Volume (veh/h)	69	1231	37	187	945	37	16	12	158	122	15	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	1338	40	203	1027	40	17	13	172	133	16	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	97	1654	49	243	1960	874	330	27	352	244	68	317
Arrive On Green	0.05	0.47	0.47	0.14	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1767	3495	104	1767	3526	1572	1295	112	1478	1189	284	1332
Grp Volume(v), veh/h	75	674	704	203	1027	40	17	0	185	133	0	91
Grp Sat Flow(s),veh/h/ln	1767	1763	1837	1767	1763	1572	1295	0	1590	1189	0	1616
Q Serve(g_s), s	3.7	29.2	29.3	10.0	16.3	1.0	1.0	0.0	9.0	9.7	0.0	4.1
Cycle Q Clear(g_c), s	3.7	29.2	29.3	10.0	16.3	1.0	5.0	0.0	9.0	18.7	0.0	4.1
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.93	1.00		0.82
Lane Grp Cap(c), veh/h	97	834	869	243	1960	874	330	0	379	244	0	385
V/C Ratio(X)	0.77	0.81	0.81	0.83	0.52	0.05	0.05	0.00	0.49	0.54	0.00	0.24
Avail Cap(c_a), veh/h	239	1094	1140	425	2559	1142	449	0	525	354	0	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.7	20.1	20.1	37.6	12.4	9.0	29.5	0.0	29.4	37.4	0.0	27.5
Incr Delay (d2), s/veh	12.2	3.5	3.4	7.3	0.2	0.0	0.1	0.0	1.0	1.9	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	11.9	12.4	4.7	6.0	0.3	0.3	0.0	3.5	2.9	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.9	23.6	23.5	44.9	12.7	9.1	29.6	0.0	30.3	39.3	0.0	27.8
LnGrp LOS	D	C	C	D	B	A	C	A	C	D	A	C
Approach Vol, veh/h		1453			1270			202			224	
Approach Delay, s/veh		25.1			17.7			30.3			34.6	
Approach LOS		C			B			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		25.8	16.8	46.8		25.8	9.4	54.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		29.5	21.5	55.5		29.5	12.1	64.9				
Max Q Clear Time (g_c+I1), s		11.0	12.0	31.3		20.7	5.7	18.3				
Green Ext Time (p_c), s		1.1	0.4	11.0		0.6	0.1	9.9				
Intersection Summary												
HCM 6th Ctrl Delay			23.1									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	1071	278	733	92	48	259	109	58	60
v/c Ratio	0.45	0.81	0.75	0.40	0.47	0.28	0.68	0.51	0.23	0.18
Control Delay	54.9	33.4	51.5	15.4	52.0	48.3	15.6	51.6	45.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	33.4	51.5	15.4	52.0	48.3	15.6	51.6	45.6	1.2
Queue Length 50th (ft)	45	300	167	134	56	29	0	67	35	0
Queue Length 95th (ft)	102	#495	#320	234	117	69	76	134	79	0
Internal Link Dist (ft)		901		555		630			460	
Turn Bay Length (ft)	250		250		200			100		100
Base Capacity (vph)	202	1524	458	2002	341	375	525	341	375	427
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.70	0.61	0.37	0.27	0.13	0.49	0.32	0.15	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	912	74	256	540	134	85	44	238	100	53	55
Future Volume (veh/h)	67	912	74	256	540	134	85	44	238	100	53	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	73	991	80	278	587	146	92	48	259	109	58	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	94	1186	96	318	1359	337	130	343	290	148	361	306
Arrive On Green	0.05	0.36	0.36	0.18	0.49	0.49	0.07	0.18	0.18	0.08	0.19	0.19
Sat Flow, veh/h	1767	3304	267	1767	2799	694	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	73	529	542	278	369	364	92	48	259	109	58	60
Grp Sat Flow(s),veh/h/ln	1767	1763	1808	1767	1763	1731	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	3.8	25.6	25.6	14.3	12.7	12.8	4.7	2.0	15.0	5.6	2.4	3.0
Cycle Q Clear(g_c), s	3.8	25.6	25.6	14.3	12.7	12.8	4.7	2.0	15.0	5.6	2.4	3.0
Prop In Lane	1.00		0.15	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	633	649	318	856	840	130	343	290	148	361	306
V/C Ratio(X)	0.77	0.84	0.84	0.87	0.43	0.43	0.71	0.14	0.89	0.74	0.16	0.20
Avail Cap(c_a), veh/h	203	769	789	460	1026	1007	343	376	319	343	376	319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	27.4	27.4	37.2	15.6	15.6	42.2	31.8	37.1	41.7	31.2	31.5
Incr Delay (d2), s/veh	12.6	6.8	6.6	12.2	0.3	0.4	6.8	0.2	24.1	7.0	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	11.5	11.8	7.1	5.0	4.9	2.3	0.9	7.6	2.7	1.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.2	34.1	34.0	49.5	16.0	16.0	49.0	32.0	61.2	48.8	31.5	31.8
LnGrp LOS	E	C	C	D	B	B	D	C	E	D	C	C
Approach Vol, veh/h		1144			1011			399			227	
Approach Delay, s/veh		35.5			25.2			54.9			39.9	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	21.7	21.3	38.0	11.4	22.6	9.5	49.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.1	18.9	24.3	40.7	18.1	18.9	10.7	54.3
Max Q Clear Time (g_c+I1), s	7.6	17.0	16.3	27.6	6.7	5.0	5.8	14.8
Green Ext Time (p_c), s	0.2	0.2	0.5	5.8	0.1	0.3	0.1	5.4

Intersection Summary			
HCM 6th Ctrl Delay			34.9
HCM 6th LOS			C

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	613	32	1593	93	775
v/c Ratio	0.79	0.09	0.82	0.55	0.33
Control Delay	47.9	12.8	22.5	63.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	12.8	22.5	63.1	7.2
Queue Length 50th (ft)	226	0	472	68	106
Queue Length 95th (ft)	298	29	594	127	140
Internal Link Dist (ft)	1811		1987		1742
Turn Bay Length (ft)	250			350	
Base Capacity (vph)	951	421	2300	204	2773
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.08	0.69	0.46	0.28

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	560	33	1044	421	86	713
Future Volume (veh/h)	560	33	1044	421	86	713
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	609	36	1135	458	93	775
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	735	327	1424	559	119	2443
Arrive On Green	0.21	0.21	0.58	0.58	0.07	0.69
Sat Flow, veh/h	3534	1572	2566	971	1767	3618
Grp Volume(v), veh/h	609	36	800	793	93	775
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1681	1767	1763
Q Serve(g_s), s	15.0	1.7	32.0	34.4	4.7	7.9
Cycle Q Clear(g_c), s	15.0	1.7	32.0	34.4	4.7	7.9
Prop In Lane	1.00	1.00		0.58	1.00	
Lane Grp Cap(c), veh/h	735	327	1015	968	119	2443
V/C Ratio(X)	0.83	0.11	0.79	0.82	0.78	0.32
Avail Cap(c_a), veh/h	1071	476	1311	1250	224	3243
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	29.1	14.9	15.5	41.7	5.5
Incr Delay (d2), s/veh	3.7	0.1	2.5	3.5	10.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	0.6	12.1	12.6	2.4	2.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.1	29.3	17.4	18.9	52.1	5.6
LnGrp LOS	D	C	B	B	D	A
Approach Vol, veh/h	645		1593			868
Approach Delay, s/veh	37.6		18.2			10.5
Approach LOS	D		B			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.6	56.8				67.4		23.4
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	11.5	67.5				83.5		27.5
Max Q Clear Time (g_c+I1), s	6.7	36.4				9.9		17.0
Green Ext Time (p_c), s	0.1	15.9				6.7		1.9

Intersection Summary		
HCM 6th Ctrl Delay		20.1
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	151	250	529	385	175
v/c Ratio	0.36	0.14	0.52	0.42	0.34
Control Delay	19.9	5.4	9.5	16.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	5.4	9.5	16.0	5.7
Queue Length 50th (ft)	33	13	26	40	0
Queue Length 95th (ft)	92	32	74	90	43
Internal Link Dist (ft)		820	653	438	
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	1251	3505	2766	2786	1216
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.19	0.14	0.14

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	139	230	212	275	288	227
Future Volume (veh/h)	139	230	212	275	288	227
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	151	250	230	299	369	187
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	205	1933	551	492	752	335
Arrive On Green	0.12	0.55	0.31	0.31	0.21	0.21
Sat Flow, veh/h	1767	3618	1856	1572	3534	1572
Grp Volume(v), veh/h	151	250	230	299	369	187
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1572	1767	1572
Q Serve(g_s), s	3.1	1.3	3.9	6.1	3.5	4.0
Cycle Q Clear(g_c), s	3.1	1.3	3.9	6.1	3.5	4.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	205	1933	551	492	752	335
V/C Ratio(X)	0.74	0.13	0.42	0.61	0.49	0.56
Avail Cap(c_a), veh/h	1431	6878	1801	1607	3518	1565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	4.1	10.2	11.0	13.0	13.2
Incr Delay (d2), s/veh	5.1	0.0	0.5	1.2	0.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.3	1.2	1.8	1.2	3.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.1	4.2	10.7	12.2	13.5	14.7
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		401	529		556	
Approach Delay, s/veh		10.6	11.6		13.9	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				25.2		12.5	8.9	16.3
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				73.5		37.5	30.5	38.5
Max Q Clear Time (g_c+I1), s				3.3		6.0	5.1	8.1
Green Ext Time (p_c), s				1.8		2.0	0.4	3.7

Intersection Summary			
HCM 6th Ctrl Delay			12.2
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	13	438	7	22	408	161	27	303
v/c Ratio	0.29	0.04	0.66	0.04	0.10	0.68	0.08	0.13	0.45
Control Delay	31.5	24.4	8.7	35.7	24.9	24.9	9.5	35.0	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	24.4	8.7	35.7	24.9	24.9	9.5	35.0	21.5
Queue Length 50th (ft)	19	3	0	2	3	93	6	7	29
Queue Length 95th (ft)	85	22	84	18	29	296	44	42	105
Internal Link Dist (ft)		865			140		449		1007
Turn Bay Length (ft)	225			50		400		125	
Base Capacity (vph)	418	1075	1096	184	777	1404	3115	217	1407
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.01	0.40	0.04	0.03	0.29	0.05	0.12	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	12	403	6	11	9	375	144	4	25	180	98
Future Volume (veh/h)	70	12	403	6	11	9	375	144	4	25	180	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	13	438	7	12	10	408	157	4	27	196	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	583	494	16	250	208	475	1323	34	52	308	161
Arrive On Green	0.06	0.31	0.31	0.01	0.27	0.27	0.27	0.38	0.38	0.03	0.14	0.14
Sat Flow, veh/h	1767	1856	1572	1767	936	780	1767	3513	89	1767	2238	1170
Grp Volume(v), veh/h	76	13	438	7	0	22	408	79	82	27	153	150
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	0	1715	1767	1763	1839	1767	1763	1645
Q Serve(g_s), s	2.8	0.3	17.6	0.3	0.0	0.6	14.6	1.9	1.9	1.0	5.4	5.8
Cycle Q Clear(g_c), s	2.8	0.3	17.6	0.3	0.0	0.6	14.6	1.9	1.9	1.0	5.4	5.8
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.05	1.00		0.71
Lane Grp Cap(c), veh/h	100	583	494	16	0	458	475	664	693	52	243	226
V/C Ratio(X)	0.76	0.02	0.89	0.43	0.00	0.05	0.86	0.12	0.12	0.52	0.63	0.66
Avail Cap(c_a), veh/h	332	850	720	146	0	605	1181	1575	1643	172	569	531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	15.8	21.7	32.8	0.0	18.1	23.2	13.5	13.5	31.8	27.1	27.3
Incr Delay (d2), s/veh	11.1	0.0	9.2	17.3	0.0	0.0	4.7	0.1	0.1	7.7	2.7	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.1	7.2	0.2	0.0	0.2	6.1	0.7	0.7	0.5	2.3	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	15.8	30.9	50.2	0.0	18.2	27.8	13.6	13.6	39.6	29.8	30.6
LnGrp LOS	D	B	C	D	A	B	C	B	B	D	C	C
Approach Vol, veh/h		527			29			569			330	
Approach Delay, s/veh		32.2			25.9			23.8			30.9	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	29.6	5.1	25.4	22.4	13.7	8.3	22.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.5	59.5	5.5	30.5	44.5	21.5	12.5	23.5				
Max Q Clear Time (g_c+I1), s	3.0	3.9	2.3	19.6	16.6	7.8	4.8	2.6				
Green Ext Time (p_c), s	0.0	0.9	0.0	1.3	1.3	1.4	0.1	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			28.5									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	454	48	219	291	419	40	517
v/c Ratio	0.48	0.45	0.27	0.45	0.67	0.28	0.25	0.65
Control Delay	39.6	16.4	41.9	32.7	35.9	15.0	43.2	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	16.4	41.9	32.7	35.9	15.0	43.2	25.8
Queue Length 50th (ft)	55	51	21	43	120	66	17	83
Queue Length 95th (ft)	138	122	69	102	259	120	62	179
Internal Link Dist (ft)		902		357		1037		1981
Turn Bay Length (ft)	150		150		150		300	
Base Capacity (vph)	451	1412	231	939	865	2640	182	1384
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.32	0.21	0.23	0.34	0.16	0.22	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	201	217	44	157	44	268	320	65	37	283	192
Future Volume (veh/h)	119	201	217	44	157	44	268	320	65	37	283	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	129	218	0	48	171	0	291	348	0	40	308	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	171	562		89	398		377	1189		78	592	
Arrive On Green	0.10	0.16	0.00	0.05	0.11	0.00	0.21	0.34	0.00	0.04	0.17	0.00
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3618	0	1767	3618	0
Grp Volume(v), veh/h	129	218	0	48	171	0	291	348	0	40	308	0
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1763	0	1767	1763	0
Q Serve(g_s), s	3.1	2.4	0.0	1.2	2.0	0.0	6.8	3.2	0.0	1.0	3.5	0.0
Cycle Q Clear(g_c), s	3.1	2.4	0.0	1.2	2.0	0.0	6.8	3.2	0.0	1.0	3.5	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	171	562		89	398		377	1189		78	592	
V/C Ratio(X)	0.75	0.39		0.54	0.43		0.77	0.29		0.52	0.52	
Avail Cap(c_a), veh/h	743	2282		381	1561		1425	4524		301	2282	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.4	16.6	0.0	20.4	18.2	0.0	16.3	10.7	0.0	20.6	16.7	0.0
Incr Delay (d2), s/veh	6.6	0.4	0.0	5.0	0.7	0.0	3.4	0.1	0.0	5.2	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.9	0.0	0.5	0.7	0.0	2.6	1.0	0.0	0.5	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	17.0	0.0	25.4	18.9	0.0	19.7	10.9	0.0	25.8	17.4	0.0
LnGrp LOS	C	B		C	B		B	B		C	B	
Approach Vol, veh/h		347			219			639			348	
Approach Delay, s/veh		20.3			20.3			14.9			18.4	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	19.4	6.7	11.5	13.9	11.9	8.8	9.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	56.5	9.5	28.5	35.5	28.5	18.5	19.5				
Max Q Clear Time (g_c+I1), s	3.0	5.2	3.2	4.4	8.8	5.5	5.1	4.0				
Green Ext Time (p_c), s	0.0	2.4	0.0	1.3	0.8	1.9	0.2	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			17.6									
HCM 6th LOS			B									

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	540	229	435	211	237
v/c Ratio	0.57	0.53	0.21	0.51	0.43
Control Delay	19.6	25.7	5.7	26.0	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	25.7	5.7	26.0	6.4
Queue Length 50th (ft)	70	66	29	61	0
Queue Length 95th (ft)	152	161	63	152	52
Internal Link Dist (ft)	580		902	443	
Turn Bay Length (ft)		125			
Base Capacity (vph)	2205	1145	3467	1145	1107
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.24	0.20	0.13	0.18	0.21

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	346	151	211	400	194	218
Future Volume (veh/h)	346	151	211	400	194	218
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	376	164	229	435	211	237
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	651	280	308	1961	392	349
Arrive On Green	0.27	0.27	0.17	0.56	0.22	0.22
Sat Flow, veh/h	2493	1032	1767	3618	1767	1572
Grp Volume(v), veh/h	275	265	229	435	211	237
Grp Sat Flow(s),veh/h/ln	1763	1670	1767	1763	1767	1572
Q Serve(g_s), s	5.5	5.6	5.0	2.5	4.3	5.6
Cycle Q Clear(g_c), s	5.5	5.6	5.0	2.5	4.3	5.6
Prop In Lane		0.62	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	478	453	308	1961	392	349
V/C Ratio(X)	0.57	0.59	0.74	0.22	0.54	0.68
Avail Cap(c_a), veh/h	1543	1461	1546	6561	1546	1376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.8	12.8	15.9	4.6	13.9	14.5
Incr Delay (d2), s/veh	1.1	1.2	3.6	0.1	1.1	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.8	1.9	0.5	1.5	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.9	14.0	19.5	4.6	15.1	16.8
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	540			664	448	
Approach Delay, s/veh	13.9			9.7	16.0	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.5	11.6	15.5				27.1
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		35.5	35.5	35.5				75.5
Max Q Clear Time (g_c+I1), s		7.6	7.0	7.6				4.5
Green Ext Time (p_c), s		1.5	0.7	3.4				3.1

Intersection Summary		
HCM 6th Ctrl Delay		12.8
HCM 6th LOS		B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	28	1045	71	648	296	121	8
v/c Ratio	0.18	0.73	0.33	0.36	0.68	0.19	0.01
Control Delay	46.8	22.7	44.6	13.8	35.2	0.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	22.7	44.6	13.8	35.2	0.6	0.0
Queue Length 50th (ft)	13	206	32	77	126	0	0
Queue Length 95th (ft)	51	383	97	201	277	0	0
Internal Link Dist (ft)		424		851		1161	269
Turn Bay Length (ft)	125		125		75		
Base Capacity (vph)	171	2269	303	2518	877	1074	1093
Starvation Cap Reductn	0	91	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.48	0.23	0.26	0.34	0.11	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	682	280	65	595	1	272	0	111	0	0	7
Future Volume (veh/h)	26	682	280	65	595	1	272	0	111	0	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	741	304	71	647	1	296	0	121	0	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	1051	431	106	1659	3	497	0	421	129	0	421
Arrive On Green	0.03	0.43	0.43	0.06	0.46	0.46	0.27	0.00	0.27	0.00	0.00	0.27
Sat Flow, veh/h	1767	2438	1000	1767	3612	6	1396	0	1572	1260	0	1572
Grp Volume(v), veh/h	28	536	509	71	316	332	296	0	121	0	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1676	1767	1763	1855	1396	0	1572	1260	0	1572
Q Serve(g_s), s	0.9	13.9	13.9	2.2	6.6	6.6	11.1	0.0	3.4	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.9	13.9	13.9	2.2	6.6	6.6	11.3	0.0	3.4	0.0	0.0	0.2
Prop In Lane	1.00		0.60	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	56	760	722	106	810	852	497	0	421	129	0	421
V/C Ratio(X)	0.50	0.70	0.71	0.67	0.39	0.39	0.60	0.00	0.29	0.00	0.00	0.02
Avail Cap(c_a), veh/h	205	1561	1484	364	1719	1808	1260	0	1280	818	0	1280
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	13.0	13.0	25.7	10.0	10.0	19.2	0.0	16.2	0.0	0.0	15.1
Incr Delay (d2), s/veh	6.8	1.2	1.3	7.2	0.3	0.3	1.1	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.6	4.4	1.1	2.1	2.2	3.4	0.0	1.2	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	14.2	14.3	33.0	10.3	10.2	20.4	0.0	16.6	0.0	0.0	15.1
LnGrp LOS	C	B	B	C	B	B	C	A	B	A	A	B
Approach Vol, veh/h		1073			719			417			8	
Approach Delay, s/veh		14.7			12.5			19.3			15.1	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.5	7.8	28.6		19.5	6.3	30.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		45.5	11.5	49.5		45.5	6.5	54.5				
Max Q Clear Time (g_c+I1), s		13.3	4.2	15.9		2.2	2.9	8.6				
Green Ext Time (p_c), s		1.7	0.1	8.2		0.0	0.0	4.3				
Intersection Summary												
HCM 6th Ctrl Delay			14.9									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1531	1022	927	349	398	1501
v/c Ratio	1.03	0.40	1.03	0.59	0.61	0.81
Control Delay	65.0	6.6	81.2	14.7	48.9	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	45.6
Total Delay	65.0	6.6	81.2	14.7	48.9	64.5
Queue Length 50th (ft)	~654	137	~403	54	146	436
Queue Length 95th (ft)	#791	169	#534	153	199	556
Internal Link Dist (ft)		852	424		317	
Turn Bay Length (ft)	275			200	100	300
Base Capacity (vph)	1487	2567	902	596	654	1846
Starvation Cap Reductn	0	0	0	0	0	475
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.40	1.03	0.59	0.61	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1378	920	834	314	358	1351
Future Volume (veh/h)	1378	920	834	314	358	1351
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1531	1022	927	349	398	1501
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1500	2582	908	405	660	1744
Arrive On Green	0.44	0.73	0.26	0.26	0.19	0.19
Sat Flow, veh/h	3428	3618	3618	1572	3428	2768
Grp Volume(v), veh/h	1531	1022	927	349	398	1501
Grp Sat Flow(s),veh/h/ln	1714	1763	1763	1572	1714	1384
Q Serve(g_s), s	52.5	13.1	30.9	25.4	12.7	23.1
Cycle Q Clear(g_c), s	52.5	13.1	30.9	25.4	12.7	23.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	1500	2582	908	405	660	1744
V/C Ratio(X)	1.02	0.40	1.02	0.86	0.60	0.86
Avail Cap(c_a), veh/h	1500	2582	908	405	660	1744
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	6.0	44.5	42.5	44.3	17.9
Incr Delay (d2), s/veh	28.6	0.1	35.3	17.1	4.1	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	26.8	4.2	17.7	22.2	5.8	35.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	62.4	6.1	79.9	59.6	48.3	23.8
LnGrp LOS	F	A	F	E	D	C
Approach Vol, veh/h		2553	1276		1899	
Approach Delay, s/veh		39.9	74.3		28.9	
Approach LOS		D	E		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				92.4		27.6	57.0	35.4
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				87.9		23.1	52.5	30.9
Max Q Clear Time (g_c+I1), s				15.1		25.1	54.5	32.9
Green Ext Time (p_c), s				9.4		0.0	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			43.9
HCM 6th LOS			D

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	112	1992	2016	262	829	133
v/c Ratio	0.99	0.72	1.18	0.34	0.63	0.20
Control Delay	152.5	27.0	123.8	25.4	39.5	14.7
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	152.5	27.0	123.8	25.4	39.5	14.7
Queue Length 50th (ft)	57	515	~1241	155	335	37
Queue Length 95th (ft)	#125	571	#1374	225	406	85
Internal Link Dist (ft)		693	852		265	
Turn Bay Length (ft)	150			150	125	125
Base Capacity (vph)	113	2769	1705	763	1326	656
Starvation Cap Reductn	0	0	29	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.72	1.20	0.34	0.63	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	101	1793	1814	236	746	120
Future Volume (veh/h)	101	1793	1814	236	746	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	1992	2016	262	829	133
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	114	2786	1716	765	1337	613
Arrive On Green	0.03	0.55	0.49	0.49	0.39	0.39
Sat Flow, veh/h	3428	5233	3618	1572	3428	1572
Grp Volume(v), veh/h	112	1992	2016	262	829	133
Grp Sat Flow(s),veh/h/ln	1714	1689	1763	1572	1714	1572
Q Serve(g_s), s	4.9	43.7	73.0	15.4	29.2	8.5
Cycle Q Clear(g_c), s	4.9	43.7	73.0	15.4	29.2	8.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	114	2786	1716	765	1337	613
V/C Ratio(X)	0.98	0.71	1.17	0.34	0.62	0.22
Avail Cap(c_a), veh/h	114	2786	1716	765	1337	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.5	25.0	38.5	23.7	36.8	30.5
Incr Delay (d2), s/veh	79.0	0.9	85.3	0.3	2.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	17.3	50.8	5.8	12.7	9.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	151.4	25.9	123.8	24.0	39.0	31.3
LnGrp LOS	F	C	F	C	D	C
Approach Vol, veh/h		2104	2278		962	
Approach Delay, s/veh		32.6	112.3		37.9	
Approach LOS		C	F		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		87.0		63.0	9.5	77.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		82.5		58.5	5.0	73.0
Max Q Clear Time (g_c+I1), s		45.7		31.2	6.9	75.0
Green Ext Time (p_c), s		21.8		3.9	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			67.5
HCM 6th LOS			E

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	117	341	486	39	88	522
v/c Ratio	0.28	0.54	0.43	0.07	0.23	0.30
Control Delay	17.3	6.2	13.2	5.7	17.9	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	6.2	13.2	5.7	17.9	5.5
Queue Length 50th (ft)	23	0	50	0	18	26
Queue Length 95th (ft)	69	54	99	16	57	53
Internal Link Dist (ft)	1876		3616			1513
Turn Bay Length (ft)				300	300	
Base Capacity (vph)	1655	1500	3121	1400	1217	3505
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.23	0.16	0.03	0.07	0.15

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	108	314	447	36	81	480
Future Volume (veh/h)	108	314	447	36	81	480
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	117	341	486	39	88	522
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	503	447	893	398	220	1730
Arrive On Green	0.28	0.28	0.25	0.25	0.12	0.49
Sat Flow, veh/h	1767	1572	3618	1572	1767	3618
Grp Volume(v), veh/h	117	341	486	39	88	522
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	1767	1763
Q Serve(g_s), s	2.0	7.9	4.8	0.8	1.8	3.5
Cycle Q Clear(g_c), s	2.0	7.9	4.8	0.8	1.8	3.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	503	447	893	398	220	1730
V/C Ratio(X)	0.23	0.76	0.54	0.10	0.40	0.30
Avail Cap(c_a), veh/h	1920	1709	3391	1512	1082	5945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	13.1	12.9	11.4	16.1	6.1
Incr Delay (d2), s/veh	0.2	2.7	0.5	0.1	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.3	1.5	0.2	0.7	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.2	15.8	13.5	11.5	17.3	6.2
LnGrp LOS	B	B	B	B	B	A
Approach Vol, veh/h	458		525			610
Approach Delay, s/veh	14.6		13.3			7.8
Approach LOS	B		B			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	9.5	14.6	24.1	15.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	24.5	38.5	67.5	43.5
Max Q Clear Time (g_c+I1), s	3.8	6.8	5.5	9.9
Green Ext Time (p_c), s	0.2	3.4	3.7	1.5

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	102	234	127	135	191	90	1093	198	152	508
v/c Ratio	0.55	0.76	0.64	0.36	0.40	0.52	0.82	0.73	0.17	0.50
Control Delay	60.6	60.1	64.3	44.6	9.1	60.3	34.4	61.5	18.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	60.1	64.3	44.6	9.1	60.3	34.4	61.5	18.8	3.6
Queue Length 50th (ft)	73	161	91	89	0	65	366	141	66	0
Queue Length 95th (ft)	135	#283	#173	159	64	122	463	#243	111	59
Internal Link Dist (ft)		851		199			1179		604	
Turn Bay Length (ft)	125		100		100	125		125		125
Base Capacity (vph)	236	369	233	389	481	222	1644	336	1002	1083
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.63	0.55	0.35	0.40	0.41	0.66	0.59	0.15	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	179	36	117	124	176	83	826	179	182	140	467
Future Volume (veh/h)	94	179	36	117	124	176	83	826	179	182	140	467
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	102	195	39	127	135	191	90	898	195	198	152	508
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	131	239	48	161	326	276	116	1142	248	240	866	734
Arrive On Green	0.07	0.16	0.16	0.09	0.18	0.18	0.07	0.40	0.40	0.14	0.47	0.47
Sat Flow, veh/h	1767	1501	300	1767	1856	1572	1767	2881	625	1767	1856	1572
Grp Volume(v), veh/h	102	0	234	127	135	191	90	549	544	198	152	508
Grp Sat Flow(s),veh/h/ln	1767	0	1801	1767	1856	1572	1767	1763	1743	1767	1856	1572
Q Serve(g_s), s	4.7	0.0	10.4	5.8	5.4	9.4	4.1	22.6	22.6	9.0	3.9	21.1
Cycle Q Clear(g_c), s	4.7	0.0	10.4	5.8	5.4	9.4	4.1	22.6	22.6	9.0	3.9	21.1
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	131	0	287	161	326	276	116	699	691	240	866	734
V/C Ratio(X)	0.78	0.00	0.82	0.79	0.41	0.69	0.77	0.79	0.79	0.82	0.18	0.69
Avail Cap(c_a), veh/h	293	0	446	288	455	386	276	1033	1022	417	1236	1047
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	0.0	33.6	36.8	30.3	32.0	38.0	21.9	21.9	34.8	12.8	17.4
Incr Delay (d2), s/veh	9.4	0.0	6.6	8.3	0.8	3.1	10.3	2.4	2.5	7.0	0.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	4.9	2.8	2.4	3.7	2.1	9.2	9.2	4.3	1.6	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	0.0	40.2	45.2	31.2	35.1	48.4	24.3	24.4	41.8	12.9	18.6
LnGrp LOS	D	A	D	D	C	D	D	C	C	D	B	B
Approach Vol, veh/h		336			453			1183			858	
Approach Delay, s/veh		42.3			36.7			26.2			22.9	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.7	37.3	12.0	17.7	10.0	43.1	10.7	19.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	19.5	48.5	13.5	20.5	12.9	55.1	13.7	20.3
Max Q Clear Time (g_c+I1), s	11.0	24.6	7.8	12.4	6.1	23.1	6.7	11.4
Green Ext Time (p_c), s	0.3	8.2	0.1	0.8	0.1	3.0	0.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	400	1026	1087	98	1536	304
v/c Ratio	0.30	0.88	0.59	0.11	0.84	0.19
Control Delay	26.0	39.3	21.5	3.3	29.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	39.3	21.5	3.3	29.5	0.3
Queue Length 50th (ft)	111	382	307	0	534	0
Queue Length 95th (ft)	166	544	410	28	698	0
Internal Link Dist (ft)			1261		1568	
Turn Bay Length (ft)		650				
Base Capacity (vph)	1709	1450	2324	1072	2324	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.71	0.47	0.09	0.66	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	368	0	944	0	1000	90	0	1413	280
Future Volume (veh/h)	0	0	0	368	0	944	0	1000	90	0	1413	280
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1856	0	1856	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h				400	0	1026	0	1087	98	0	1536	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	0	3	3	0	3	3
Cap, veh/h				1408	0	1137	0	1805	805	0	1805	
Arrive On Green				0.41	0.00	0.41	0.00	0.51	0.51	0.00	0.51	0.00
Sat Flow, veh/h				3428	0	2768	0	3618	1572	0	3618	1572
Grp Volume(v), veh/h				400	0	1026	0	1087	98	0	1536	0
Grp Sat Flow(s),veh/h/ln				1714	0	1384	0	1763	1572	0	1763	1572
Q Serve(g_s), s				9.1	0.0	40.4	0.0	25.3	3.8	0.0	43.9	0.0
Cycle Q Clear(g_c), s				9.1	0.0	40.4	0.0	25.3	3.8	0.0	43.9	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1408	0	1137	0	1805	805	0	1805	
V/C Ratio(X)				0.28	0.00	0.90	0.00	0.60	0.12	0.00	0.85	
Avail Cap(c_a), veh/h				1663	0	1342	0	2255	1006	0	2255	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				22.9	0.0	32.1	0.0	20.1	14.8	0.0	24.6	0.0
Incr Delay (d2), s/veh				0.1	0.0	7.8	0.0	0.3	0.1	0.0	2.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.6	0.0	14.1	0.0	9.9	1.3	0.0	17.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.0	0.0	40.0	0.0	20.4	14.9	0.0	27.3	0.0
LnGrp LOS				C	A	D	A	C	B	A	C	
Approach Vol, veh/h					1426			1185			1536	
Approach Delay, s/veh					35.2			19.9			27.3	
Approach LOS					D			B			C	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		64.1				64.1		52.3				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		74.5				74.5		56.5				
Max Q Clear Time (g_c+I1), s		27.3				45.9		42.4				
Green Ext Time (p_c), s		10.0				13.7		5.4				
Intersection Summary												
HCM 6th Ctrl Delay			27.9									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Appendix L

Environmental Noise Assessment

Environmental Noise Assessment

Scotts Valley Development Project

City of Vallejo, California

June 27, 2024

Project #240210

Prepared for:

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Table of Contents

List of Figures

List of Tables

Appendices

INTRODUCTION

The Scotts Valley Development project is located in the City of Vallejo, California.

The proposed project would consist of an eight-story casino that is proposed to have 238,266 square feet of gaming floor area and ballroom/event space that could accommodate a maximum of 2,500 guests. It would also include 24 single family Tribal residences, and a 12,555 square foot Tribal administration building. Two alternatives to the project have also been studied. Alternative B is a Reduced Intensity Alternative which consists of the same casino project but without the Tribal Housing and Offices. Alternative C is a Non-Gaming Alternative that would involve construction of 50 single family homes and three Tribal administration buildings with a total of 23,353 square feet of building space. This alternative would also include two commercial buildings with a total of 129,702 square feet of building space and two hotel buildings with a total of 264 hotel rooms.

Figure 1a-c shows the project site plans. **Figure 2** shows an aerial photo of the project site.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.

SCOTTS VALLEY, VALLEJO, CA | Site Plan Scheme 4 With residential

10, June 2024

Steelman Partners

Scotts Valley Casino and Residential

City of Vallejo, California

Figure 1a

Scenario A Site Plan

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SCOTTS VALLEY, VALLEJO, CA | Site Plan Scheme 4 Without residential

10, June 2024

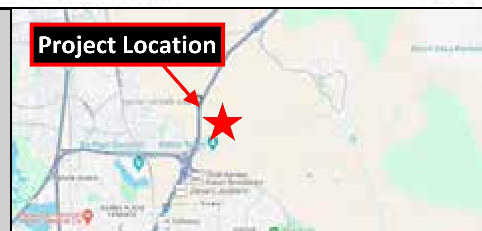
Steelman Partners

Scotts Valley Casino and Residential

City of Vallejo, California

Figure 1b

Scenario B Site Plan



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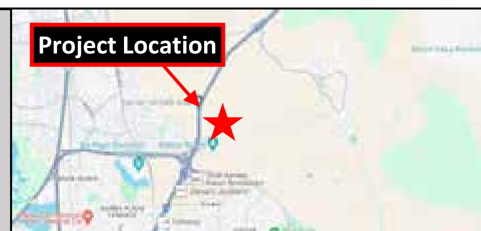
Scotts Valley Casino and Residential

City of Vallejo, California

Figure 1c

Scenario C Site Plan



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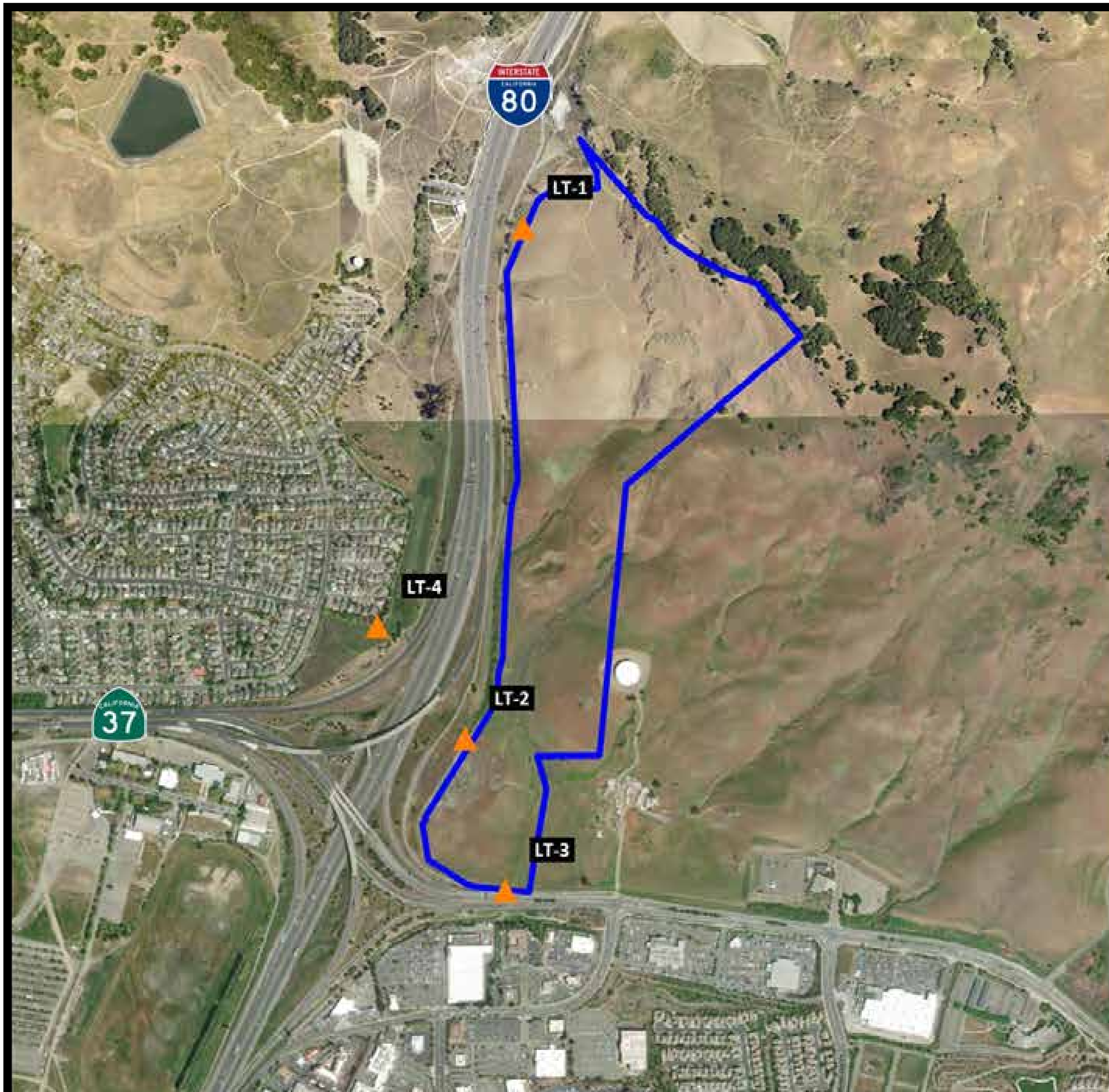

Scotts Valley Development Project

City of Vallejo, California

Figure 2

Noise Measurement Sites

Legend

Project Site

Noise Measurement - Long Term

0 ft 500 ft 1000 ft 1750 ft

Projection: UTM Zone 10 / WGS84 / meters
Rev. Date: 06/10/2024

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The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60-dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. **Appendix A** provides a summary of acoustical terms used in this report.

TABLE 1: TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.), at 80 km/hr. (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	--60--	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September, 2013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regards to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING NOISE AND VIBRATION ENVIRONMENTS

EXISTING NOISE RECEPTORS

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Sensitive noise receptors may also include threatened or endangered noise-sensitive biological species, although many jurisdictions have not adopted noise standards for wildlife areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the project site, sensitive land uses include existing single-family residential uses.

The existing noise environment in the project area is primarily defined by traffic on I-80. To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted continuous (24-hr.) noise level measurements at four locations on the project site. Noise measurement locations are shown on **Figure 2**. A summary of the noise level measurement survey results is provided in **Table 2**. **Appendix B** contains the complete results of the noise monitoring.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

Larson Davis Laboratories (LDL) model 820 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with a CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

TABLE 2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

Location	Date	L_{dn}	Daytime L_{eq}	Daytime L_{50}	Daytime L_{max}	Nighttime L_{eq}	Nighttime L_{50}	Nighttime L_{max}
LT-1	4/5/24	74	70	70	77	67	66	74
	4/6/24	72	68	68	79	65	64	74
	4/7/24	69	67	67	79	62	61	73
LT-2	4/5/24	62	58	56	67	55	54	65
	4/6/24	62	59	57	70	56	55	68
	4/7/24	59	57	55	67	52	52	65
LT-3	4/5/24	73	71	70	83	66	59	80
	4/6/24	73	72	70	89	64	59	80
	4/7/24	71	70	68	88	62	56	79
LT-4	4/5/24	67	63	61	72	61	59	69
	4/6/24	63	57	56	71	57	55	69
	4/7/24	61	57	56	69	55	54	67

- *All values shown in dBA*
- *Daytime hours: 7:00 a.m. to 10:00 p.m.*
- *Nighttime Hours: 10:00 p.m. to 7:00 a.m.*
- *Source: Saxelby Acoustics, 2024.*

FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for existing and future, project and no-project conditions.

Existing and Cumulative noise levels due to traffic are calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict traffic noise levels in terms of L_{dn}, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Project trip generation volumes were provided by the project traffic engineer (Abrams Associates, 2024), truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for Existing and Cumulative conditions which would result from the project are provided in terms of L_{dn}.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations sensitive receptors may not receive full shielding from noise barriers or may be located at distances which vary from the assumed calculation distance.

Tables 3-7 summarize the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area. **Appendix C** provides the complete inputs and results of the FHWA traffic modeling.

TABLE 3: PREDICTED TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Existing no Project	Existing + Project	Change
Auto Mall Parkway	East of Project Access	47.4	47.7	0.3
Auto Mall Parkway	West of Project Access	53.5	54.1	0.6
N Ascot Parkway	South of Auto Mall Parkway	53.7	53.9	0.2
Auto Mall Parkway	East of Ascot Court	44.7	45.0	0.3
Columbus Parkway	West of Redwood Parkway	55.9	54.1	-1.8
Columbus Parkway	East of Redwood Parkway	56.5	57.0	0.5
Redwood Parkway	South of Columbus Parkway	51.6	51.2	-0.4
Admiral Callaghan Lane	East of Autoclub way	48.5	48.8	0.3
Plaza Drive	South of Admiral Callaghan Lane	50.7	50.8	0.1
Turner Parkway	East of Admiral Callaghan Lane	63.3	63.4	0.1
Admiral Callaghan Lane	South of Turner Parkway	57.8	58.2	0.4
Turner Parkway	East of Plaza Drive	56.1	56.2	0.1
Redwood Parkway	West of Ascot Parkway	59.7	59.8	0.1
Oakwood Avenue	South of Redwood Parkway	57.7	57.6	-0.1

TABLE 4: BASELINE TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Baseline no Project	Baseline + Project	Change
Auto Mall Parkway	East of Project Access	48.1	48.4	0.3
Auto Mall Parkway	West of Project Access	54.1	54.7	0.6
N Ascot Parkway	South of Auto Mall Parkway	54.1	54.3	0.2
Auto Mall Parkway	East of Ascot Court	45.2	45.5	0.3
Columbus Parkway	West of Redwood Parkway	56.4	56.7	0.3
Columbus Parkway	East of Redwood Parkway	57.2	57.6	0.4
Redwood Parkway	South of Columbus Parkway	51.7	51.7	0.0
Admiral Callaghan Lane	East of Autoclub way	48.9	49.2	0.3
Plaza Drive	South of Admiral Callaghan Lane	50.8	51.0	0.2
Turner Parkway	East of Admiral Callaghan Lane	63.6	63.7	0.1
Admiral Callaghan Lane	South of Turner Parkway	58.3	58.6	0.3
Turner Parkway	East of Plaza Drive	56.3	56.4	0.1
Redwood Parkway	West of Ascot Parkway	60.0	60.1	0.1
Oakwood Avenue	South of Redwood Parkway	57.8	57.9	0.1

TABLE 5: CUMULATIVE SCENARIO A TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Cumulative no Project	Cumulative + Project	Change
Auto Mall Parkway	East of Project Access	48.8	48.6	-0.2
Auto Mall Parkway	West of Project Access	54.8	55.0	0.2
N Ascot Parkway	South of Auto Mall Parkway	54.8	55.0	0.2
Auto Mall Parkway	East of Ascot Court	45.9	46.2	0.3
Columbus Parkway	West of Redwood Parkway	57.1	57.4	0.3
Columbus Parkway	East of Redwood Parkway	57.9	58.2	0.3
Redwood Parkway	South of Columbus Parkway	52.5	52.5	0.0
Admiral Callaghan Lane	East of Autoclub way	49.5	49.7	0.2
Plaza Drive	South of Admiral Callaghan Lane	50.8	51.0	0.2
Turner Parkway	East of Admiral Callaghan Lane	64.3	64.4	0.1
Admiral Callaghan Lane	South of Turner Parkway	59.0	59.3	0.3
Turner Parkway	East of Plaza Drive	57.1	57.1	0.0
Redwood Parkway	West of Ascot Parkway	60.7	60.8	0.1
Oakwood Avenue	South of Redwood Parkway	58.5	59.4	0.9

TABLE 6: CUMULATIVE SCENARIO B TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Cumulative no Project	Cumulative + Project	Change
Auto Mall Parkway	East of Project Access	48.8	49.0	0.2
Auto Mall Parkway	West of Project Access	54.8	55.3	0.5
N Ascot Parkway	South of Auto Mall Parkway	54.8	55.0	0.2
Auto Mall Parkway	East of Ascot Court	45.9	46.1	0.2
Columbus Parkway	West of Redwood Parkway	57.1	57.4	0.3
Columbus Parkway	East of Redwood Parkway	57.9	58.2	0.3
Redwood Parkway	South of Columbus Parkway	52.5	52.5	0.0
Admiral Callaghan Lane	East of Autoclub way	49.5	49.7	0.2
Plaza Drive	South of Admiral Callaghan Lane	50.8	51.0	0.2
Turner Parkway	East of Admiral Callaghan Lane	64.3	64.4	0.1
Admiral Callaghan Lane	South of Turner Parkway	59.0	59.3	0.3
Turner Parkway	East of Plaza Drive	57.1	57.1	0.0
Redwood Parkway	West of Ascot Parkway	60.7	60.8	0.1
Oakwood Avenue	South of Redwood Parkway	58.5	58.6	0.1

TABLE 7: CUMULATIVE SCENARIO C TRAFFIC NOISE LEVEL AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Cumulative no Project	Cumulative + Project	Change
Auto Mall Parkway	East of Project Access	48.8	49.0	0.2
Auto Mall Parkway	West of Project Access	54.8	55.1	0.3
N Ascot Parkway	South of Auto Mall Parkway	54.8	54.9	0.1
Auto Mall Parkway	East of Ascot Court	45.9	46.1	0.2
Columbus Parkway	West of Redwood Parkway	57.1	57.3	0.2
Columbus Parkway	East of Redwood Parkway	57.9	58.1	0.2
Redwood Parkway	South of Columbus Parkway	52.5	52.5	0.0
Admiral Callaghan Lane	East of Autoclub way	49.5	49.6	0.1
Plaza Drive	South of Admiral Callaghan Lane	50.8	50.9	0.1
Turner Parkway	East of Admiral Callaghan Lane	64.3	64.4	0.1
Admiral Callaghan Lane	South of Turner Parkway	59.0	59.3	0.3
Turner Parkway	East of Plaza Drive	57.1	57.1	0.0
Redwood Parkway	West of Ascot Parkway	60.7	60.8	0.1
Oakwood Avenue	South of Redwood Parkway	58.5	58.6	0.1

Based upon the **Tables 3-7** data, the proposed project is predicted to result in an increase in a maximum traffic noise level increase of 0.6 dBA.

EVALUATION OF PROJECT OPERATIONAL NOISE ON EXISTING SENSITIVE RECEPTORS

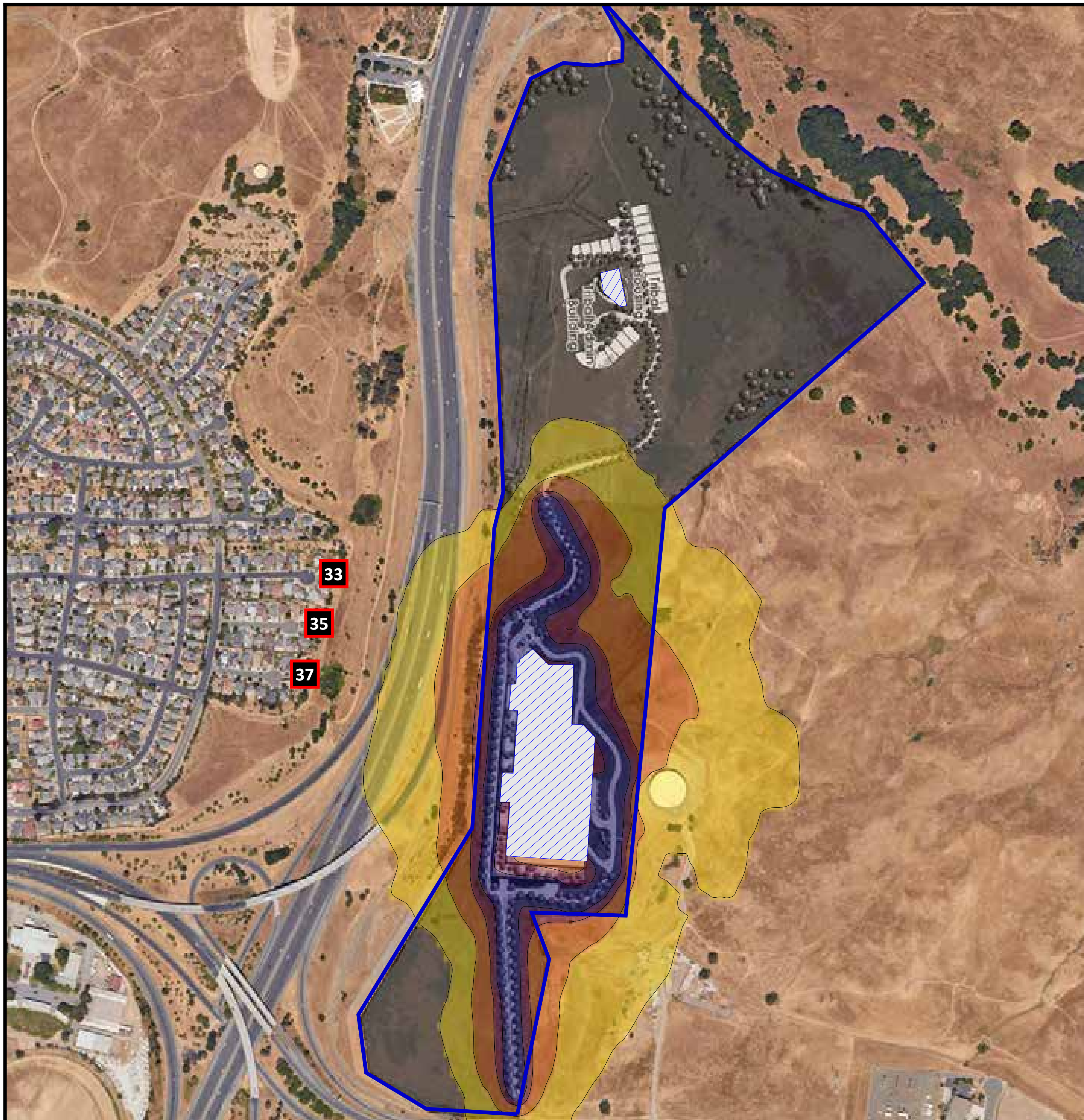
Project site traffic circulation and HVAC noise are considered to be the primary noise sources for this project. The following is a list of assumptions used for the noise modeling. The data used is based upon a combination of manufacturer's provided data and Saxelby Acoustics data from similar operations.

On-Site Circulation: The project is projected to generate 8,551 daily trips with 740 trips in the evening peak hour (Abrams Associates). Parking lot movements are predicted to generate a sound exposure level (SEL) of 71 dBA SEL at 50 feet for cars and 85 dBA SEL at 50 feet for trucks. Saxelby Acoustics data.

Casino HVAC: Assumes ten ten-ton HVAC units servicing the proposed casino. The units were assumed to have a sound level rating of 100 dBA. Steady state HVAC noise does not fluctuate greatly, so exceedances of the City's maximum noise level standard are not predicted to occur. Manufacturer's data.

Residential HVAC: Assumes a single three-ton HVAC unit for each residential unit. The units were assumed to have a sound level rating of 70 dBA (manufacturer's data). Steady state HVAC noise does not fluctuate greatly, so exceedances of the City's maximum noise level standard are not predicted to occur.

Saxelby Acoustics used the SoundPLAN noise prediction model. Inputs to the model included sound power levels for the proposed amenities, existing and proposed buildings, terrain type, and locations of sensitive receptors. These predictions are made in accordance with International Organization for Standardization (ISO) standard 9613-2:1996 (Acoustics – Attenuation of sound during propagation outdoors). ISO 9613 is the most commonly used method for calculating exterior noise propagation. **Figures 3-5** shows the noise level contours resulting from operation of the project.



Scotts Valley Development Project

City of Vallejo, California

Figure 3

Scenario A
Project Operational Noise Contours
Leq,d, dB(A)

Noise Level, dB(A)

45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	

Legend

- Project Building
- Existing Building
- Project Site

Scale 1:700

0 100 200 400 600 800 feet

N

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Figure 4

Scenario B
Project Operational Noise Contours
Leq,d, dB(A)

Noise Level, dB(A)

45 < <= 50
50 < <= 55
55 < <= 60
60 <

Legend

Project Building
Existing Building
Project Site

Scale 1:320

0 50 100 200 300 400 feet

N

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Figure 5

Scenario C
Project Operational Noise Contours
Leq,d, dB(A)

Noise Level, dB(A)

45 <	<=	50
50 <	<=	55
55 <	<=	60
60 <		

Legend

Project Building
Existing Building
Project Site

Scale 1:700

0 100200 400 600 800 feet

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CONSTRUCTION NOISE ENVIRONMENT

During the construction of the proposed project, noise from construction activities would temporarily add to the noise environment in the project vicinity. As shown in **Table 8**, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

TABLE 8: CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Maximum Level, dBA at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Roadway Construction Noise Model User's Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

CONSTRUCTION VIBRATION ENVIRONMENT

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and parking lot construction occur. **Table 9** shows the typical vibration levels produced by construction equipment.

TABLE 9: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: Transit Noise and Vibration Impact Assessment Guidelines. Federal Transit Administration. May 2006.

REGULATORY CONTEXT

FEDERAL

There are no federal regulations related to noise that apply to the Proposed Project.

STATE

California Environmental Quality Act

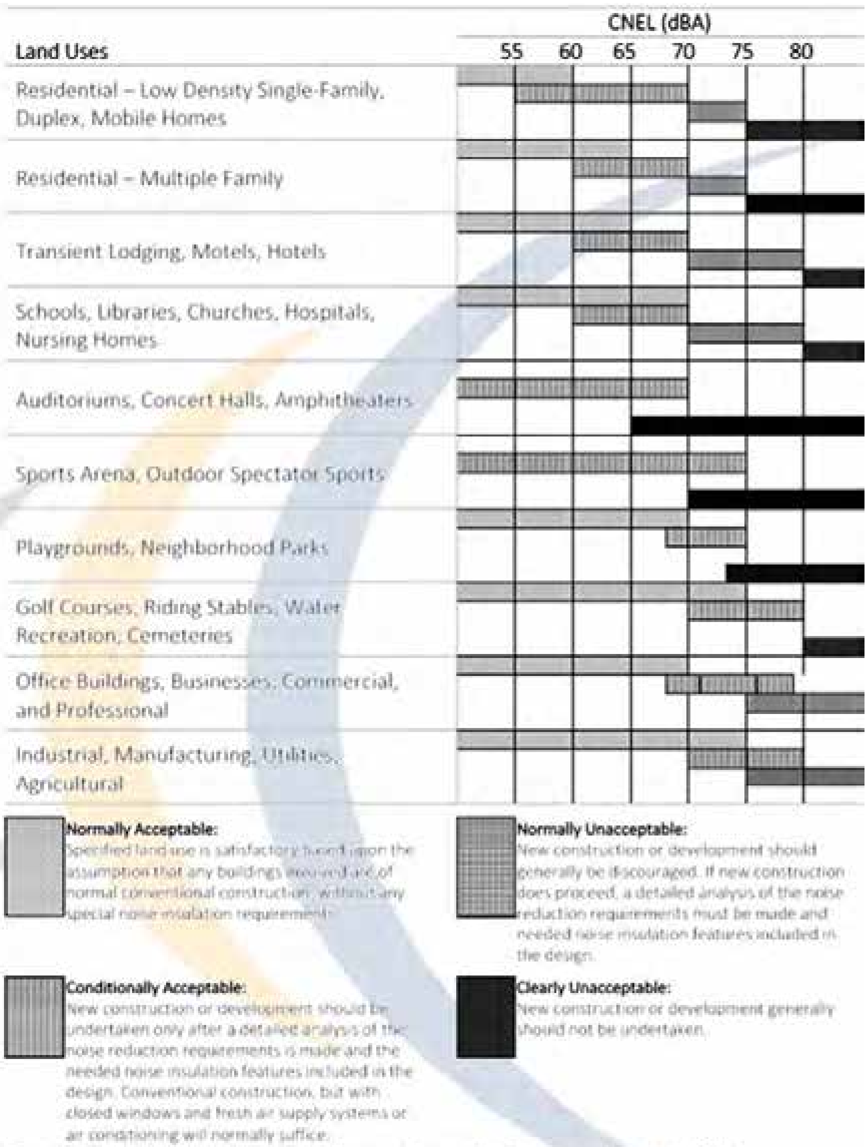
The proposed project is not subject to the requirements of the California Environmental Quality Act (CEQA). However, for context, CEQA requirements are discussed in this report. The 2024 CEQA Statute & Guidelines Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels. CEQA standards are discussed in more detail under the Thresholds of Significance section.

LOCAL

The proposed project is not subject to the requirements of the City of Vallejo. However, for context the City's noise standards are reviewed in this report.

City of Vallejo General Plan

TABLE 10: CALIFORNIA LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS



Source: Governor's Office of Planning and Research, General Plan Guidelines, November 2003

Action NBE-5.13C Update City regulations to restrict the allowable hours to between 7 AM and 7 PM on weekdays for construction, demolition, maintenance, and loading/unloading activities that may impact noise-sensitive land uses.

Action NBE-5.14A	Update City regulations to establish quantified vibration level limits similar to commonly used guidelines found in the Federal Transit Administration document "Transit Noise and Vibration Impact Assessment" (2006).
Action NBE-5.15A	For new single-family residential projects, use a standard of 60 L_{dn} for exterior noise in private use areas, and require appropriate impact mitigation.
Action NBE-5.15B	For new multi-family residential projects, use a standard of 65 L_{dn} in outdoor areas, excluding balconies, and require appropriate impact mitigation.
Action NBE-5.15C	For new mixed-use projects that include a residential component, use a standard of 65 L_{dn} in outdoor areas, excluding balconies, and require the design to minimize commercial noise intrusion into residential areas, including by separating residential areas from noise-generating sources such as mechanical equipment, entertainment facilities, gathering places, loading bays, parking lots, driveways, and trash enclosures to the extent reasonably feasible.
Action NBE-5.15D	Require maximum interior noise levels at 45 L_{dn} in all new residential units, and require appropriate impact mitigation.
Action NBE-5.15E	When approving new development, limit project-related noise increases to the following for permanent stationary and transportation-related noise sources: • no more than 10 dB in non-residential areas; • no more than 5 dB in residential areas where the with project noise level is less than the maximum "normally acceptable" level in the Noise and Land Use Compatibility figure; and • no more than 3 dB where the with-project noise level exceeds the "normally acceptable" level in Noise and Land Use Compatibility figure.

City of Vallejo Municipal Code: 16.502.09 - Noise.

2. Noise standards. Table 16.502-C (**Table 11**) classifies uses and facilities and establishes exterior and interior noise standards applicable to all uses and facilities in each classification that is not exempt from these requirements pursuant to Subsection B. The requirements impose limits on regularly occurring noise for the specified time periods, averaged over an hour, and do not apply to incidental, infrequent, or unexpected noise, which are subject to Vallejo Municipal Code Chapter 7.84, Regulations of Noise Disturbances. The prohibitions contained in Municipal Code Chapter 7.84, apply to all land uses and activities in the city, and, in the case of a conflict, the more restrictive provisions apply.

TABLE 11: MAXIMUM NOISE LEVEL BY NOISE ZONE, L_{EQ}

Noise Zoning District	Maximum Noise Level in dBA (level not exceeded more than 30 minutes in any hour)		Maximum Noise Level in dBA (level not to be exceeded more than 5 minutes in any hour)
	Measured at Property Line or District Boundary	Measured at Any Boundary of a Residential Zone	Between 10 PM and 7AM, Measured at Any Boundary of a Residential Zone
Single-Unit Residential	60	60	-
Multiple-Unit Residential	65	65	-
Commercial and Mixed-Use, Medical, Office	70	60	50 or ambient noise level
Light Industrial	75	65	50 or ambient noise level
General Industrial	75	65	50 or ambient noise level
Public Facilities and Community Use	65	60	50 or ambient noise level
Open Space and Recreational Districts	65	60	50 or ambient noise level

CRITERIA FOR ACCEPTABLE VIBRATION

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. **Table 12**, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

Table 12 indicates that the threshold for architectural damage to structures is 0.20 in/sec p.p.v. A threshold of 0.20 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

TABLE 12: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

Peak Particle Velocity		Human Reaction	Effect on Buildings
mm/second	in/second		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of “architectural” damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage

Source: Transportation Related Earthborne Vibrations. Caltrans. TAV-02-01-R9601. February 20, 2002.

IMPACTS AND MITIGATION MEASURES

Thresholds of Significance

There are no specific Federal thresholds applicable to the proposed project. However, as discussed earlier CEQA guidance and review of local noise standards are considered in this report for context. Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis. In addition to CEQA guidance, increased criteria from the Federal Interagency Committee on Noise (FICON) are also considered, as discussed below. Specific CEQA thresholds include the following:

Would the project:

a. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b. Generate excessive groundborne vibration or groundborne noise levels?

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project is not located within two miles of a public or private airport, therefore item "c" is not discussed any further in this study.

Noise Level Increase Criteria for Long-Term Project-Related Noise Level Increases

The California Environmental Quality Act (CEQA) guidelines define a significant impact of a project if it "increases substantially the ambient noise levels for adjoining areas." Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project noise conditions. **Table 13** is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}.

TABLE 13: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE

Ambient Noise Level Without Project, L_{dn}	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: Federal Interagency Committee on Noise (FICON).

Based on the **Table 13** data, an increase in the traffic noise level of 5 dB or more would be significant where the pre-project noise levels are less than 60 dB L_{dn}, or 3 dB or more where existing noise levels are between 60 to 65 dB L_{dn}. Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 65 dB L_{dn}. The rationale for the **Table 13** criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

Temporary Construction Noise Impacts

There are no specific thresholds for construction noise that are applicable to the proposed project. For context, local and state of California standards are discussed below.

With temporary noise impacts (construction), identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, and the absolute change in decibel levels. Per the City of Vallejo General Plan, construction activities operating between 7:00 p.m. and 7:00 a.m. Monday through Friday are exempt from the ordinance.

The City has not adopted any formal standard for evaluating temporary construction noise which occurs within allowable hours. For short-term noise associated with Project construction, Saxelby Acoustics recommends use of the Caltrans increase criteria of 12 dBA (Caltrans Traffic Noise Protocol, 2020), applied to existing residential receptors in the project vicinity. This level of increase is approximately equivalent to a doubling of sound energy and has been the standard of significance for Caltrans projects at the state level for many years. Application of this standard to construction activities is considered reasonable considering the temporary nature of construction activities.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

Impact 1: ***Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?***

Traffic Noise Increases at Off-Site Receptors

The FICON guidelines specify criteria to determine the significance of traffic noise impacts. Where existing traffic noise levels are greater than 65 dB L_{dn}, a +1.5 dB L_{dn} increase in roadway noise levels will be considered significant. According to **Tables 3-7**, the maximum increase is traffic noise at the nearest sensitive receptor is predicted to be 0.6 dBA. Therefore, impacts resulting from increased traffic noise would be considered ***less-than-significant***, and no mitigation is required.

Operational Noise at Existing Sensitive Receptors

As shown on **Figures 3-5**, the project is predicted to expose nearby residences to noise levels up to 37 dBA, L_{eq} during both daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) hours. The predicted project noise levels would meet the City of Vallejo noise standard for non-transportation noise sources of 60 dBA, $L_{eq.}$ The predicted noise levels are also well below the measured nighttime noise levels of 54-59 dBA L_{eq} as shown in **Table 2** for site LT-4. Therefore, the project is not predicted to cause a substantial increase in ambient noise levels at the sensitive receptors closest to the project site.

This is a ***less-than-significant*** impact, and no mitigation is required.

Construction Noise

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. As indicated in **Table 8,** activities involved in construction would generate maximum noise levels ranging from 76 to 90 dBA L_{max} at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours.

The City of Vallejo General Plan exempts construction noise from the noise ordinance between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, provided that either no individual piece of equipment shall produce noise levels greater than 83 dBA at 25 feet or noise levels outside the property plane are less than 86 dBA. As shown in **Table 8**, construction equipment that may be used in the development of the project has the potential to exceed 83 dBA at 25 feet. However, the majority of project construction would occur away from the property boundary, therefore limiting noise levels at the property plane to below 86 dBA.

Caltrans defines a significant increase due to noise as an increase of 12 dBA over existing ambient noise levels; Saxelby Acoustics used this criterion to evaluate increases due to construction noise associated with the project. As shown in **Table 8**, construction equipment is predicted to generate noise levels of up to 90 dBA L_{max} at 50 feet. Construction noise is evaluated as occurring at the center of the site to represent average noise levels generated over the duration of construction across the project site. The nearest residential uses are located approximately 1,300 feet as measured from the center of the project site. At this distance, maximum construction noise levels would be up to 62 dBA. The average daytime maximum noise levels in the vicinity of the closest sensitive receptors was measured to be 69-72 dBA L_{max}, as shown in **Table 2** for site LT-4. Therefore, project construction would not cause an increase of greater than 12 dBA over existing ambient noise levels.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from the construction site. This noise increase would be of short duration and would occur during daytime hours.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Therefore, impacts resulting from noise levels temporarily exceeding the threshold of significance due to construction would be considered ***potentially significant***. Recommended measure 1(a) would reduce construction noise impacts to ***less-than-significant*** relative to the thresholds discussed in this report.

Recommended Measures

1(a) The project shall establish the following as conditions of approval for any permit that results in the use of construction equipment:

- Construction shall be limited to between 7 AM and 7 PM on weekdays for construction, demolition, maintenance, and loading/unloading activities that may impact noise-sensitive land uses.
- All construction equipment powered by internal combustion engines shall be properly muffled and maintained.
- Quiet construction equipment, particularly air compressors, are to be selected whenever possible.
- All stationary noise-generating construction equipment such as generators or air compressors are to be located as far as is practical from existing residences. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- Unnecessary idling of internal combustion engines is prohibited.
- The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

Timing/Implementation: Implemented prior to approval of grading and/or building permits

Implementation of recommended measure 1(a) would help to reduce construction-generated noise levels. With mitigation, this impact would be considered ***less-than-significant*** relative to the thresholds discussed in this report.

Impact 2: Would the project generate excessive groundborne vibration or groundborne noise levels?

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

The **Table 9** data indicates that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located further than 26 feet from typical construction activities. At distances greater than 26 feet construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

This is a **less-than-significant** impact and no mitigation is required relative to the thresholds discussed in this report.

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Appendix A: Acoustical Terminology

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

ASTC Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.

Attenuation The reduction of an acoustic signal.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

Decibel or dB Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.

DNL See definition of Ldn.

IIC Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).

Ldn Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

Leq Equivalent or energy-averaged sound level.

Lmax The highest root-mean-square (RMS) sound level measured over a given period of time.

L(n) The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.

Loudness A subjective term for the sensation of the magnitude of sound.

NIC Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.

NNIC Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.

Noise Unwanted sound.

NRC Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.

RT60 The time it takes reverberant sound to decay by 60 dB once the source has been removed.

Sabin The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.

SEL Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.

SPC Speech Privacy Class. SPC is a method of rating speech privacy in buildings. It is designed to measure the degree of speech privacy provided by a closed room, indicating the degree to which conversations occurring within are kept private from listeners outside the room.

STC Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.

Threshold of Hearing The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.

Threshold of Pain Approximately 120 dB above the threshold of hearing.

Impulsive Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.

Simple Tone Any sound which can be judged as audible as a single pitch or set of single pitches.

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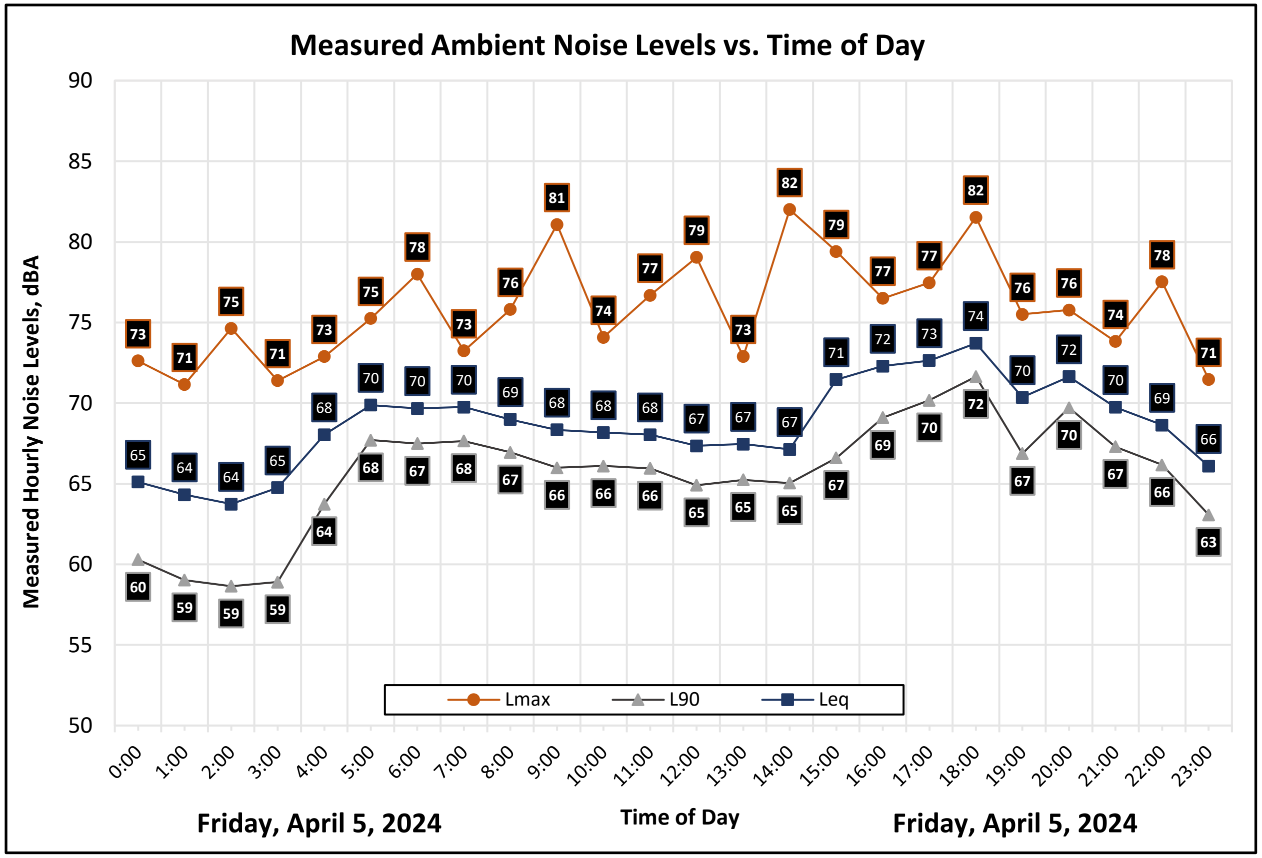
Appendix B: Continuous Ambient Noise Measurement Results

Appendix B1a: Continuous Noise Monitoring Results

Site: LT-1
Project: Scotts Valley Development Project
Location: North West of Project Site
Coordinates: (10S 568733 4222872)
Meter: LDL 820-1
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Friday, April 5, 2024	0:00	65	73	65	60
Friday, April 5, 2024	1:00	64	71	64	59
Friday, April 5, 2024	2:00	64	75	63	59
Friday, April 5, 2024	3:00	65	71	64	59
Friday, April 5, 2024	4:00	68	73	68	64
Friday, April 5, 2024	5:00	70	75	70	68
Friday, April 5, 2024	6:00	70	78	70	67
Friday, April 5, 2024	7:00	70	73	70	68
Friday, April 5, 2024	8:00	69	76	69	67
Friday, April 5, 2024	9:00	68	81	68	66
Friday, April 5, 2024	10:00	68	74	68	66
Friday, April 5, 2024	11:00	68	77	68	66
Friday, April 5, 2024	12:00	67	79	67	65
Friday, April 5, 2024	13:00	67	73	67	65
Friday, April 5, 2024	14:00	67	82	67	65
Friday, April 5, 2024	15:00	71	79	71	67
Friday, April 5, 2024	16:00	72	77	72	69
Friday, April 5, 2024	17:00	73	77	72	70
Friday, April 5, 2024	18:00	74	82	74	72
Friday, April 5, 2024	19:00	70	76	70	67
Friday, April 5, 2024	20:00	72	76	71	70
Friday, April 5, 2024	21:00	70	74	70	67
Friday, April 5, 2024	22:00	69	78	68	66
Friday, April 5, 2024	23:00	66	71	66	63

Statistics	Leq	Lmax	L50	L90
Day Average	70	77	70	67
Night Average	67	74	66	63
Day Low	67	73	67	65
Day High	74	82	74	72
Night Low	64	71	63	59
Night High	70	78	70	68
Ldn	74	Day %		80
CNEL	74	Night %		20

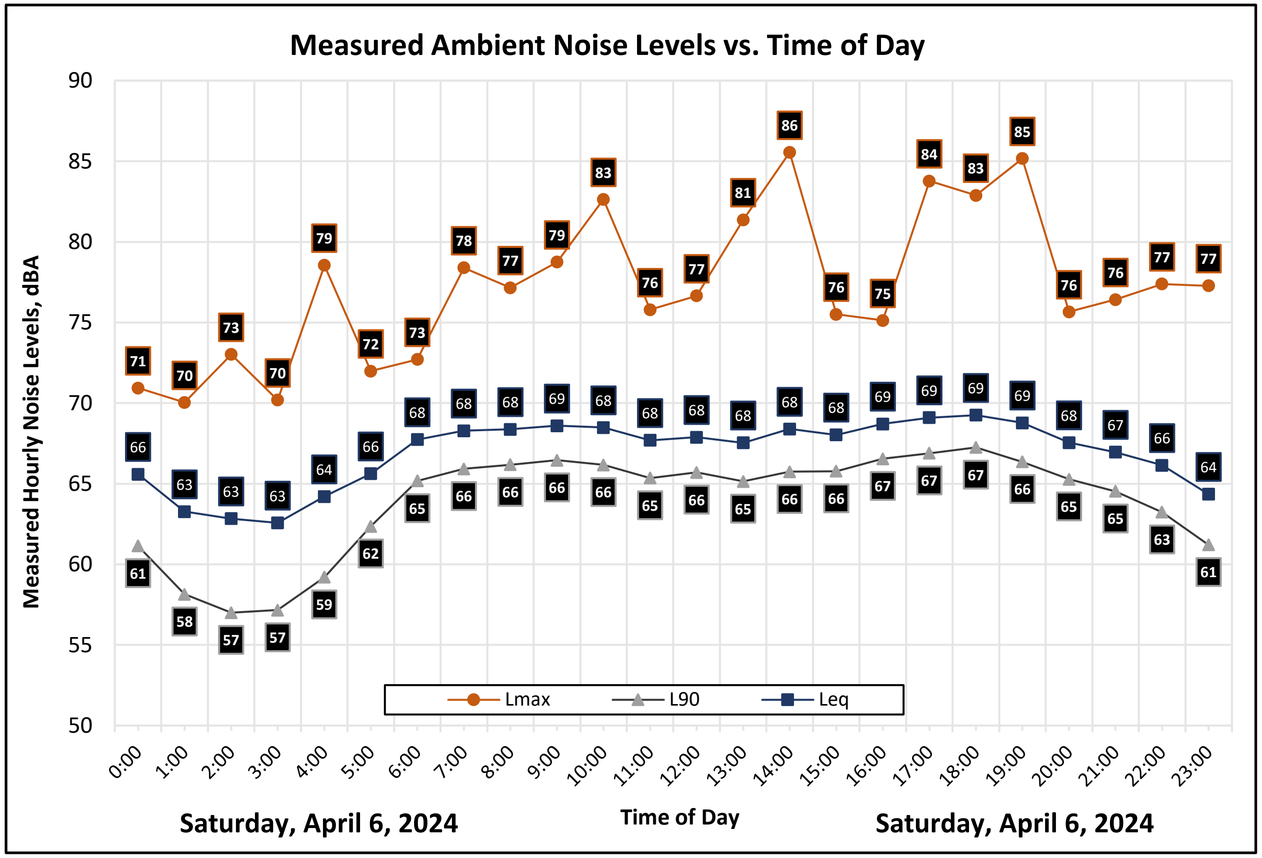


Appendix B1b: Continuous Noise Monitoring Results

Site: LT-1
Project: Scotts Valley Development Project
Meter: LDL 820-1
Location: North West of Project Site
Calibrator: CAL200
Coordinates: (10S 568733 4222872)

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Saturday, April 6, 2024	0:00	66	71	65	61
Saturday, April 6, 2024	1:00	63	70	63	58
Saturday, April 6, 2024	2:00	63	73	62	57
Saturday, April 6, 2024	3:00	63	70	62	57
Saturday, April 6, 2024	4:00	64	79	63	59
Saturday, April 6, 2024	5:00	66	72	65	62
Saturday, April 6, 2024	6:00	68	73	68	65
Saturday, April 6, 2024	7:00	68	78	68	66
Saturday, April 6, 2024	8:00	68	77	68	66
Saturday, April 6, 2024	9:00	69	79	68	66
Saturday, April 6, 2024	10:00	68	83	68	66
Saturday, April 6, 2024	11:00	68	76	67	65
Saturday, April 6, 2024	12:00	68	77	68	66
Saturday, April 6, 2024	13:00	68	81	67	65
Saturday, April 6, 2024	14:00	68	86	68	66
Saturday, April 6, 2024	15:00	68	76	68	66
Saturday, April 6, 2024	16:00	69	75	69	67
Saturday, April 6, 2024	17:00	69	84	69	67
Saturday, April 6, 2024	18:00	69	83	69	67
Saturday, April 6, 2024	19:00	69	85	68	66
Saturday, April 6, 2024	20:00	68	76	67	65
Saturday, April 6, 2024	21:00	67	76	67	65
Saturday, April 6, 2024	22:00	66	77	66	63
Saturday, April 6, 2024	23:00	64	77	64	61

Statistics	Leq	Lmax	L50	L90
Day Average	68	79	68	66
Night Average	65	74	64	61
Day Low	67	75	67	65
Day High	69	86	69	67
Night Low	63	70	62	57
Night High	68	79	68	65
Ldn	72	Day %		81
CNEL	72	Night %		19

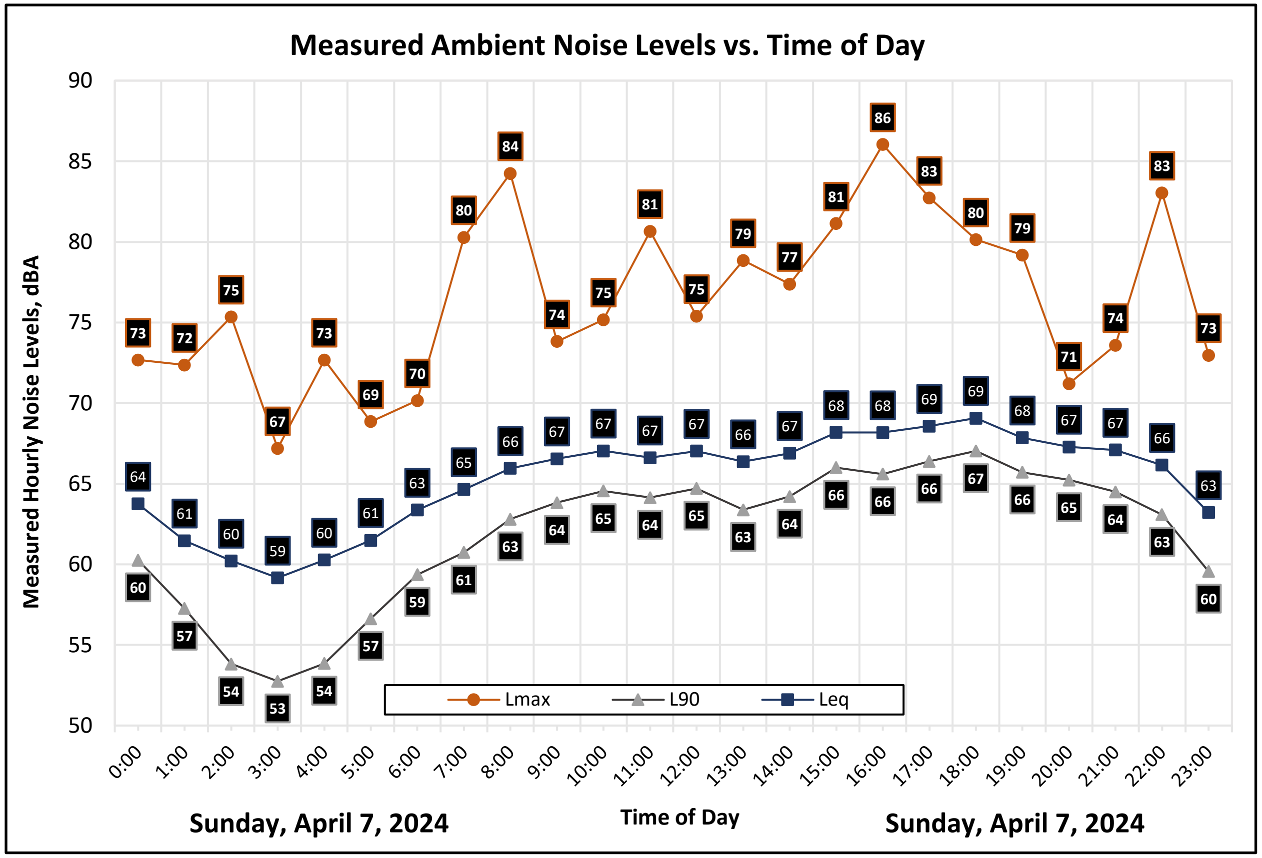


Appendix B1c: Continuous Noise Monitoring Results

Site: LT-1
Project: Scotts Valley Development Project
Meter: LDL 820-1
Location: North West of Project Site
Calibrator: CAL200
Coordinates: (10S 568733 4222872)

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Sunday, April 7, 2024	0:00	64	73	63	60
Sunday, April 7, 2024	1:00	61	72	61	57
Sunday, April 7, 2024	2:00	60	75	59	54
Sunday, April 7, 2024	3:00	59	67	58	53
Sunday, April 7, 2024	4:00	60	73	59	54
Sunday, April 7, 2024	5:00	61	69	61	57
Sunday, April 7, 2024	6:00	63	70	63	59
Sunday, April 7, 2024	7:00	65	80	64	61
Sunday, April 7, 2024	8:00	66	84	65	63
Sunday, April 7, 2024	9:00	67	74	66	64
Sunday, April 7, 2024	10:00	67	75	67	65
Sunday, April 7, 2024	11:00	67	81	66	64
Sunday, April 7, 2024	12:00	67	75	67	65
Sunday, April 7, 2024	13:00	66	79	66	63
Sunday, April 7, 2024	14:00	67	77	67	64
Sunday, April 7, 2024	15:00	68	81	68	66
Sunday, April 7, 2024	16:00	68	86	67	66
Sunday, April 7, 2024	17:00	69	83	68	66
Sunday, April 7, 2024	18:00	69	80	69	67
Sunday, April 7, 2024	19:00	68	79	68	66
Sunday, April 7, 2024	20:00	67	71	67	65
Sunday, April 7, 2024	21:00	67	74	67	64
Sunday, April 7, 2024	22:00	66	83	66	63
Sunday, April 7, 2024	23:00	63	73	63	60

Statistics	Leq	Lmax	L50	L90
Day Average	67	79	67	65
Night Average	62	73	61	57
Day Low	65	71	64	61
Day High	69	86	69	67
Night Low	59	67	58	53
Night High	64	83	66	63
Ldn	69	Day %		87
CNEL	70	Night %		13



Appendix B2a: Continuous Noise Monitoring Results

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Friday, April 5, 2024	0:00	56	64	56	49
Friday, April 5, 2024	1:00	52	62	52	49
Friday, April 5, 2024	2:00	49	67	48	45
Friday, April 5, 2024	3:00	50	59	49	46
Friday, April 5, 2024	4:00	55	66	54	51
Friday, April 5, 2024	5:00	57	65	57	55
Friday, April 5, 2024	6:00	58	66	57	55
Friday, April 5, 2024	7:00	57	62	57	55
Friday, April 5, 2024	8:00	54	61	54	52
Friday, April 5, 2024	9:00	54	63	53	51
Friday, April 5, 2024	10:00	54	64	53	51
Friday, April 5, 2024	11:00	56	69	54	52
Friday, April 5, 2024	12:00	54	62	54	51
Friday, April 5, 2024	13:00	56	70	55	52
Friday, April 5, 2024	14:00	58	67	57	52
Friday, April 5, 2024	15:00	62	81	60	55
Friday, April 5, 2024	16:00	54	61	53	51
Friday, April 5, 2024	17:00	62	72	62	56
Friday, April 5, 2024	18:00	56	64	56	53
Friday, April 5, 2024	19:00	58	68	55	52
Friday, April 5, 2024	20:00	58	69	58	56
Friday, April 5, 2024	21:00	59	71	59	57
Friday, April 5, 2024	22:00	58	68	57	56
Friday, April 5, 2024	23:00	57	68	56	54

Statistics	Leq	Lmax	L50	L90
Day Average	58	67	56	53
Night Average	55	65	54	51
Day Low	54	61	53	51
Day High	62	81	62	57
Night Low	49	59	48	45
Night High	58	68	57	56
Ldn	62	Day %		77
CNEL	62	Night %		23

Site: LT-2

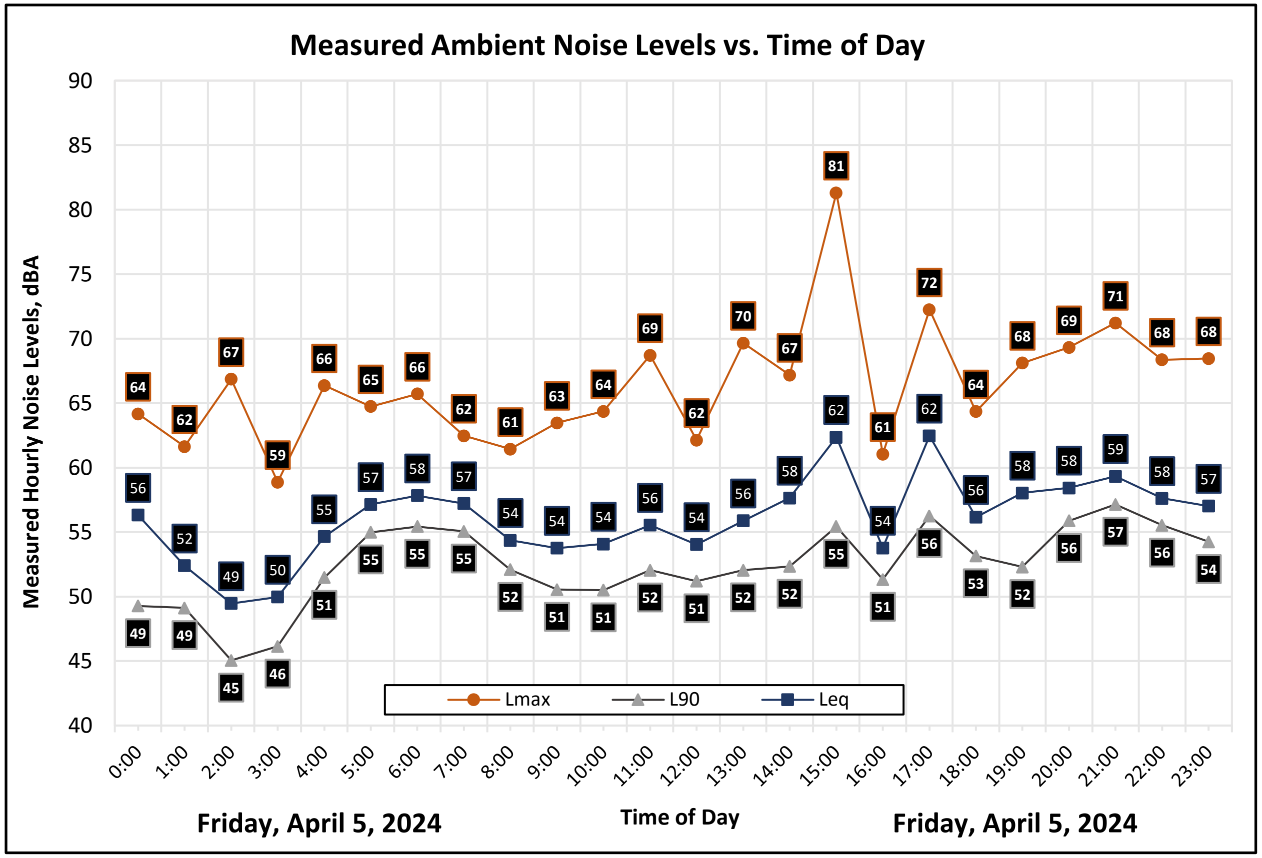
Project: Scotts Valley Development Project

Meter: LDL 820-5

Location: South West of Project Site

Calibrator: CAL200

Coordinates: (10S 568604 4221742)

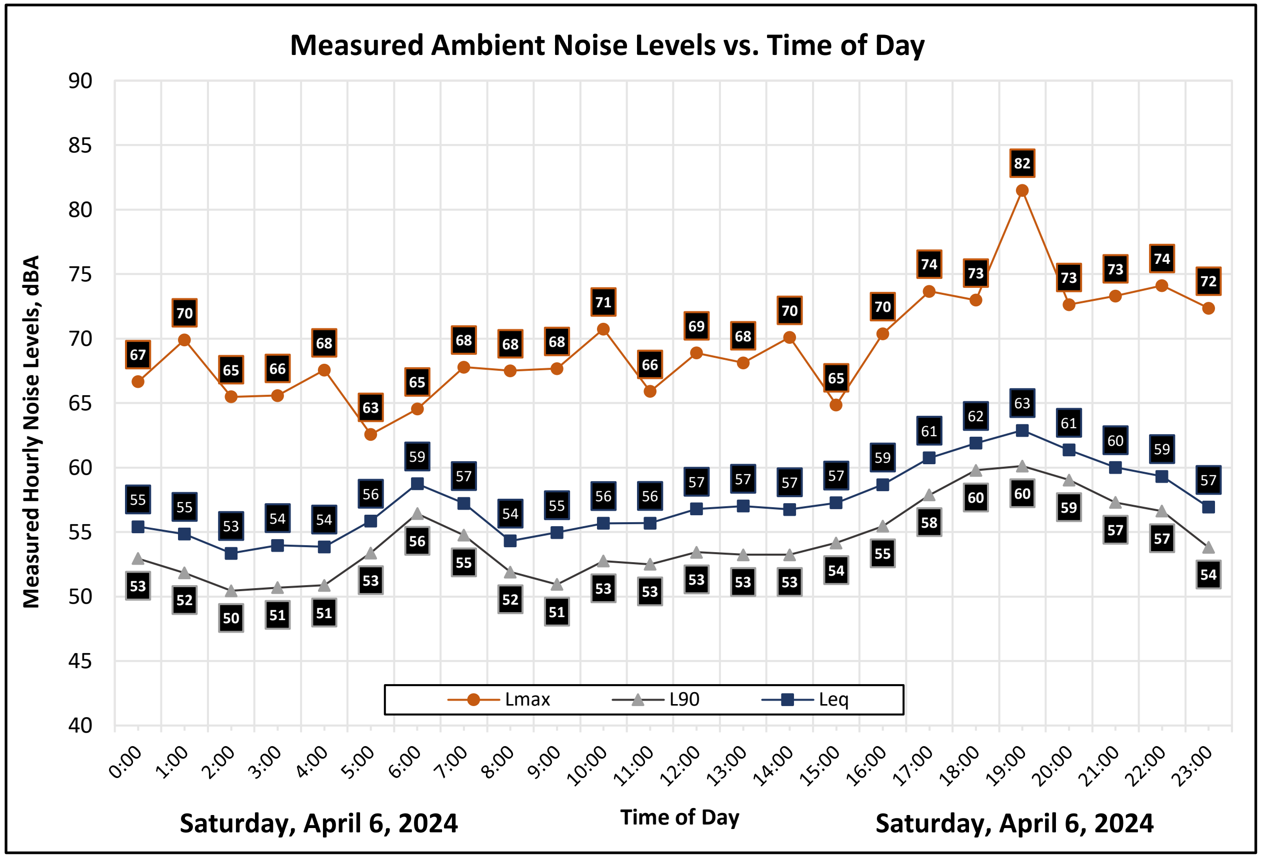


Appendix B2b: Continuous Noise Monitoring Results

Site: LT-2
Project: Scotts Valley Development Project
Meter: LDL 820-5
Location: South West of Project Site
Calibrator: CAL200
Coordinates: (10S 568604 4221742)

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Saturday, April 6, 2024	0:00	55	67	55	53
Saturday, April 6, 2024	1:00	55	70	54	52
Saturday, April 6, 2024	2:00	53	65	53	50
Saturday, April 6, 2024	3:00	54	66	53	51
Saturday, April 6, 2024	4:00	54	68	53	51
Saturday, April 6, 2024	5:00	56	63	56	53
Saturday, April 6, 2024	6:00	59	65	58	56
Saturday, April 6, 2024	7:00	57	68	57	55
Saturday, April 6, 2024	8:00	54	68	54	52
Saturday, April 6, 2024	9:00	55	68	54	51
Saturday, April 6, 2024	10:00	56	71	55	53
Saturday, April 6, 2024	11:00	56	66	55	53
Saturday, April 6, 2024	12:00	57	69	56	53
Saturday, April 6, 2024	13:00	57	68	56	53
Saturday, April 6, 2024	14:00	57	70	56	53
Saturday, April 6, 2024	15:00	57	65	57	54
Saturday, April 6, 2024	16:00	59	70	58	55
Saturday, April 6, 2024	17:00	61	74	60	58
Saturday, April 6, 2024	18:00	62	73	62	60
Saturday, April 6, 2024	19:00	63	82	62	60
Saturday, April 6, 2024	20:00	61	73	61	59
Saturday, April 6, 2024	21:00	60	73	59	57
Saturday, April 6, 2024	22:00	59	74	59	57
Saturday, April 6, 2024	23:00	57	72	56	54

Statistics	Leq	Lmax	L50	L90
Day Average	59	70	57	55
Night Average	56	68	55	53
Day Low	54	65	54	51
Day High	63	82	62	60
Night Low	53	63	53	50
Night High	59	74	59	57
Ldn	62	Day %		80
CNEL	63	Night %		20



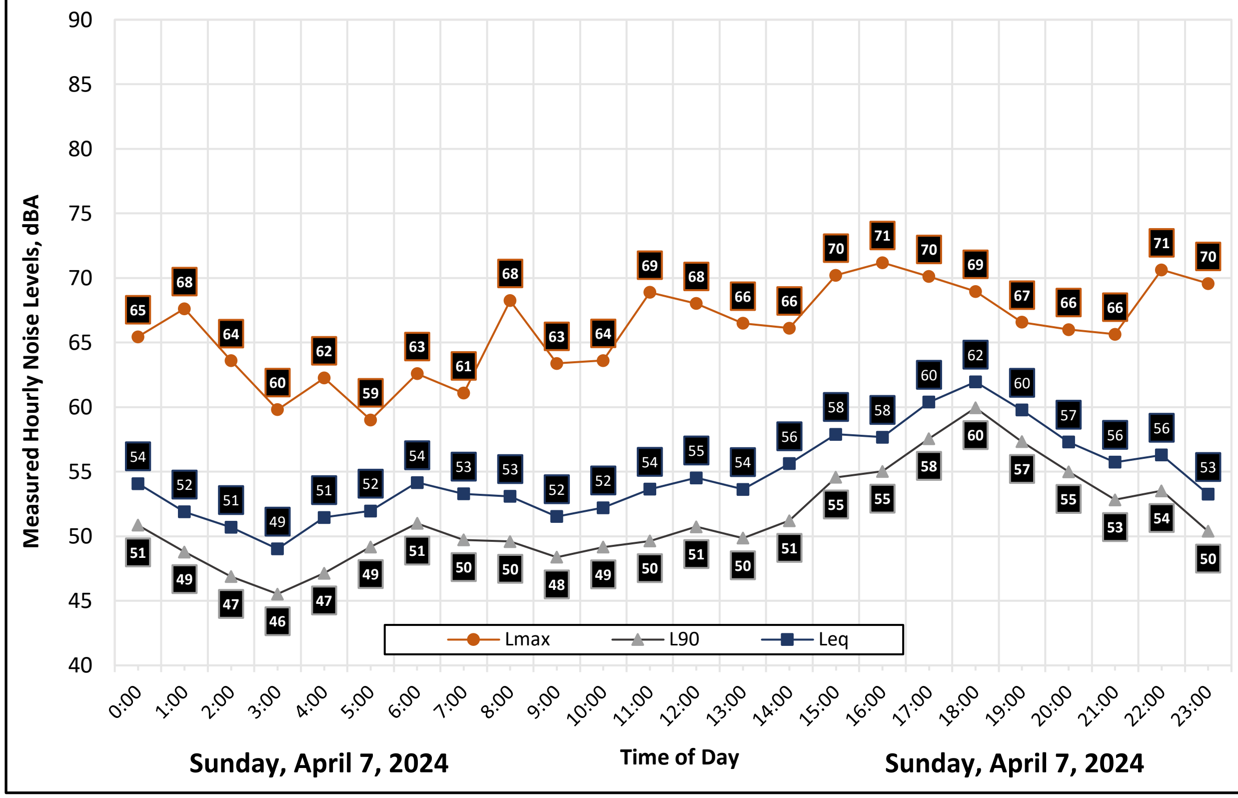
Appendix B2c: Continuous Noise Monitoring Results

Site: LT-2
Project: Scotts Valley Development Project **Meter:** LDL 820-5
Location: South West of Project Site **Calibrator:** CAL200
Coordinates: (10S 568604 4221742)

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Sunday, April 7, 2024	0:00	54	65	53	51
Sunday, April 7, 2024	1:00	52	68	51	49
Sunday, April 7, 2024	2:00	51	64	50	47
Sunday, April 7, 2024	3:00	49	60	48	46
Sunday, April 7, 2024	4:00	51	62	50	47
Sunday, April 7, 2024	5:00	52	59	52	49
Sunday, April 7, 2024	6:00	54	63	53	51
Sunday, April 7, 2024	7:00	53	61	53	50
Sunday, April 7, 2024	8:00	53	68	52	50
Sunday, April 7, 2024	9:00	52	63	51	48
Sunday, April 7, 2024	10:00	52	64	51	49
Sunday, April 7, 2024	11:00	54	69	52	50
Sunday, April 7, 2024	12:00	55	68	53	51
Sunday, April 7, 2024	13:00	54	66	53	50
Sunday, April 7, 2024	14:00	56	66	55	51
Sunday, April 7, 2024	15:00	58	70	57	55
Sunday, April 7, 2024	16:00	58	71	57	55
Sunday, April 7, 2024	17:00	60	70	60	58
Sunday, April 7, 2024	18:00	62	69	62	60
Sunday, April 7, 2024	19:00	60	67	59	57
Sunday, April 7, 2024	20:00	57	66	57	55
Sunday, April 7, 2024	21:00	56	66	55	53
Sunday, April 7, 2024	22:00	56	71	55	54
Sunday, April 7, 2024	23:00	53	70	53	50

Statistics	Leq	Lmax	L50	L90
Day Average	57	67	55	53
Night Average	52	65	52	49
Day Low	52	61	51	48
Day High	62	71	62	60
Night Low	49	59	48	46
Night High	54	71	55	54
Ldn	59	Day %		85
CNEL	60	Night %		15

Measured Ambient Noise Levels vs. Time of Day

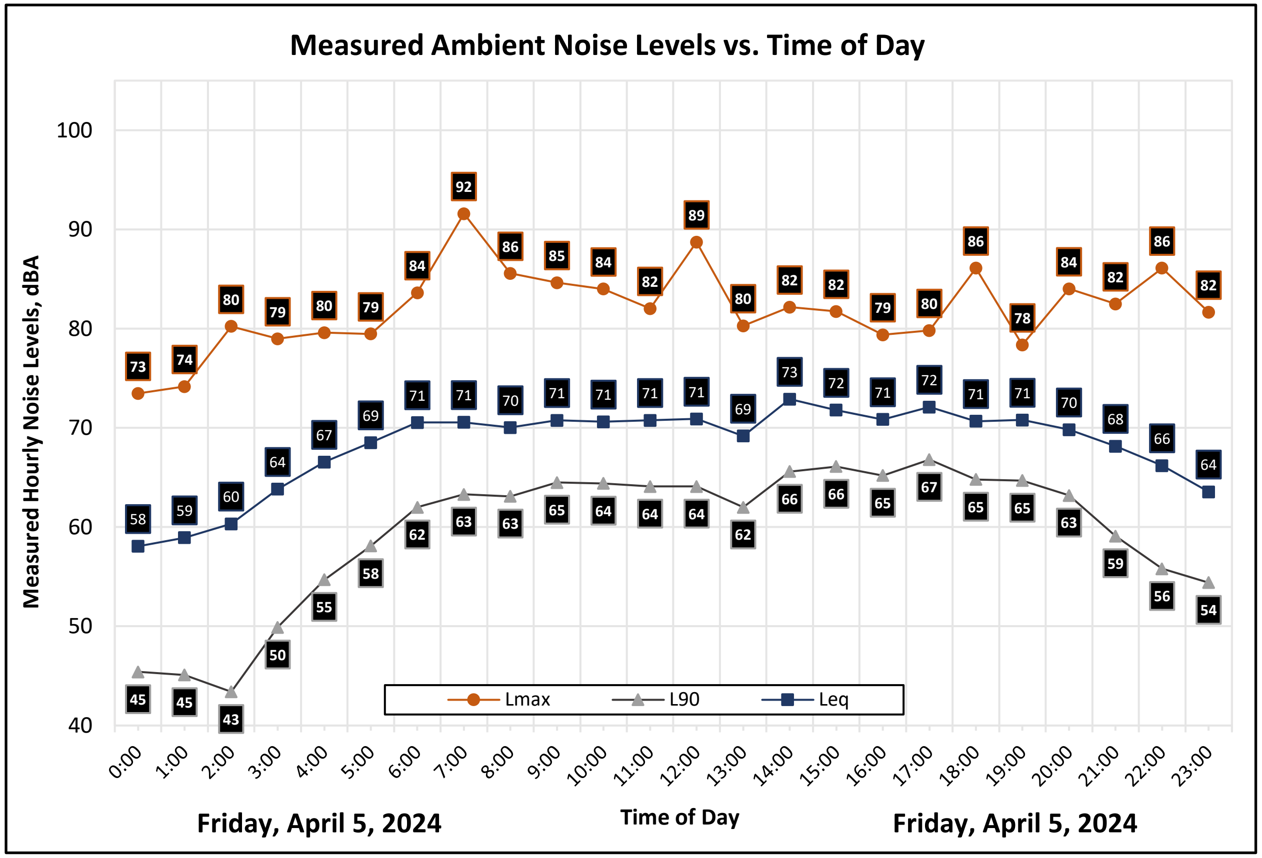


Appendix B3a: Continuous Noise Monitoring Results

Site: LT-3
Project: Scotts Valley Development Project
Location: South Side of Project Site
Coordinates: 10S 568693 4221406
Meter: LDL 821-1
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Friday, April 5, 2024	0:00	58	73	49	45
Friday, April 5, 2024	1:00	59	74	50	45
Friday, April 5, 2024	2:00	60	80	50	43
Friday, April 5, 2024	3:00	64	79	58	50
Friday, April 5, 2024	4:00	67	80	64	55
Friday, April 5, 2024	5:00	69	79	66	58
Friday, April 5, 2024	6:00	71	84	69	62
Friday, April 5, 2024	7:00	71	92	69	63
Friday, April 5, 2024	8:00	70	86	69	63
Friday, April 5, 2024	9:00	71	85	70	65
Friday, April 5, 2024	10:00	71	84	70	64
Friday, April 5, 2024	11:00	71	82	70	64
Friday, April 5, 2024	12:00	71	89	70	64
Friday, April 5, 2024	13:00	69	80	68	62
Friday, April 5, 2024	14:00	73	82	72	66
Friday, April 5, 2024	15:00	72	82	71	66
Friday, April 5, 2024	16:00	71	79	70	65
Friday, April 5, 2024	17:00	72	80	72	67
Friday, April 5, 2024	18:00	71	86	70	65
Friday, April 5, 2024	19:00	71	78	70	65
Friday, April 5, 2024	20:00	70	84	69	63
Friday, April 5, 2024	21:00	68	82	67	59
Friday, April 5, 2024	22:00	66	86	64	56
Friday, April 5, 2024	23:00	64	82	60	54

Statistics	Leq	Lmax	L50	L90
Day Average	71	83	70	64
Night Average	66	80	59	52
Day Low	68	78	67	59
Day High	73	92	72	67
Night Low	58	73	49	43
Night High	71	86	69	62
Ldn	73	Day %		86
CNEL	74	Night %		14

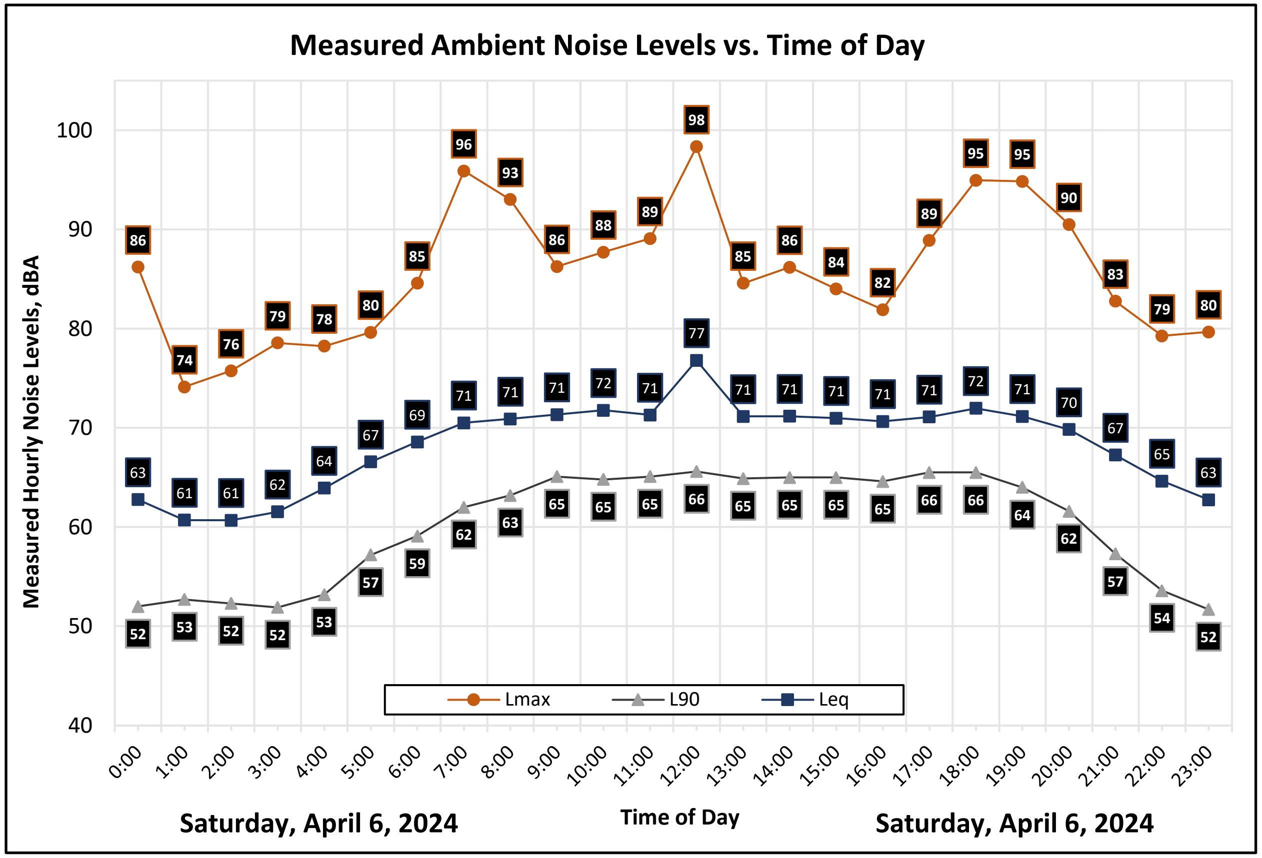


Appendix B3b: Continuous Noise Monitoring Results

Site: LT-3
Project: Scotts Valley Development Project
Location: South Side of Project Site
Coordinates: 10S 568693 4221406
Meter: LDL 821-1
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Saturday, April 6, 2024	0:00	63	86	56	52
Saturday, April 6, 2024	1:00	61	74	56	53
Saturday, April 6, 2024	2:00	61	76	56	52
Saturday, April 6, 2024	3:00	62	79	56	52
Saturday, April 6, 2024	4:00	64	78	58	53
Saturday, April 6, 2024	5:00	67	80	64	57
Saturday, April 6, 2024	6:00	69	85	67	59
Saturday, April 6, 2024	7:00	71	96	68	62
Saturday, April 6, 2024	8:00	71	93	69	63
Saturday, April 6, 2024	9:00	71	86	70	65
Saturday, April 6, 2024	10:00	72	88	71	65
Saturday, April 6, 2024	11:00	71	89	71	65
Saturday, April 6, 2024	12:00	77	98	71	66
Saturday, April 6, 2024	13:00	71	85	71	65
Saturday, April 6, 2024	14:00	71	86	70	65
Saturday, April 6, 2024	15:00	71	84	70	65
Saturday, April 6, 2024	16:00	71	82	70	65
Saturday, April 6, 2024	17:00	71	89	70	66
Saturday, April 6, 2024	18:00	72	95	71	66
Saturday, April 6, 2024	19:00	71	95	70	64
Saturday, April 6, 2024	20:00	70	90	68	62
Saturday, April 6, 2024	21:00	67	83	65	57
Saturday, April 6, 2024	22:00	65	79	62	54
Saturday, April 6, 2024	23:00	63	80	58	52

Statistics	Leq	Lmax	L50	L90
Day Average	72	89	70	64
Night Average	64	80	59	54
Day Low	67	82	65	57
Day High	77	98	71	66
Night Low	61	74	56	52
Night High	69	86	67	59
Ldn	73	Day %		91
CNEL	73	Night %		9



Appendix B3c: Continuous Noise Monitoring Results

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Sunday, April 7, 2024	0:00	61	78	56	51
Sunday, April 7, 2024	1:00	60	74	54	49
Sunday, April 7, 2024	2:00	58	74	52	48
Sunday, April 7, 2024	3:00	59	78	51	47
Sunday, April 7, 2024	4:00	61	74	55	50
Sunday, April 7, 2024	5:00	64	78	60	53
Sunday, April 7, 2024	6:00	66	86	63	55
Sunday, April 7, 2024	7:00	69	97	65	57
Sunday, April 7, 2024	8:00	70	90	67	60
Sunday, April 7, 2024	9:00	70	86	68	62
Sunday, April 7, 2024	10:00	71	93	69	63
Sunday, April 7, 2024	11:00	70	82	69	63
Sunday, April 7, 2024	12:00	70	84	70	64
Sunday, April 7, 2024	13:00	70	88	69	62
Sunday, April 7, 2024	14:00	71	88	70	64
Sunday, April 7, 2024	15:00	71	85	70	64
Sunday, April 7, 2024	16:00	72	97	70	64
Sunday, April 7, 2024	17:00	71	82	70	66
Sunday, April 7, 2024	18:00	70	87	69	63
Sunday, April 7, 2024	19:00	73	102	67	60
Sunday, April 7, 2024	20:00	68	82	66	59
Sunday, April 7, 2024	21:00	67	85	64	57
Sunday, April 7, 2024	22:00	64	91	60	53
Sunday, April 7, 2024	23:00	60	76	54	50

Statistics	Leq	Lmax	L50	L90
Day Average	70	88	68	62
Night Average	62	79	56	51
Day Low	67	82	64	57
Day High	73	102	70	66
Night Low	58	74	51	47
Night High	66	91	63	55
Ldn	71	Day %		92
CNEL	72	Night %		8

Site: LT-3

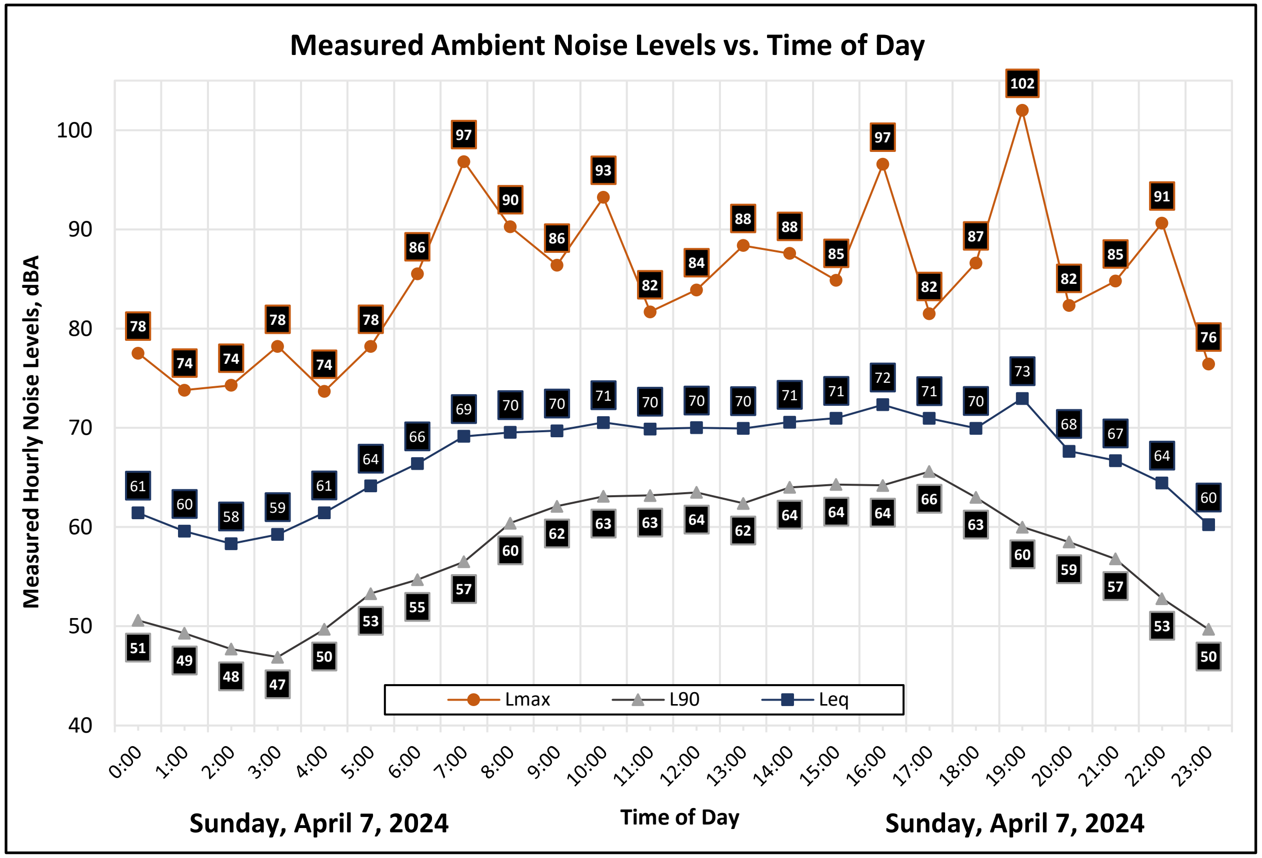
Project: Scotts Valley Development Project

Meter: LDL 821-1

Location: South Side of Project Site

Calibrator: CAL200

Coordinates: 10S 568693 4221406

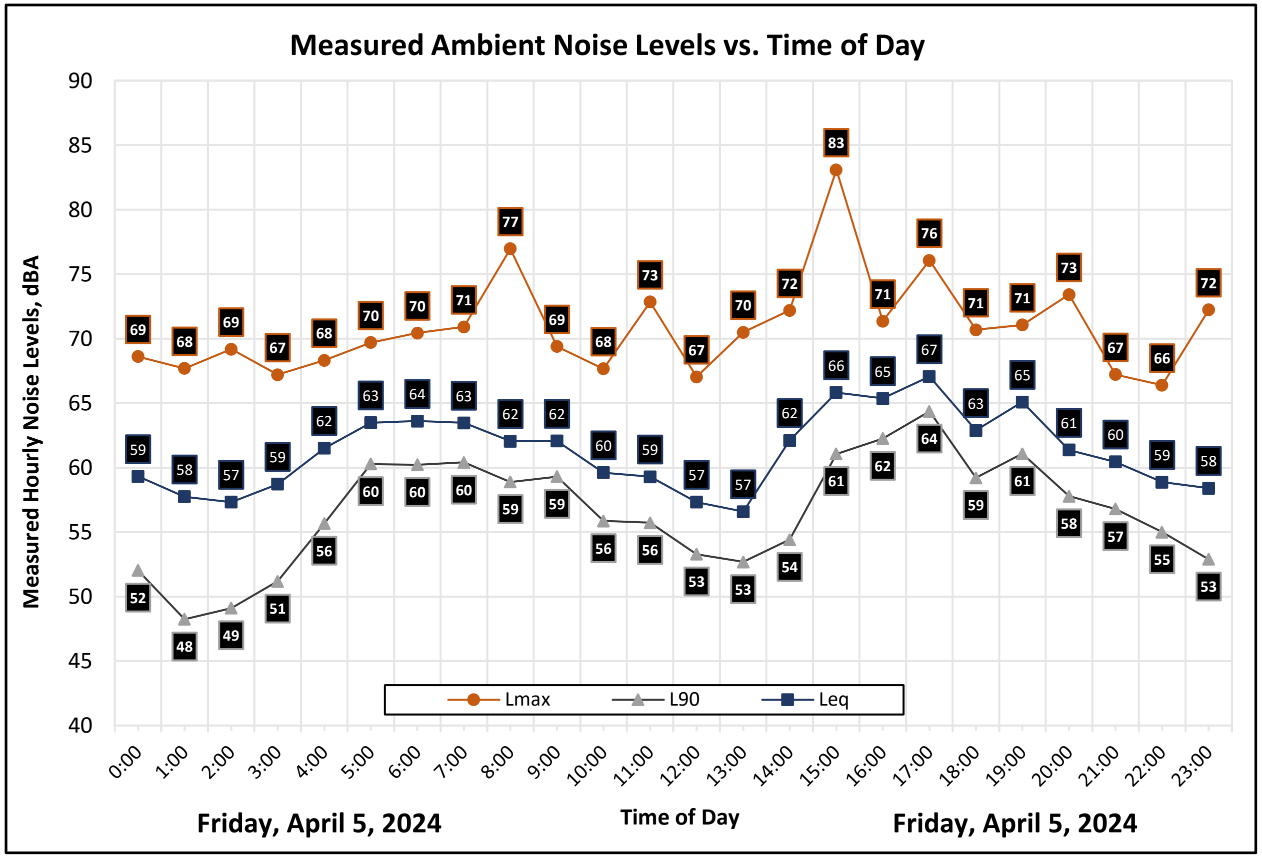


Appendix B3a: Continuous Noise Monitoring Results

Site: LT-4
Project: Scotts Valley Development Project
Location: South of Project Site
Coordinates: 10S 568410 4221990
Meter: LDL 820-8
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Friday, April 5, 2024	0:00	59	69	58	52
Friday, April 5, 2024	1:00	58	68	56	48
Friday, April 5, 2024	2:00	57	69	55	49
Friday, April 5, 2024	3:00	59	67	57	51
Friday, April 5, 2024	4:00	62	68	61	56
Friday, April 5, 2024	5:00	63	70	63	60
Friday, April 5, 2024	6:00	64	70	63	60
Friday, April 5, 2024	7:00	63	71	63	60
Friday, April 5, 2024	8:00	62	77	61	59
Friday, April 5, 2024	9:00	62	69	62	59
Friday, April 5, 2024	10:00	60	68	59	56
Friday, April 5, 2024	11:00	59	73	59	56
Friday, April 5, 2024	12:00	57	67	57	53
Friday, April 5, 2024	13:00	57	70	56	53
Friday, April 5, 2024	14:00	62	72	62	54
Friday, April 5, 2024	15:00	66	83	65	61
Friday, April 5, 2024	16:00	65	71	65	62
Friday, April 5, 2024	17:00	67	76	67	64
Friday, April 5, 2024	18:00	63	71	62	59
Friday, April 5, 2024	19:00	65	71	65	61
Friday, April 5, 2024	20:00	61	73	61	58
Friday, April 5, 2024	21:00	60	67	60	57
Friday, April 5, 2024	22:00	59	66	58	55
Friday, April 5, 2024	23:00	58	72	58	53

Statistics	Leq	Lmax	L50	L90
Day Average	63	72	61	58
Night Average	61	69	59	54
Day Low	57	67	56	53
Day High	67	83	67	64
Night Low	57	66	55	48
Night High	64	72	63	60
Ldn	67	Day %		76
CNEL	68	Night %		24

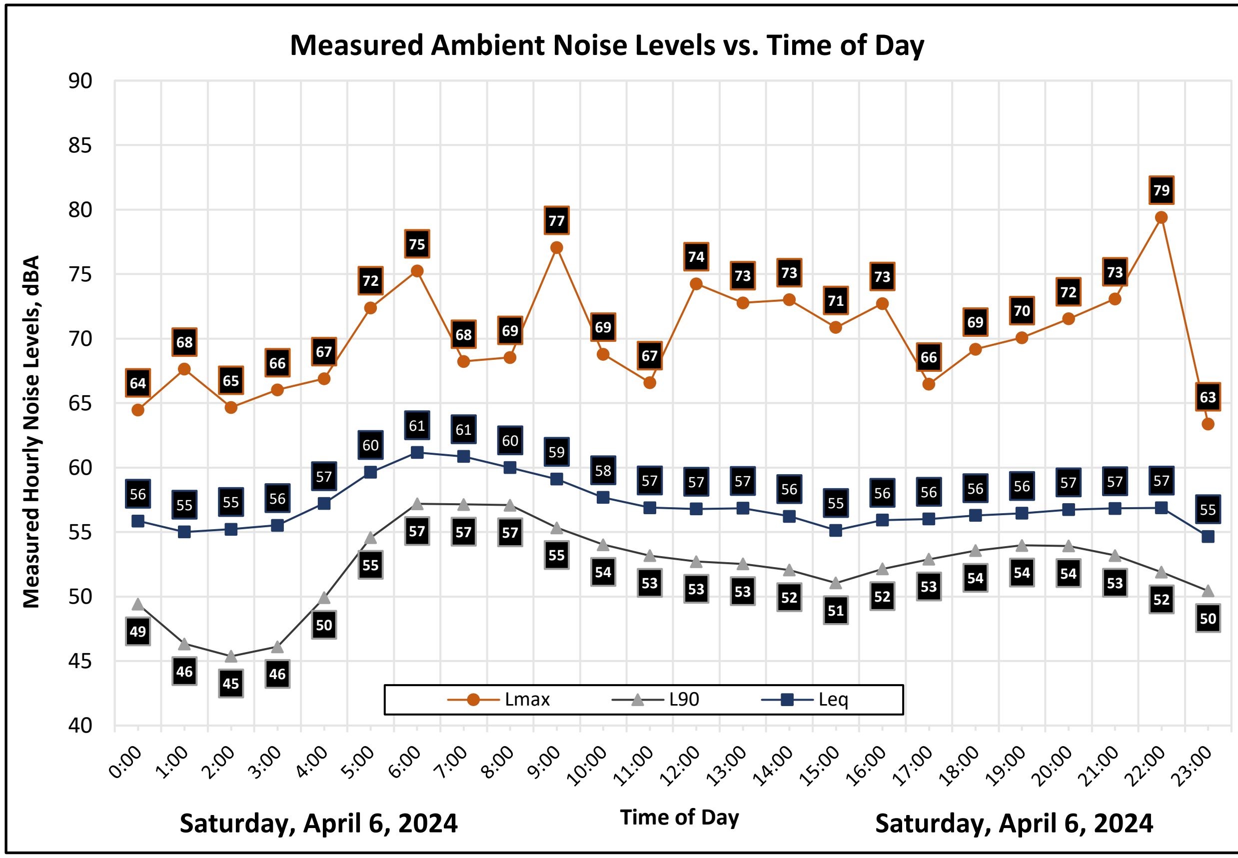


Appendix B3b: Continuous Noise Monitoring Results

Site: LT-4
Project: Scotts Valley Development Project
Location: South of Project Site
Coordinates: 10S 568410 4221990
Meter: LDL 820-8
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Saturday, April 6, 2024	0:00	56	64	55	49
Saturday, April 6, 2024	1:00	55	68	53	46
Saturday, April 6, 2024	2:00	55	65	53	45
Saturday, April 6, 2024	3:00	56	66	54	46
Saturday, April 6, 2024	4:00	57	67	56	50
Saturday, April 6, 2024	5:00	60	72	59	55
Saturday, April 6, 2024	6:00	61	75	61	57
Saturday, April 6, 2024	7:00	61	68	60	57
Saturday, April 6, 2024	8:00	60	69	60	57
Saturday, April 6, 2024	9:00	59	77	58	55
Saturday, April 6, 2024	10:00	58	69	57	54
Saturday, April 6, 2024	11:00	57	67	56	53
Saturday, April 6, 2024	12:00	57	74	56	53
Saturday, April 6, 2024	13:00	57	73	56	53
Saturday, April 6, 2024	14:00	56	73	55	52
Saturday, April 6, 2024	15:00	55	71	54	51
Saturday, April 6, 2024	16:00	56	73	55	52
Saturday, April 6, 2024	17:00	56	66	55	53
Saturday, April 6, 2024	18:00	56	69	56	54
Saturday, April 6, 2024	19:00	56	70	56	54
Saturday, April 6, 2024	20:00	57	72	56	54
Saturday, April 6, 2024	21:00	57	73	56	53
Saturday, April 6, 2024	22:00	57	79	55	52
Saturday, April 6, 2024	23:00	55	63	54	50

Statistics	Leq	Lmax	L50	L90
Day Average	57	71	56	54
Night Average	57	69	55	50
Day Low	55	66	54	51
Day High	61	77	60	57
Night Low	55	63	53	45
Night High	61	79	61	57
Ldn	63	Day %		65
CNEL	64	Night %		35

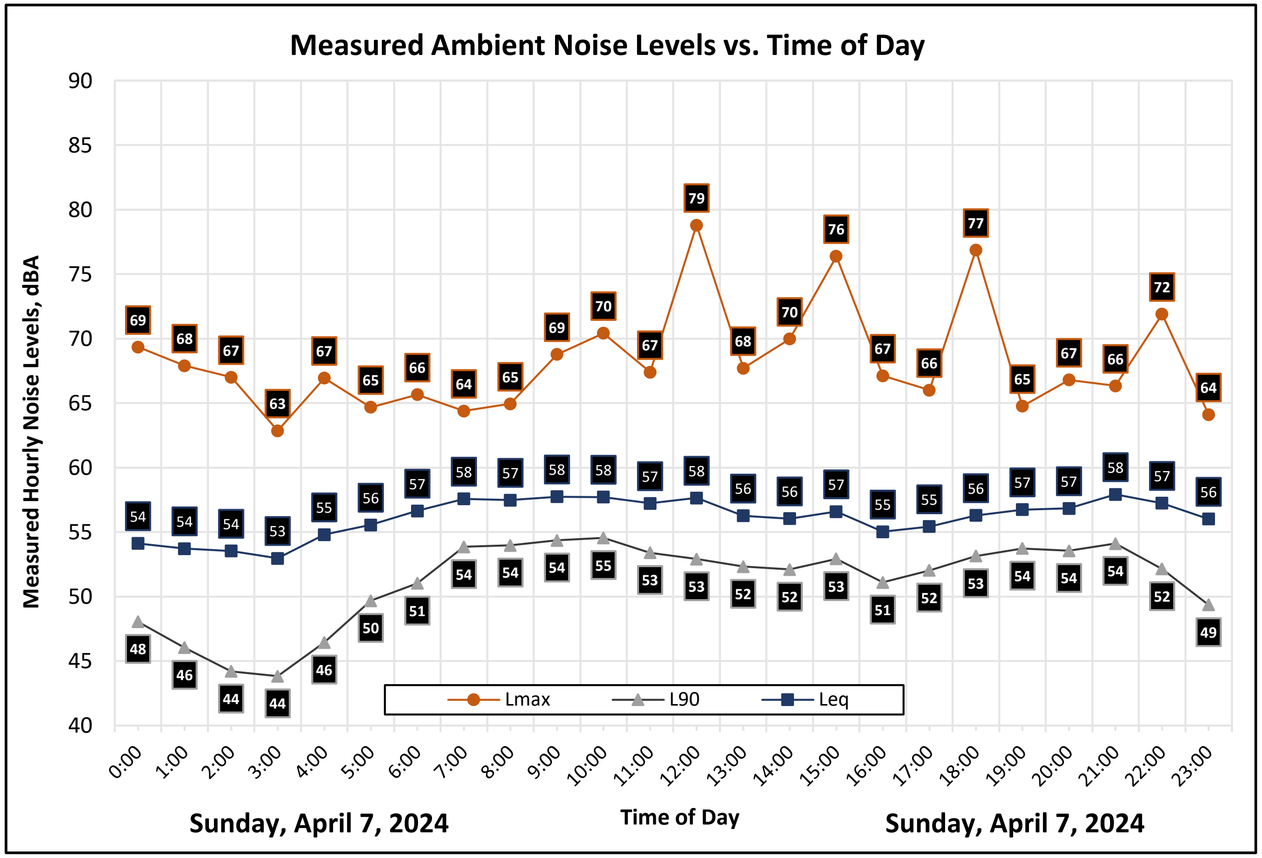


Appendix B3c: Continuous Noise Monitoring Results

Site: LT-4
Project: Scotts Valley Development Project
Location: South of Project Site
Coordinates: 10S 568410 4221990
Meter: LDL 820-8
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Sunday, April 7, 2024	0:00	54	69	53	48
Sunday, April 7, 2024	1:00	54	68	52	46
Sunday, April 7, 2024	2:00	54	67	51	44
Sunday, April 7, 2024	3:00	53	63	51	44
Sunday, April 7, 2024	4:00	55	67	53	46
Sunday, April 7, 2024	5:00	56	65	55	50
Sunday, April 7, 2024	6:00	57	66	56	51
Sunday, April 7, 2024	7:00	58	64	57	54
Sunday, April 7, 2024	8:00	57	65	57	54
Sunday, April 7, 2024	9:00	58	69	57	54
Sunday, April 7, 2024	10:00	58	70	57	55
Sunday, April 7, 2024	11:00	57	67	56	53
Sunday, April 7, 2024	12:00	58	79	56	53
Sunday, April 7, 2024	13:00	56	68	55	52
Sunday, April 7, 2024	14:00	56	70	55	52
Sunday, April 7, 2024	15:00	57	76	56	53
Sunday, April 7, 2024	16:00	55	67	54	51
Sunday, April 7, 2024	17:00	55	66	55	52
Sunday, April 7, 2024	18:00	56	77	55	53
Sunday, April 7, 2024	19:00	57	65	56	54
Sunday, April 7, 2024	20:00	57	67	56	54
Sunday, April 7, 2024	21:00	58	66	57	54
Sunday, April 7, 2024	22:00	57	72	56	52
Sunday, April 7, 2024	23:00	56	64	55	49

Statistics	Leq	Lmax	L50	L90
Day Average	57	69	56	53
Night Average	55	67	54	48
Day Low	55	64	54	51
Day High	58	79	57	55
Night Low	53	63	51	44
Night High	57	72	56	52
Ldn	61	Day %		75
CNEL	62	Night %		25



Appendix C: Traffic Noise Calculation Inputs and Results

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240210 Scotts Valley Development Project
Description: Existing Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Auto Mall Parkway	East of Project Access	15,520	83	0	17	1.0%	1.0%	45	670	-5	208	96	45	47.4
2	Auto Mall Parkway	West of Project Access	31,290	83	0	17	1.0%	1.0%	45	900	0	331	154	71	53.5
3	N Ascot Parkway	South of Auto Mall Parkway	4,130	83	0	17	1.0%	1.0%	35	70	-5	57	27	12	53.7
4	Auto Mall Parkway	South of Auto Mall Parkway	12,390	83	0	17	1.0%	1.0%	45	870	-5	179	83	38	44.7
5	Columbus Parkway	East of Ascot Court	11,720	83	0	17	1.0%	1.0%	45	150	-5	172	80	37	55.9
6	Columbus Parkway	West of Redwood Parkway	9,120	83	0	17	1.0%	1.0%	45	115	-5	146	68	31	56.5
7	Redwood Parkway	East of Redwood Parkway	3,740	83	0	17	1.0%	1.0%	35	90	-5	53	25	12	51.6
8	Admiral Callaghan Lan	South of Columbus Parkway	20,340	83	0	17	1.0%	1.0%	35	450	-5	165	77	36	48.5
9	Plaza Drive	West of Plaza Drive	10,400	83	0	17	1.0%	1.0%	35	205	-5	106	49	23	50.7
10	Turner Parkway	South of Admiral Callaghan Lane	8,390	83	0	17	1.0%	1.0%	35	55	0	92	43	20	63.3
11	Admiral Callaghan Lan	East of Admiral Callaghan Lane	16,970	83	0	17	1.0%	1.0%	35	205	0	147	68	32	57.8
12	Turner Parkway	South of Turner Parkway	8,030	83	0	17	1.0%	1.0%	35	75	-5	89	41	19	56.1
13	Redwood Parkway	East of Plaza Drive	7,640	83	0	17	1.0%	1.0%	35	90	0	86	40	19	59.7
14	Oakwood Avenue	West of Ascot Parkway	6,180	83	0	17	1.0%	1.0%	30	90	0	63	29	14	57.7

SAXELBY ACOUSTICS
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Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240210 Scotts Valley Development Project
Description: Existing Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

												Contours (ft.) - No Offset			
Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	60 dBA	65 dBA	70 dBA	Level, dBA
1	Auto Mall Parkway	East of Project Access	16,740	83	0	17	1.0%	1.0%	45	670	-5	218	101	47	47.7
2	Auto Mall Parkway	West of Project Access	36,310	83	0	17	1.0%	1.0%	45	900	0	366	170	79	54.1
3	N Ascot Parkway	South of Auto Mall Parkway	4,370	83	0	17	1.0%	1.0%	35	70	-5	59	28	13	53.9
4	Auto Mall Parkway	South of Auto Mall Parkway	13,370	83	0	17	1.0%	1.0%	45	870	-5	188	87	40	45.0
5	Columbus Parkway	East of Ascot Court	7,810	83	0	17	1.0%	1.0%	45	150	-5	131	61	28	54.1
6	Columbus Parkway	West of Redwood Parkway	10,100	83	0	17	1.0%	1.0%	45	115	-5	156	72	34	57.0
7	Redwood Parkway	East of Redwood Parkway	3,370	83	0	17	1.0%	1.0%	35	90	-5	50	23	11	51.2
8	Admiral Callaghan Lan	South of Columbus Parkway	21,830	83	0	17	1.0%	1.0%	35	450	-5	173	80	37	48.8
9	Plaza Drive	West of Plaza Drive	10,700	83	0	17	1.0%	1.0%	35	205	-5	108	50	23	50.8
10	Turner Parkway	South of Admiral Callaghan Lane	8,600	83	0	17	1.0%	1.0%	35	55	0	93	43	20	63.4
11	Admiral Callaghan Lan	East of Admiral Callaghan Lane	18,360	83	0	17	1.0%	1.0%	35	205	0	154	72	33	58.2
12	Turner Parkway	South of Turner Parkway	8,120	83	0	17	1.0%	1.0%	35	75	-5	90	42	19	56.2
13	Redwood Parkway	East of Plaza Drive	7,860	83	0	17	1.0%	1.0%	35	90	0	88	41	19	59.8
14	Oakwood Avenue	West of Ascot Parkway	6,030	83	0	17	1.0%	1.0%	30	90	0	62	29	13	57.6

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Appendix C-1
FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240210 Scotts Valley Development Project
Description: Baseline Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Auto Mall Parkway	East of Project Access	18,520	83	0	17	1.0%	1.0%	45	670	-5	234	108	50	48.1
2	Auto Mall Parkway	West of Project Access	36,090	83	0	17	1.0%	1.0%	45	900	0	364	169	79	54.1
3	N Ascot Parkway	South of Auto Mall Parkway	4,510	83	0	17	1.0%	1.0%	35	70	-5	61	28	13	54.1
4	Auto Mall Parkway	South of Auto Mall Parkway	13,900	83	0	17	1.0%	1.0%	45	870	-5	193	90	42	45.2
5	Columbus Parkway	East of Ascot Court	13,200	83	0	17	1.0%	1.0%	45	150	-5	186	87	40	56.4
6	Columbus Parkway	West of Redwood Parkway	10,530	83	0	17	1.0%	1.0%	45	115	-5	160	74	35	57.2
7	Redwood Parkway	East of Redwood Parkway	3,850	83	0	17	1.0%	1.0%	35	90	-5	55	25	12	51.7
8	Admiral Callaghan Lan	South of Columbus Parkway	22,590	83	0	17	1.0%	1.0%	35	450	-5	177	82	38	48.9
9	Plaza Drive	West of Plaza Drive	10,800	83	0	17	1.0%	1.0%	35	205	-5	108	50	23	50.8
10	Turner Parkway	South of Admiral Callaghan Lane	8,900	83	0	17	1.0%	1.0%	35	55	0	95	44	21	63.6
11	Admiral Callaghan Lan	East of Admiral Callaghan Lane	19,120	83	0	17	1.0%	1.0%	35	205	0	159	74	34	58.3
12	Turner Parkway	South of Turner Parkway	8,430	83	0	17	1.0%	1.0%	35	75	-5	92	43	20	56.3
13	Redwood Parkway	East of Plaza Drive	8,120	83	0	17	1.0%	1.0%	35	90	0	90	42	19	60.0
14	Oakwood Avenue	West of Ascot Parkway	6,240	83	0	17	1.0%	1.0%	30	90	0	64	30	14	57.8

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Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240210 Scotts Valley Development Project
Description: Baseline Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Auto Mall Parkway	East of Project Access	19,740	83	0	17	1.0%	1.0%	45	670	-5	244	113	53	48.4
2	Auto Mall Parkway	West of Project Access	41,110	83	0	17	1.0%	1.0%	45	900	0	397	184	86	54.7
3	N Ascot Parkway	South of Auto Mall Parkway	4,750	83	0	17	1.0%	1.0%	35	70	-5	63	29	14	54.3
4	Auto Mall Parkway	South of Auto Mall Parkway	14,880	83	0	17	1.0%	1.0%	45	870	-5	202	94	43	45.5
5	Columbus Parkway	East of Ascot Court	14,180	83	0	17	1.0%	1.0%	45	150	-5	195	91	42	56.7
6	Columbus Parkway	West of Redwood Parkway	11,510	83	0	17	1.0%	1.0%	45	115	-5	170	79	37	57.6
7	Redwood Parkway	East of Redwood Parkway	3,850	83	0	17	1.0%	1.0%	35	90	-5	55	25	12	51.7
8	Admiral Callaghan Lan	South of Columbus Parkway	24,080	83	0	17	1.0%	1.0%	35	450	-5	185	86	40	49.2
9	Plaza Drive	West of Plaza Drive	11,100	83	0	17	1.0%	1.0%	35	205	-5	110	51	24	51.0
10	Turner Parkway	South of Admiral Callaghan Lane	9,110	83	0	17	1.0%	1.0%	35	55	0	97	45	21	63.7
11	Admiral Callaghan Lan	East of Admiral Callaghan Lane	20,510	83	0	17	1.0%	1.0%	35	205	0	166	77	36	58.6
12	Turner Parkway	South of Turner Parkway	8,520	83	0	17	1.0%	1.0%	35	75	-5	93	43	20	56.4
13	Redwood Parkway	East of Plaza Drive	8,340	83	0	17	1.0%	1.0%	35	90	0	91	42	20	60.1
14	Oakwood Avenue	West of Ascot Parkway	6,460	83	0	17	1.0%	1.0%	30	90	0	65	30	14	57.9

Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240210 Scotts Valley Development Project
Description: Cumulative Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Auto Mall Parkway	East of Project Access	21,550	83	0	17	1.0%	1.0%	45	670	-5	258	120	56	48.8
2	Auto Mall Parkway	West of Project Access	42,410	83	0	17	1.0%	1.0%	45	900	0	406	188	87	54.8
3	N Ascot Parkway	South of Auto Mall Parkway	5,340	83	0	17	1.0%	1.0%	35	70	-5	68	31	15	54.8
4	Auto Mall Parkway	South of Auto Mall Parkway	16,400	83	0	17	1.0%	1.0%	45	870	-5	215	100	46	45.9
5	Columbus Parkway	East of Ascot Court	15,560	83	0	17	1.0%	1.0%	45	150	-5	208	97	45	57.1
6	Columbus Parkway	West of Redwood Parkway	12,360	83	0	17	1.0%	1.0%	45	115	-5	178	83	38	57.9
7	Redwood Parkway	East of Redwood Parkway	4,600	83	0	17	1.0%	1.0%	35	90	-5	61	28	13	52.5
8	Admiral Callaghan Lan	South of Columbus Parkway	25,680	83	0	17	1.0%	1.0%	35	450	-5	193	90	42	49.5
9	Plaza Drive	West of Plaza Drive	10,800	83	0	17	1.0%	1.0%	35	205	-5	108	50	23	50.8
10	Turner Parkway	South of Admiral Callaghan Lane	10,590	83	0	17	1.0%	1.0%	35	55	0	107	50	23	64.3
11	Admiral Callaghan Lan	East of Admiral Callaghan Lane	22,550	83	0	17	1.0%	1.0%	35	205	0	177	82	38	59.0
12	Turner Parkway	South of Turner Parkway	10,060	83	0	17	1.0%	1.0%	35	75	-5	103	48	22	57.1
13	Redwood Parkway	East of Plaza Drive	9,670	83	0	17	1.0%	1.0%	35	90	0	101	47	22	60.7
14	Oakwood Avenue	West of Ascot Parkway	7,430	83	0	17	1.0%	1.0%	30	90	0	72	33	15	58.5

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Appendix C-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240210 Scotts Valley Development Project
Description: Cumulative Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Auto Mall Parkway	East of Project Access	20,540	83	0	17	1.0%	1.0%	45	670	-5	250	116	54	48.6
2	Auto Mall Parkway	West of Project Access	44,340	83	0	17	1.0%	1.0%	45	900	0	418	194	90	55.0
3	N Ascot Parkway	South of Auto Mall Parkway	5,580	83	0	17	1.0%	1.0%	35	70	-5	70	32	15	55.0
4	Auto Mall Parkway	South of Auto Mall Parkway	17,380	83	0	17	1.0%	1.0%	45	870	-5	224	104	48	46.2
5	Columbus Parkway	East of Ascot Court	16,540	83	0	17	1.0%	1.0%	45	150	-5	217	101	47	57.4
6	Columbus Parkway	West of Redwood Parkway	13,340	83	0	17	1.0%	1.0%	45	115	-5	188	87	40	58.2
7	Redwood Parkway	East of Redwood Parkway	4,600	83	0	17	1.0%	1.0%	35	90	-5	61	28	13	52.5
8	Admiral Callaghan Lan	South of Columbus Parkway	27,170	83	0	17	1.0%	1.0%	35	450	-5	201	93	43	49.7
9	Plaza Drive	West of Plaza Drive	11,100	83	0	17	1.0%	1.0%	35	205	-5	110	51	24	51.0
10	Turner Parkway	South of Admiral Callaghan Lane	10,800	83	0	17	1.0%	1.0%	35	55	0	108	50	23	64.4
11	Admiral Callaghan Lan	East of Admiral Callaghan Lane	23,940	83	0	17	1.0%	1.0%	35	205	0	184	86	40	59.3
12	Turner Parkway	South of Turner Parkway	10,150	83	0	17	1.0%	1.0%	35	75	-5	104	48	22	57.1
13	Redwood Parkway	East of Plaza Drive	9,890	83	0	17	1.0%	1.0%	35	90	0	102	47	22	60.8
14	Oakwood Avenue	West of Ascot Parkway	9,090	83	0	17	1.0%	1.0%	30	90	0	82	38	18	59.4

Appendix C-4
FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240210 Scotts Valley Development Project
Description: Cumulative (Scenario B) Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Auto Mall Parkway	East of Project Access	22,810	83	0	17	1.0%	1.0%	45	670	-5	268	125	58	49.0
2	Auto Mall Parkway	West of Project Access	47,240	83	0	17	1.0%	1.0%	45	900	0	436	202	94	55.3
3	N Ascot Parkway	South of Auto Mall Parkway	5,570	83	0	17	1.0%	1.0%	35	70	-5	70	32	15	55.0
4	Auto Mall Parkway	South of Auto Mall Parkway	17,330	83	0	17	1.0%	1.0%	45	870	-5	223	104	48	46.1
5	Columbus Parkway	East of Ascot Court	16,490	83	0	17	1.0%	1.0%	45	150	-5	216	100	47	57.4
6	Columbus Parkway	West of Redwood Parkway	13,290	83	0	17	1.0%	1.0%	45	115	-5	187	87	40	58.2
7	Redwood Parkway	East of Redwood Parkway	4,600	83	0	17	1.0%	1.0%	35	90	-5	61	28	13	52.5
8	Admiral Callaghan Lan	South of Columbus Parkway	27,090	83	0	17	1.0%	1.0%	35	450	-5	200	93	43	49.7
9	Plaza Drive	West of Plaza Drive	11,090	83	0	17	1.0%	1.0%	35	205	-5	110	51	24	51.0
10	Turner Parkway	South of Admiral Callaghan Lane	10,800	83	0	17	1.0%	1.0%	35	55	0	108	50	23	64.4
11	Admiral Callaghan Lan	East of Admiral Callaghan Lane	23,890	83	0	17	1.0%	1.0%	35	205	0	184	85	40	59.3
12	Turner Parkway	South of Turner Parkway	10,140	83	0	17	1.0%	1.0%	35	75	-5	104	48	22	57.1
13	Redwood Parkway	East of Plaza Drive	9,870	83	0	17	1.0%	1.0%	35	90	0	102	47	22	60.8
14	Oakwood Avenue	West of Ascot Parkway	7,630	83	0	17	1.0%	1.0%	30	90	0	73	34	16	58.6

Appendix C-4
FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240210 Scotts Valley Development Project
Description: Cumulative (Scenario C) Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

												Contours (ft.) - No Offset			
Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	60 dBA	65 dBA	70 dBA	Level, dBA
1	Auto Mall Parkway	East of Project Access	22,370	83	0	17	1.0%	1.0%	45	670	-5	265	123	57	49.0
2	Auto Mall Parkway	West of Project Access	45,370	83	0	17	1.0%	1.0%	45	900	0	424	197	91	55.1
3	N Ascot Parkway	South of Auto Mall Parkway	5,480	83	0	17	1.0%	1.0%	35	70	-5	69	32	15	54.9
4	Auto Mall Parkway	South of Auto Mall Parkway	16,980	83	0	17	1.0%	1.0%	45	870	-5	220	102	47	46.1
5	Columbus Parkway	East of Ascot Court	16,140	83	0	17	1.0%	1.0%	45	150	-5	213	99	46	57.3
6	Columbus Parkway	West of Redwood Parkway	12,940	83	0	17	1.0%	1.0%	45	115	-5	184	85	40	58.1
7	Redwood Parkway	East of Redwood Parkway	4,600	83	0	17	1.0%	1.0%	35	90	-5	61	28	13	52.5
8	Admiral Callaghan Lan	South of Columbus Parkway	26,550	83	0	17	1.0%	1.0%	35	450	-5	197	92	43	49.6
9	Plaza Drive	West of Plaza Drive	10,960	83	0	17	1.0%	1.0%	35	205	-5	109	51	24	50.9
10	Turner Parkway	South of Admiral Callaghan Lane	10,710	83	0	17	1.0%	1.0%	35	55	0	108	50	23	64.4
11	Admiral Callaghan Lan	East of Admiral Callaghan Lane	23,680	83	0	17	1.0%	1.0%	35	205	0	183	85	39	59.3
12	Turner Parkway	South of Turner Parkway	10,100	83	0	17	1.0%	1.0%	35	75	-5	104	48	22	57.1
13	Redwood Parkway	East of Plaza Drive	9,790	83	0	17	1.0%	1.0%	35	90	0	102	47	22	60.8
14	Oakwood Avenue	West of Ascot Parkway	7,550	83	0	17	1.0%	1.0%	30	90	0	72	34	16	58.6

Appendix M-1

Phase 1 ESA

PHASE I
ENVIRONMENTAL SITE ASSESSMENT

SCOTTS VALLEY BAND OF POMO INDIANS
FEE-TO-TRUST PROJECT

SOLANO COUNTY, CA

MAY 2023

PREPARED FOR:

Scotts Valley Band of Pomo Indians
1005 Parallel Drive
Lakeport, CA, 95453

PREPARED BY:

AES-Montrose
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479
www.analyticalcorp.com

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EXECUTIVE SUMMARY

PHASE I ENVIRONMENTAL SITE ASSESSMENT
SCOTTS VALLEY VALLEJO FEE-TO-TRUST PROJECT

The Subject Property consists of a single 129-acre parcel of land (Subject Property) located northeast of the intersection of Interstate 80 (I-80) and Columbus Parkway in the City of Vallejo, Solano County, CA (Project Site). This Phase I ESA has been prepared on behalf of the Scotts Valley Band of Pomo Indians (Tribe) and in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Standard Practice E 1527-21 and Bureau of Indian Affairs (BIA) Guidelines (602 DM Chapter 2). Any exceptions to or deletions from this practice are described in **Section 1.0**. After the Subject Property is taken into federal trust, the Tribe proposes to develop and operate a gaming facility.

The Phase I ESA includes database searches, a field survey, and interviews and was prepared to identify Recognized Environmental Conditions (RECs) that may affect future uses of the Subject Property.

Current Use of Subject Property

The Subject Property is currently vacant.

Site Features of Concern

There are the remnants of small-scale open-pit serpentine mining on the Subject Property. Serpentine is a source of naturally occurring asbestos (NOA), and outcrops occur naturally throughout the parcel; the mines either exhausted individual veins or have been covered by eroding soil, tailings piles are covered with soil, and so they do not offer any remaining serpentine exposures; the natural outcrops are the locations of weathered serpentine on the ground surface. Asbestos is commonly found in ultramafic rock, including serpentine, near fault zones and is released into the air when it is broken or crushed. This can happen when land is graded for building purposes, or at quarrying operations. The state of California has determined that NOA, such as serpentine rock, is a toxic air contaminant and if inhaled may result in the development of lung cancer or cause other health hazards. Work in serpentine areas requires a District pre-approved dust control plan and may include asbestos air monitoring. Additionally, the mine tailings on the Subject Property may contain toxic substances other than asbestos; the presence of a mercury mine less than a mile to the east (DWR, 2023) suggests the potential for other toxic substances.

There are pieces of milled lumber and piping that would have been associated with processing mined ore, but all structural elements have collapsed and are scattered, except for a spring box located upslope from the mine complex.

The only other finds consist of two high-voltage power lines with towers, each crossing the Subject Property in an approximately north to south direction, a monitoring well, water main covers, and a very large soil stockpile at the southern end of the Subject Property.

Limiting Conditions and Data Gaps

The Subject Property is unmapped in the Sanborn Library; thus, no records were available for review.

Activity and Use Limitations

A review of "activity and use limitations" was not within the scope of this ESA but may be obtained through a title search.

Findings

This ESA was performed in conformance with the scope and limitations of ASTM Standard Practice E 1527-21 and the BIA Guidelines (602 DM Chapter 2). Any exceptions to, or deletions from, this practice are described in **Section 1.0** of this report. Based on information gathered while conducting this ESA, no RECs, Historic RECs, or Controlled RECs were identified in connection with the Subject Property.

Recommendations

Based on the findings and conclusions of this Phase I ESA, the following recommendations are made:

- If ground-disturbing activities occur on the Subject Property, follow a district-approved dust control plan.
- Is recommended that the mine tailings piles on site be tested to ensure that no toxic substances are contained therein which might be a REC for the Subject Property.
- Track down monitoring well results as part of project planning.

TABLE OF CONTENTS

PHASE I ENVIRONMENTAL SITE ASSESSMENT
SCOTTS VALLEY BAND OF POMO INDIANS, VALLEJO FEE-TO-TRUST PROJECT

FIGURES

TABLES

APPENDICES

SECTION 1.0
INTRODUCTION

1.1 PURPOSE

This Phase I Environmental Site Assessment (ESA) was prepared to identify Recognized Environmental Conditions (RECs) that may affect future uses of the Subject Property. The Phase I ESA includes a database search, a field survey, and interviews. The term REC refers to the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with relevant laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Additionally, the term Historical Recognized Environmental Conditions (HREC) refers to environmental conditions associated with the Subject Property, including a past release of any hazardous substance or petroleum product that has since been remediated, which would have been considered a REC in the past. This ESA also includes the analysis of the presence of Controlled Recognized Environmental Conditions (CREC) for hazardous substance releases that have been partially addressed through remediation, but where some contamination remains in place under certain risk-based restrictions or conditions. An analysis of HRECs and CRECs are included in this ESA (American Society for Testing and Materials [ASTM], 2021).

1.2 SCOPE OF SERVICES

This Phase I ESA was completed in conformance with the Bureau of Indian Affairs (BIA) Guidelines (602 DM Chapter 2) and the ASTM Standard Practice E 1527-21. The Phase I ESA includes the approximately 101-acre Subject Property and surrounding known sources of contamination up to a 1.0-mile radius from the Subject Property. The scope of work performed includes:

1. Review of previously prepared ESAs,
2. Review of relevant database listings of hazardous material sites, waste generators, and underground storage tanks (UST),
3. Review of historical topographic maps and aerial photographs of the Subject Property,
4. Interviews with owners, operators, occupants, and/or local government officials.
5. Site reconnaissance of the Subject Property.

Physical testing of soil or groundwater is not within the scope of this Phase I ESA. Neither testing for asbestos-containing building materials nor lead-based paint surveys are included as part of this assessment. Per- and Polyfluoroalkyl Substances (PFAS) are not considered as part of this assessment.

1.3 LIMITATIONS AND EXCEPTIONS

No Phase I ESA can completely eliminate uncertainty regarding the potential for RECs in connection with a property. Conformance of this assessment to ASTM Standard Practice E 1527-21 will reduce, but not eliminate uncertainty regarding the potential for RECs in connection with the Subject Property.

While every effort has been made to discover and interpret available historical and current information on the Subject Property within the time available, the possibility of undiscovered contamination remains. This report is a best effort collection and interpretation of available information consistent with industry standards for the completion of Phase I ESAs.

1.4 METHODOLOGY

The following data sources were included in this Phase I ESA:

Historical Records

- Previous land uses and the history of the Subject Property were researched in an effort to identify RECs, HRECs, and CRECs at or near the Subject Property.
- Historical aerial photographs (**Appendix A**) and historic topographic maps (**Appendix B**) from different decades were examined for the presence of aboveground storage tanks (AST), industrial buildings, gas station canopies and/or pump islands, as well as other indications of bulk hazardous material storage within the study area.
- Sanborn Fire Insurance Maps document historical property use through abbreviations and map symbols that identify commercial, residential, industrial, residential, and other land uses; because of the rural location, the Subject Property is not included on Sanborn maps (**Appendix C**).
- The City Directory Image Report may also indicate previous land uses of the Subject Property (**Appendix D**).
- The Department of Toxic Substances Control Envirostor website.
- The California Department of Water Resources GeoTracker website.

Database Searches

A database search was conducted utilizing the online search company that provides a Radius Map Report of the results of an Environmental Database Report (EDR). The Radius Map Report (**Appendix E**) provides graphical and tabulated results of the EDR search that includes records of known storage tank sites and known sites of hazardous materials generation, storage, and/or release compiled by federal, state, and local agencies. These compiled records consist of: (a) known or potential hazardous waste sites and landfills; (b) sites currently under investigation for environmental violations; (c) sites that manufacture, generate, use, store, and/or dispose of hazardous materials or hazardous wastes; (d) sites that have USTs and/or ASTs; and (e) sites with recorded violations of regulations concerning USTs and hazardous materials/hazardous wastes. The database search is intended to identify facilities that may have the potential to impact surface and subsurface conditions on the Subject Property.

Site Reconnaissance

A site reconnaissance inspection was conducted on September 9, 2022, to visually examine the Subject Property for obvious physical indications of improper hazardous substance or petrochemical disposal, such as stained soil or asphalt, stressed vegetation, sumps, partially buried drums, bulk USTs and ASTs for fuel, and other obvious signs of hazardous materials involvement.

Questionnaires

A questionnaire was completed by Casey Spanish, property owner and Solano County.

1.5 DEVIATIONS AND DATA GAPS

ASTM Standard E 1527-21 requires any significant data gaps, deviations, and deletions from the ASTM Standard to be identified and addressed in the Phase I ESA.

A significant data gap would be one that affected the ability to identify a REC on the Subject Property or adjacent properties.

Due to the location of the Subject Property, Sanborn Fire Insurance Maps were not available (**Appendix C**). However, historical aerial photographs (**Appendix A**) and historic topographic maps (**Appendix B**) were available for review of past uses of the Subject Property. Therefore, the lack of Sanborn Fire Insurance Maps is not considered a significant data gap for this Phase I ESA. The EDR radius map and site reconnaissance were completed over six months ago, however since the site is undeveloped these are not significant data gaps.

SECTION 2.0

SITE DESCRIPTION AND RECONNAISSANCE

2.1 LOCATION AND LEGAL DESCRIPTION

The Subject Property is located northeast of the intersection of Interstate 80 (I-80) and Columbus Parkway in the City of Vallejo, Solano County, CA (**Figures 1, 2,** and **3**) and is further identified as Assessor's Parcel Number 0182-010-010. The site is in Township 4 North, Range 3 West, Sections 5 and 32, as depicted on the Cordelia, CA United States Geological Survey (USGS) quadrangle.

2.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The Subject Property is immediately adjacent to I-80, and the Six Flags Discovery Kingdom amusement park and the Gateway Plaza commercial center are nearby. Regional access to the property is provided by I-80 to the west and Columbus Parkway to the south. The remainder of the Subject Property is surrounded by undeveloped land.

2.3 CURRENT USES OF THE SUBJECT PROPERTY

The Subject Property is primarily undeveloped vacant land.

2.4 CURRENT USES OF ADJOINING PROPERTIES

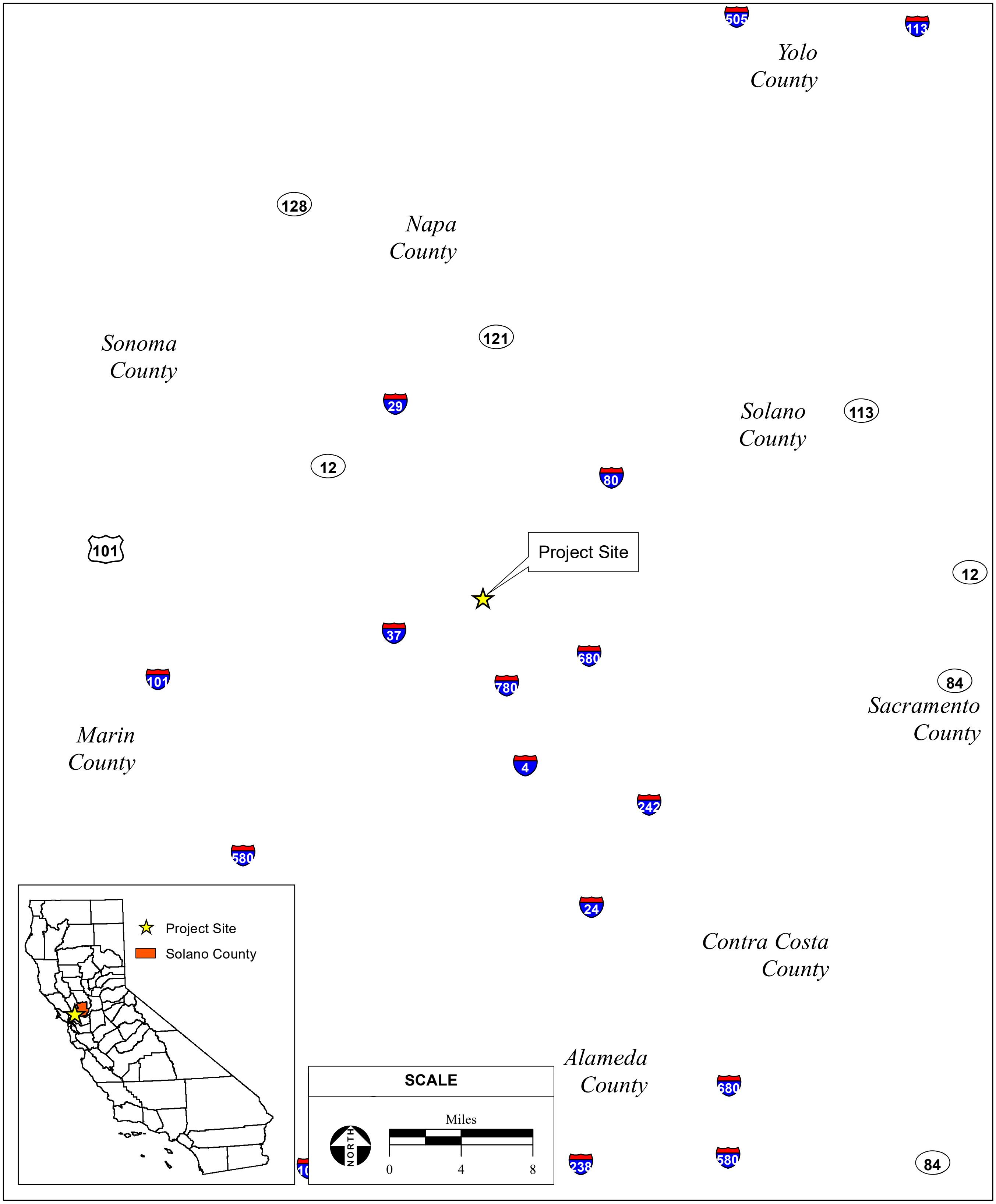
The current adjoining property uses are:

North: Vacant land with minimal rural residential development
South: Columbus Parkway, Gateway Plaza, and residential development
East: Vacant land with minimal rural residential development
West: I-80, Six Flags, residential development

2.5 HISTORIC USES OF THE SUBJECT PROPERTY

Aerial Photographs

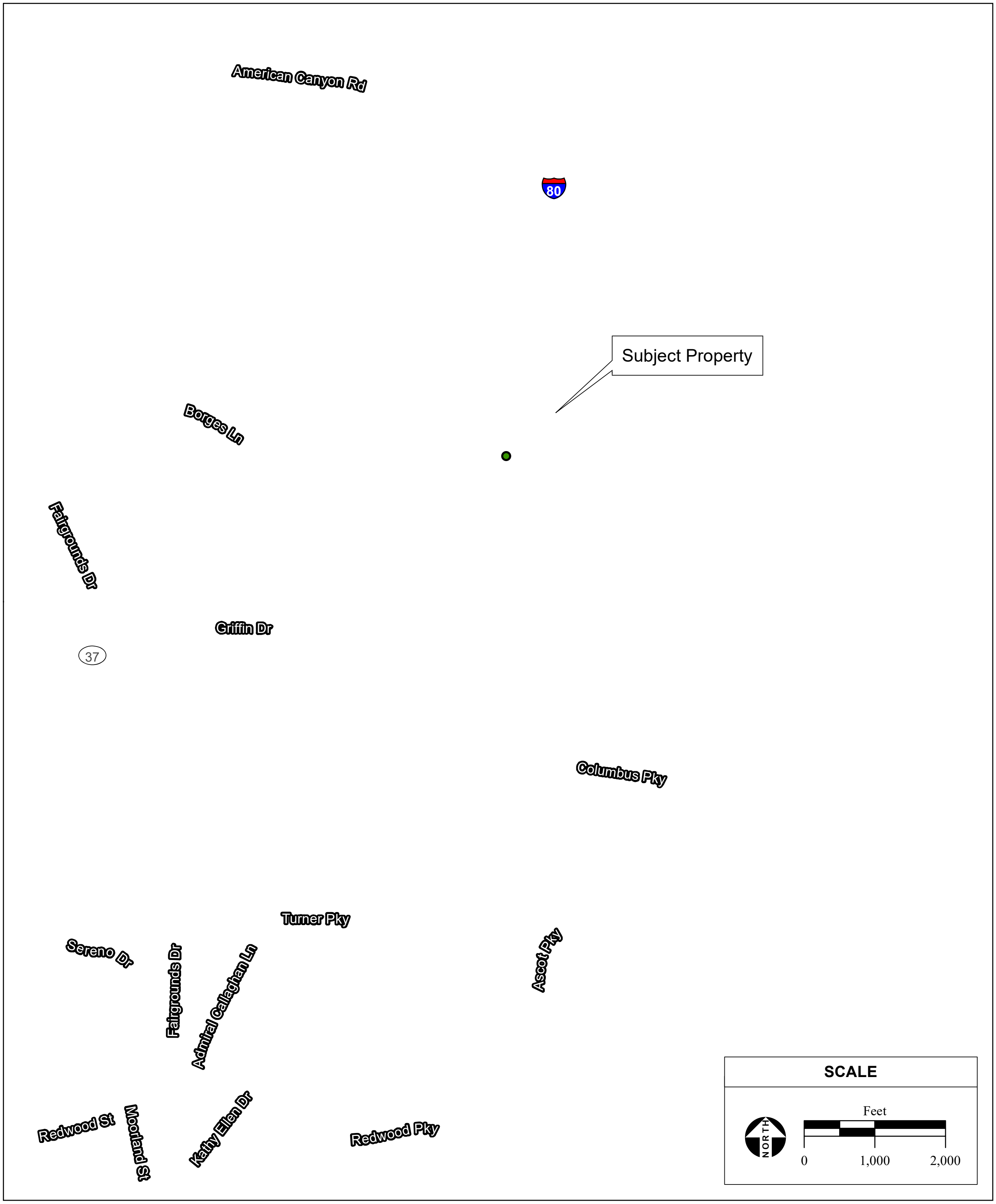
Historic aerial photographs (**Appendix A**) were reviewed for information regarding past uses of the Subject Property and surrounding areas. Aerial photographs from 1937, 1947, 1952, 1958, 1963, 1968, 1974, 1982, 1993, 2006, 2009, 2012, and 2016 were reviewed; all photographs were at a 1" = 875' scale and had varying clarity.



SOURCE: ESRI, 2022; AES-Montrose, 9/19/2022

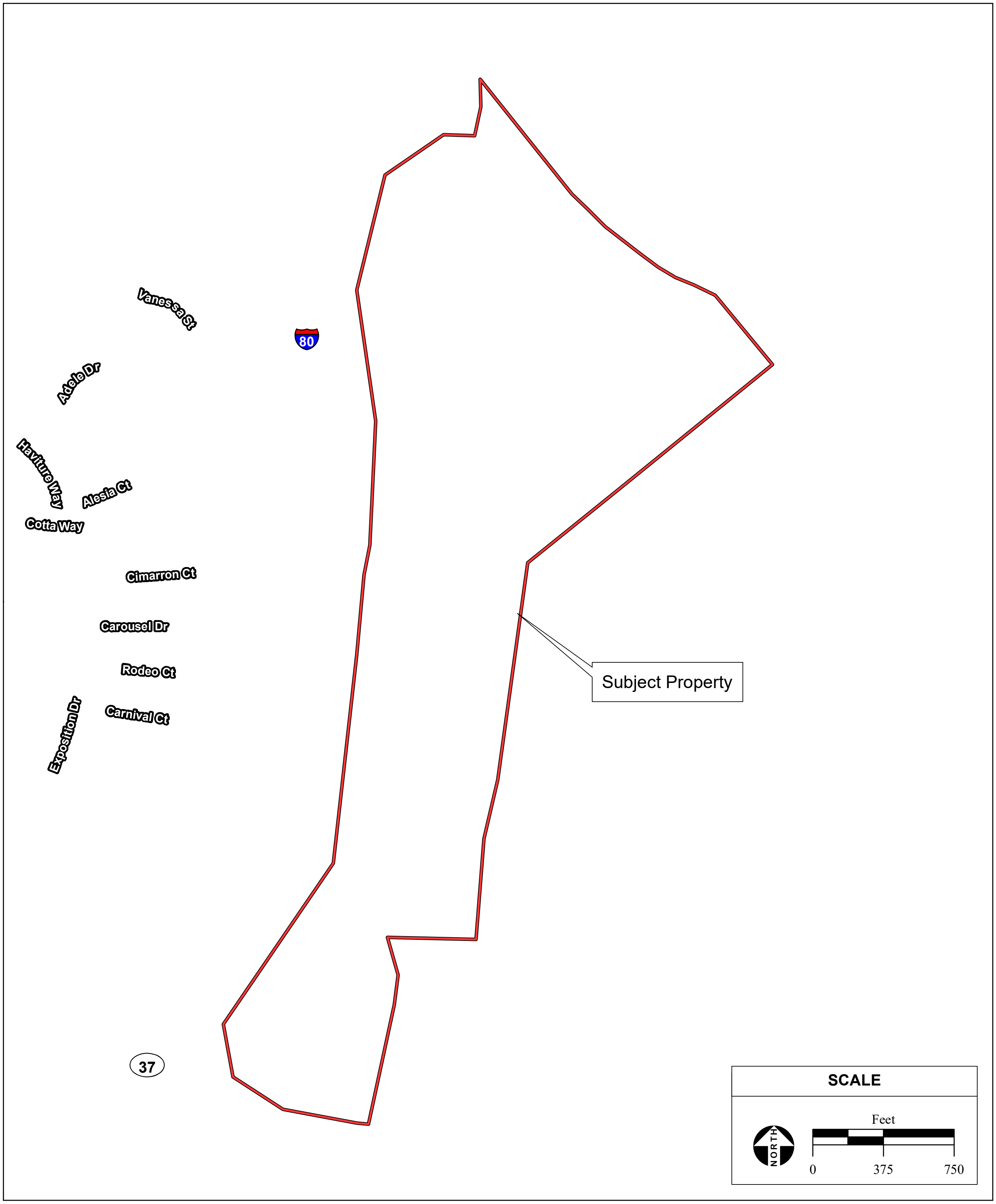
Scotts Valley Fee-to-Trust Phase I ESA / 222535

Figure 1
Regional Location



SOURCE:"Cordelia, CA" USGS 7.5 Minute Topographic Quadrangle,
T3N R3W, T4N R3W, Sections 5, 32, & 33, Mt. Diablo Baseline & Meridian;
ESRI, 2022; AES-Montrose, 9/19/2022

Figure 2
Site and Vicinity



SOURCE: Solano County Parcels, 2022; Vivid Advanced Maxar aerial photograph, 4/8/2021, 6/2/2021; ESRI, 2022; AES-Montrose, 9/19/2022

Figure 3
Aerial Photograph

Historical aerial images offer detailed review of previous land uses on the Subject Property and adjacent properties. In the earliest photograph, 1937, I-80 and Columbus Parkway are visible; an agricultural area and residence are visible adjacent to the southeastern corner of the Subject Property, and either a drainage or possible road appears with four trees spaced alongside, barely within the Subject Property boundaries. There is also a possible small agricultural area in the northwestern corner, however the rest is vacant with dirt roads and drainages. In 1947, there is a possible mining/quarry area located in the approximate center of the Subject Property. In 1958, there is evidence of mowing, particularly at the southern end of the Subject Property and no indications of active mining or quarrying.

No activity is visible beginning in 1963, although the beginnings of residential development appear to the west, a line of electrical transmission towers appears near the western edge of the Subject Property by 1968, and a water tank appears to the east of the Subject Property in the 1993 photo. The commercial development south of the Subject Property is also beginning in 1993.

Historic Topographic maps

Available historic USGS topographic quadrangles (**Appendix B**) were reviewed for information regarding past uses of the Subject Property. These include: 15' Carquinez Strait (1896, 1901, 1940), 15' Karquines (1898, 1901), 30' Napa (1902), 15' Port Chicago (1947), 7.5' Benicia (1950, 1951, 1968, 1980, 2012, 2015, 2018), and 7.5' Benicia (1950, 1951, 1968, 1980, 2012, 2015, 2018).

The beginnings of I-80 and Columbus Parkway are visible from the earliest (1896) map, as is the residence which is likely to be the one located southeast of the Subject Property. A north-south running transmission line crosses the full length of the Subject Property by 1940, and a residence and access road appear near the northeastern corner but disappear by 1950. A second transmission line, following the western edge of the Subject Property, appears in 1950. No other structures appear to be present on the Subject Property.

Sanborn Fire Insurance Maps

The Subject Property is unmapped by Sanborn Fire Insurance Maps (**Appendix C**).

The City Directory Image Report

The City Directory may also indicate previous land uses of the cross street of the Subject Property (**Appendix D**). Images are unavailable prior to 1965. The Subject Property is not listed.

2.6 PHYSICAL FEATURES

Hydrology and Geology

The Subject Property slopes steeply upward to the north, with the only semi-level areas near the southern end. Surface waters in the Subject Property drain to the south and southwest. The rock stratigraphic unit of the Subject Property is of the Mesozoic era, Cretaceous system, and Lower Cretaceous series (Appendix E). The dominant soils on the Subject Property are Toomes very stony loam, Dibble clay loam, and Clear Lake clay. The loams are both well-drained, while the clay is poorly drained. Toomes very stony loam and Clear Lake clay both have very slow infiltration rates, and Dibble clay loam has a slow infiltration rate (**Appendix E**). The Subject Property is located in a very seismically active region; the nearest fault is the Holocene-era Green Valley Fault (DOC, 2015).

The Subject Property exhibits an elevation increase from approximately 150 above mean sea level (amsl) in the southern portion of the Subject Parcel to 550 feet amsl in the northern portion of the Subject Parcel. The nearest natural water sources consist of several ephemeral drainages crossing the Subject Parcel.

Floodplain Map

The Federal Emergency Management Agency (FEMA) designates flood risk areas based on a parcel's location with respect to 100-year and 500-year floodplains. A 100-year flood is the flood elevation that has a 1 percent chance of being equaled or exceeded each year and a 500-year flood is the flood elevation that has a 0.2 percent chance of being equaled or exceeded each year. FEMA prepares Flood Insurance Rate Maps (FIRM) that show the flood risk designations of lands throughout the United States. The Subject Property is located in Flood Zone X, which is an area of minimal flood hazard. Zone X is identified by FEMA as those areas located outside the Special Flood Hazard Area and above the elevation of a 0.2-percent-annual-chance flood (FEMA, 2022). A copy of the regional floodplain map is included in **Appendix F**.

Wetlands Map

A series of ephemeral drainages have been mapped on the Subject Property (USFWS, 2022, **Appendix G**).

Roadways

The Subject Property is undeveloped, with internal dirt roadways. Regional access to the property is provided by I-80 to the west, and local access is provided by Columbus Parkway to the south.

2.7 SITE RECONNAISSANCE OBSERVATIONS

The objective of the site reconnaissance was to identify current or historic hazardous materials involvement or signature environmental conditions on the Subject Property to substantiate or build upon research demonstrating past uses of the Subject Property. Hazardous materials involvement or signature environmental conditions include the presence or likely presence of any hazardous materials or petroleum products that indicate an existing release, past release, or a threat of release into structures, soil, or groundwater on the Subject Property. Signs of hazardous materials could include ASTs or USTs; on-site wastewater treatment systems; monitoring wells; stained soils and/or unusual odors; indications of any excavation or removal of soils; patched asphalt; large debris piles; or other obvious signs of hazardous materials involvement.

The site reconnaissance was performed by Charlane Gross on September 9, 2022. No evidence of stained soils, odors, or past hazardous releases was observed within the Subject Property. The only evidence of use included the transmission lines on the eastern and western portions of the Subject Property, a small exploratory mine tunnel, a second possible mine tunnel, an open pit steatite mine, mine tailings, and a sparse debris scatter related to mining activities that included lumber and metal piping.

Buildings/Structures

There are no buildings or structures on the Subject Property.

Undocumented fill

No undocumented fill was observed on the Subject Property; the soil mounds are clearly tailings from the mining efforts. However, possible other sources of contamination in any of the tailings is unknown.

Agricultural uses

There is no evidence that the Subject Property has been used for agriculture. Site observations are summarized in **Table 1**.

TABLE 1: SUMMARY OF SITE OBSERVATIONS

Site Setting	Observations
Current Uses of Property	The Subject Property is currently vacant, and is only used for grazing.
Past Uses of Property	The Subject Property has been used for serpentine mining, as a soil stockpile location, and for grazing.
Current Uses of Adjoining Property	North: Vacant and minimal rural residential
	South: Columbus Parkway, Gateway Plaza, and residential development
	East: Vacant land with minimal rural residential development
	West: I-80, Six Flags Amusement Park, residential development
Current or Past Uses in the Surrounding Area	The area has been historically used for agriculture, residential, or vacant.
Geologic, Hydrogeologic, Hydrologic, and Topographic Conditions	The Subject Property is steeply sloped upwards towards the north and east. There are natural serpentine exposures running in veins, with weathered rock faces to the west. Two primary drainages cross the Subject Property.
General Description of Structures	There are no structures.
Undocumented Fill	There is a very large soil stockpile at the southern end of the Subject Property.
Roads	Regional access to the property is provided by Interstate 80 to the west and Columbus Parkway to the south. There is an internal network of dirt roads.
Potable Water Supply	There are water meter covers, and it is presumed that water lines run along at least part of the western edge of the Subject Property.
Sewage Disposal System	There is currently no sewage disposal system on the Subject Property.
Waste Removal Services	There is currently no waste removal service at the Subject Property.
Possible Hazardous Substances and Petroleum Products in Connection with Identified Uses	No hazardous substances or petroleum products were identified.
Storage Tanks and Associated Piping	No storage tanks or piping was observed except abandoned mine features.
Odors	No strong, pungent, or noxious odors were observed.
Pools of Liquid	No pools of liquid were observed.
Drums (5 gal to 55 gal containers should be described)	No drums were observed.
Potential Hazardous Substances and Petroleum Products Containers	No petroleum product containers were observed.
Unidentified Substance Containers	No unidentified containers were observed on the Subject Property.
Polychlorinated Biphenyls (PCB)	There were no transformers on the Subject Property.
Pits, Ponds, or Lagoons	None of the mine pits had filled with water.
Stained Soil or Pavement	No stained soil or pavement was observed.
Stressed Vegetation	No stressed vegetation was observed.
Solid Waste	Debris observed on the Subject Property consisted of windblown trash from the highway.
Waste Water	No wastewater discharge or standing pools were observed.
Wells	There was one monitoring well observed on the Subject Property.
Septic System	No septic systems were observed on the Subject Property.

2.8 SITE PHOTOGRAPHS

Figure 4 provides photographs that show the site conditions of the Subject Property at the time of the site visits.

- Monitoring Well (**Figure 4**, Photo 1).
- Eastern Power Line (**Figure 4**, Photo 2).
- Western Power Line (**Figure 4**, Photo 3).
- Water Main Covers (**Figure 4**, Photo 4).
- Western Serpentine Mine (**Figure 4**, Photo 5).
- Central Serpentine Mine (**Figure 4**, Photo 6).
- Soil Mound at Southern End of Subject Property, View from the North (**Figure 4a**, Photo 7).
- Tunnel into Serpentine Outcrop (**Figure 4**, Photo 8).
- Rubble-Filled Pit (**Figure 4**, Photo 9).
- Soil Mound at Southern End of Subject Property, View from the South (**Figure 4b**, Photo 10).

Figure 5 shows locations of various finds within the Subject Property.

PHOTO 1: Monitoring Well.

PHOTO 2: Eastern Power Line.

PHOTO 3: Western Power Line.

PHOTO 4: Water Main Covers

PHOTO 5: Western Serpentine Mine.

SOURCE: AES-Montrose, 9/19/2022

Figure 4a
Site Photographs

PHOTO 6: Central Serpentine Mine.

PHOTO 7: Soil Mound at Southern End of Subject Property, View from the North.

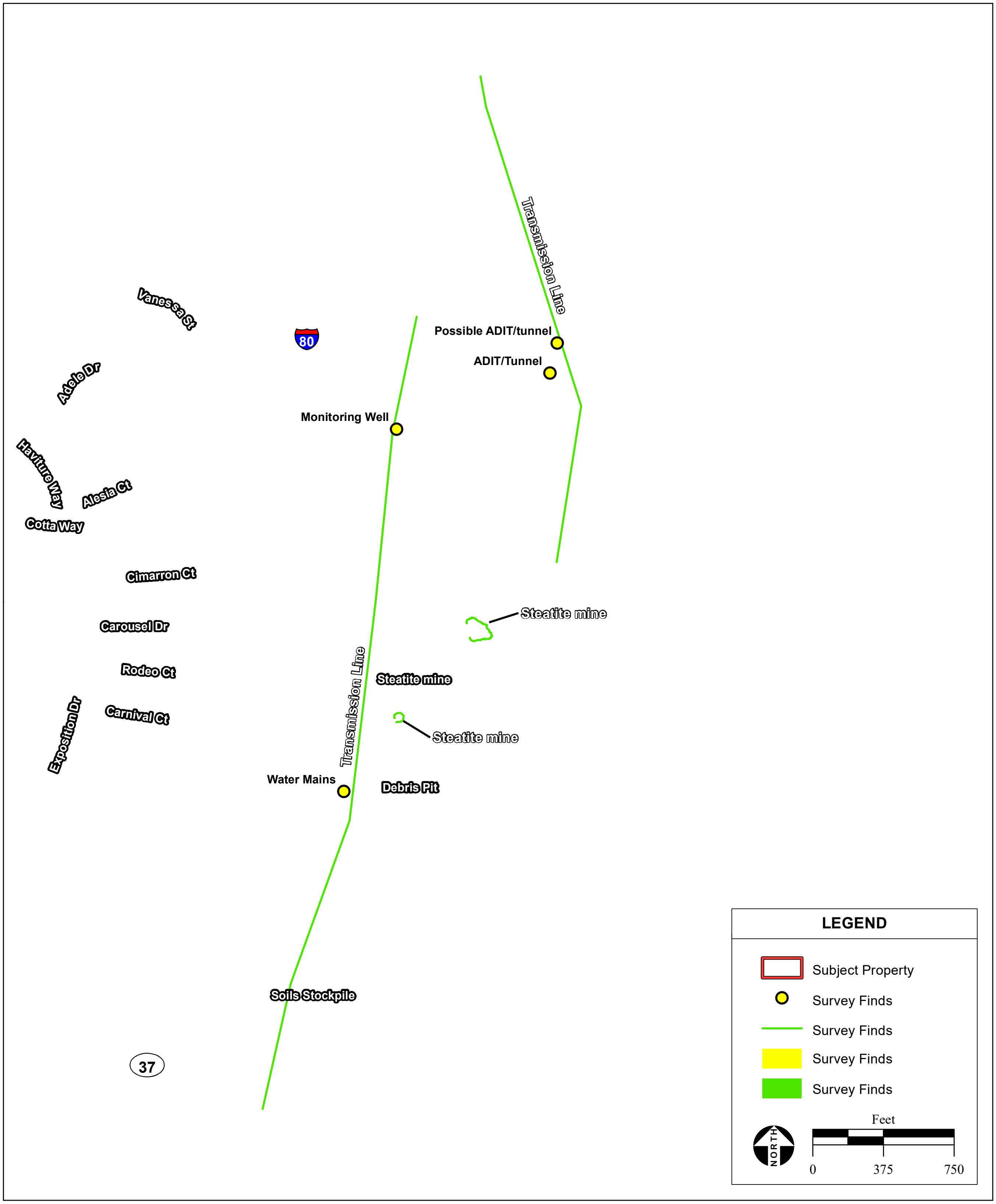
PHOTO 8: Tunnel into Serpentine Outcrop.

PHOTO 9: Rubble-Filled Pit.

PHOTO 10: Soil Mound at Southern End of Subject Property, View from the South.

SOURCE: AES-Montrose, 9/19/2022

Figure 4b
Site Photographs



SOURCE: Solano County Parcels, 2022; Vivid Advanced Maxar aerial photograph, 4/8/2021, 6/2/2021; ESRI, 2022; AES-Montrose, 9/19/2022

Figure 5
Survey Finds

SECTION 3.0

INTERVIEWS AND USER-PROVIDED INFORMATION

3.1 LOCAL ENVIRONMENTAL RECORDS SOURCES

Local Environmental Agency

The EDR Report provided searches of the available regional hazardous materials data. No documentation was found that indicates current or past use of hazardous materials on the Subject Property that would result in limitation of use.

Department of Planning and Zoning

Zoning designations on the Subject Property were reviewed through information provided by the City of Vallejo. The parcel is zoned for Commercial – Freeway (CF): Freeway Shopping and Service, as well as Mixed-Use Planned Development (MUPD) (City of Vallejo, 2022).

Electrical Utility and Natural Gas Companies

PG&E provides electrical service to vicinity of the Subject Property. High-voltage electrical utility lines run along the western edge of the Subject Property and through the north-central portion of the site.

3.2 INTERVIEWS AND QUESTIONNAIRES

Copies of questionnaires are included in **Appendix H**.

Owner/User Questionnaire and Owner Provided Information

The Owner/User questionnaire was completed by property owner Casey Spanish on August 31, 2022. In his responses, Mr. Spanish indicated he does not have specific knowledge of hazardous materials or conditions on the Subject Property.

Title Records

No title company or professional was engaged by the client to review recorded land title records and lien records. Likewise, documentation regarding property valuation was not provided nor reviewed.

Known/Reasonably Ascertainable Information and Actual Knowledge of the User

The Owner/User Questionnaire asks if the owner is aware of "commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases of hazardous materials." Mr. Spanish checked the "no" box.

Environmental Liens, Activity and Use Limitations, and Valuation Reductions

On the Owner/User Questionnaire, Mr. Spanish indicated that he was not aware of any environmental liens or activity and use limitations.

Degree of Obviousness

Mr. Spanish confirmed that based on his knowledge and experience related to the property, there are no obvious indicators that point to the presence or likely presence of hazardous materials products or petroleum product releases at the Subject Property.

Specialized Knowledge

Question 3 of the Owner/User Questionnaire states that Mr. Spanish does not have specialized knowledge of nearby properties.

Adjacent Property Owner and Agency Interviews

No adjacent property owner was interviewed. An inquiry was sent to Solano County, asking about records of hazardous materials incidents on the Subject Property. A reply was received from Alisha Seay, Environmental Health Assistant with the Hazardous Materials Section stating that the County has no records of hazardous materials issues on the Subject Property.

SECTION 4.0

RECORDS REVIEW

4.1 DATABASE SEARCH

Database searches were conducted for records of known storage tank sites and known sites of hazardous materials generation, storage, and/or contamination within 1.0 mile from the boundary of the Subject Property. The environmental database review was accomplished by using the services of a computerized search firm, EDR. EDR uses a geographic information system to plot locations of past or current hazardous materials involvement. The EDR Report was reviewed to determine if the Subject Property and adjacent sites are listed on regulatory agency databases. Although a site may be listed within a regulatory agency database, the listed site may not currently be contaminated or affect the environmental quality of the Subject Property and therefore may not be considered a REC. The regulatory agency database search is only as accurate as the data and date the data was entered into the regulatory agency-maintained database. If not reported to the appropriate regulatory agency, installation of USTs or hazardous materials releases would not be listed on the regulatory agency databases that were searched for this Phase I ESA. The purpose of the database search is to determine if the Subject Property or adjacent sites contain RECs that would impact surface and/or subsurface conditions on the Subject Property. The EDR Report includes list of known and "unmapped" or orphan sites. The Subject Property was not found on any regulatory agency databases.

The purpose of the database search is to determine if the Subject Property or adjacent sites contain RECs that would impact surface and/or subsurface conditions on the Subject Property. The EDR database report includes list of known and "unmapped" or orphan sites. The complete list of reviewed databases is provided in the EDR Report, included in **Appendix E**, and is summarized in **Table 2**.

TABLE 2: EDR SUMMARY OF AGENCY DATABASES

Regulatory Agency Database	Min. Search Distance	Property Listed	Sites Listed
RCRA-LQG	0.25 mile	No	1
RCRA-SQG	0.25 mile	No	4
Leaking Underground Storage Tanks (LUST)	0.50 mile	No	2
CPS-SLIC	0.50 mile	No	1
Aboveground Storage Tanks (AST)	0.25 mile	No	1
CERS HAZ WASTE	0.25 mile	No	6
CERS TANKS	0.25 mile	No	1
USEPA RCRA Non-Generators (NonGen) / No Longer Regulated (NLR)	0.25 mile	No	3
CA Cortese Hazardous Waste and Substances List (Cortese)	0.50 mile	No	1
HIST CORTESE	0.50 mile	No	1
		TOTAL	21

Notes: TP = Target Property
Sites may be listed in more than one database
Source: EDR, 2022 (**Appendix E)**

4.2 RECORDED HAZARDOUS MATERIALS

Subject Property

There are no hazardous materials listings within the Subject Property.

Adjacent Properties

There are nine properties listed within a 1.0-mile radius of the Subject Property because they are potential hazardous waste generators, but none have reported any leaks, spills, or other potential environmental impacts. These include Home Depot, a CVS pharmacy, Costco, Kohl's, Wilson Cornelius Ford, Best Buy, and the Vallejo Corners Dry Cleaners. All are downgradient from the Subject Property and are not RECs.

Vallejo Young U.S. Army Reserve Facility
This is site No. 48970006, as listed on the DTSC EnviroStor website (DTSC, 2023), and located approximately 1,200 feet east of the Subject Property. The facility covered approximately 4.09 acres. Sites of potential releases include a grease rack and vehicle wash rack which were constructed in the early 1960s. Both the grease rack and vehicle wash rack are not in use. A draft Preliminary Assessment (PA) was prepared in February 1999, and a final Site Investigation Work Plan was prepared in August 2000. A soil investigation was conducted to determine if releases had occurred from the grease rack or wash rack. Results of sampling conducted in 2001 identified no significant releases and a No Further Action status was approved in October 2005. This site does not pose a REC for the Subject Property.

St. John's Mercury Mine
This site is No. T10000011123 on the DWR GeoTracker website (DWR, 2023) and located approximately 4,800 feet east of the Subject Property. St. Johns is an inoperative mercury mine that was mined intermittently at the surface and underground in the 1870s and intermittently through WWII. USGS Mineral Resources Database System (MRDS) lists its productivity as medium and indicates ore was processed on site. At least two furnace sites have been identified, one likely previously removed and one with remnants on site, as well as several adits. The mine is located at the top of a hill (referred to in the literature as St. Johns Mountain) with four drainages; two are tributaries to Sulphur Springs Creek (N and E), one to American Canyon Creek (NW), and one to Rindler Creek (S); none of these drainages cross the Subject Property.

Vallejo Toyota, 1001 Admiral Callaghan Lane
This site is included on a number of listings including LUST, SWEEPS UST, CA FID UST, Cortese, HIST Cortese, and CERS; the site is 1323 feet south-southwest and downgradient from the Subject Property. This was the location of a leaking underground storage tank (LUST). The case was opened, the site was assessed, and the case was closed all in 1998, after five gasoline, diesel fuel, waste oil, new oil, and waste antifreeze were removed. The investigation found evidence of contamination at 14 feet below surface, and the water table at 6.5 feet below ground surface, however water flow is west-southwest, and therefore the Vallejo Toyota site does not pose a REC for the Subject Property (**Appendix E**).

Unmapped or Orphan Sites

One orphan site, a closed landfill, is located at Marine World Parkway and Sonoma Boulevard on State Highway 37. This is not the site of a violation, is downgradient, and is not considered a REC for the Subject Property.

Previous Environmental Studies

AES completed a Phase I ESA for the Subject Property in 2015 (AES, 2015) which was reviewed for preparation of this report.

SECTION 5.0

FINDINGS AND CONCLUSIONS

The following observations and findings were identified during the preparation of this report:

- The Subject Property contains no development; however, it has been the location of serpentine mining in the past.
- Serpentine is a source of naturally occurring asbestos.
- Surrounding properties listed in the EDR radius map report have been reviewed and no RECs have been identified in connection with the Subject Property.
- There is a well monitoring PFAS on site.

This Phase I ESA was conducted in conformance with the scope and limitations of ASTM Standard Practice E 1527-21 and the BIA Guidelines (602 DM Chapter 2). Any exceptions to, or deletions from, this practice are described in **Section 1.0** of this report. Based on information gathered while conducting this Phase I ESA, no RECs, HRECs, or CRECs were identified in connection with the Subject Property.

Based on the findings and conclusions of this Phase I ESA, the following recommendations are made:

- If ground-disturbing activities occur on the Subject Property, follow a district-approved dust control plan.
- Is recommended that the mine tailings piles on site be tested to ensure that no toxic substances are contained therein which might be a REC for the Subject Property.
- Track down monitoring well results as part of project planning.

SECTION 6.0

REPORT PREPARERS

The undersigned declare to the best of their professional opinion that they meet the definition of Environmental Professional (EP) as defined in Section 312.10 of 40 CFR 312. Charlane Gross performed the site reconnaissance and prepared this report under the professional supervision of Stephen Defibaugh, who qualifies as an EP as defined in ASTM Standard E 1527-21, and has the specific qualifications based on education, training, and experience to assess a property of the nature, and setting of the Subject Property. Resumes for the report contributors are included in **Appendix I**.

6.1 REPORT PREPARATION

AES - Montrose
1801 7th Street, Suite 100
Sacramento, CA 95811

Site Assessor: ______________ **Date:** April 24, 2023
Charlane Gross

Report Preparer: ______________ **Date:** April 24, 2023
Charlane Gross

EP: ______________ **Date:** May 3, 2023
Stephen Defibaugh

SECTION 7.0

REFERENCES

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Appendix M-2

Soil Testing Memo 2023

1631 E. Saint Andrew Place
Santa Ana, CA 92705
t 714.919.6500
f 949.988.3514

July 19, 2023

Casey Spanish
Steelman Partners
3330 W Desert Inn Road
Las Vegas, NV

Soil Sample Results
Scotts Valley
Vallejo, CA

Mr. Spanish,

Montrose Environmental (Montrose) has prepared this summary report of results of sampling at the site in Scotts Valley.

Soil Sampling

Samples were collected by excavating each location to approximately 3 to 6-inches below grade to expose fresh, near surface soil. No stained or odorous soils were observed during the sample collection activities. Montrose collected three soil samples from mine tailings stockpiles (identified as Tailing A, Tailing B, and Tailing C). Montrose composited the three individual samples into one composite sample (identified as Composite). The soil samples were collected in laboratory provided jars; soil samples selected for laboratory analysis for Volatile Organic Compounds (VOCs) were prepared in accordance with the EPA 5035 sampling method by placing 1-gram aliquots into laboratory provided vials containing preservative to comprise one sample interval. The jars and vials were immediately capped, sealed, labeled, stored in an ice chilled cooler, then delivered to an ELAP-accredited laboratory under chain-of-custody procedures, for the following analysis:

- VOCs and Total Petroleum Hydrocarbons as gasoline (TPHg) by EPA Method 8260B/5035.
- TPH for full carbon-chain speciation (including Gasoline Range Organics [GRO], Diesel Range Organics [DRO] and Oil Range Organics [ORO]), utilizing EPA Method 8015M.
- Polychlorinated biphenyls (PCBs), utilizing EPA Method 8082.
- Semi-Volatile Compounds (SVOCs), utilizing EPA Method 8270C.
- Organochlorine Pesticides (OCPs), utilizing EPA Method 8081A.
- Organophosphorous Pesticides (OPPs), utilizing EPA Method 8141A.
- Chlorinated Herbicides, utilizing EPA Method 8151A.
- California Code of Regulations Title 22 (CAM 17) Metals, utilizing EPA Method 6010B/7470A.

The sample identified as Composite was analyzed for:

- VOCs and TPHg by EPA Method 8260B/5035.
- Hexavalent Chromium, utilizing EPA Method 7199.
- Arsenic/Thallium, utilizing EPA Method 6020.

One additional sample was collected from the surface outside the stockpile (identified as Control) for laboratory analysis of VOCs and TPHg, by EPA Method 8260B/5035.

Soil Sample Analytical Results

- TPHg as analyzed by EPA 8260B was detected in three soil samples, ranging from 0.220 mg/kg in the sample identified as Tailings A, to 0.260 mg/kg in the sample identified as Control. The TPHg detections did not exceed the San Francisco Bay Regional Water Quality Control Board (RWQCB) screening level of 100 mg/kg.
- DRO was detected in the sample identified as Composite, at a concentration of 14 milligrams per kilogram (mg/kg). ORO was detected at concentrations ranging from 29 mg/kg in the sample identified as Tailings B, to 52 mg/kg in the sample identified as Composite sample. The DRO and ORO detections did not exceed the RWQCB screening level of 1,000 mg/kg.
- No other VOCs were detected in the soil samples collected and analyzed.
- Metals including arsenic and lead were detected throughout the site. Since arsenic is naturally occurring, the Department of Toxic Substance Control (DTSC) background soil screening level for arsenic in California is 12.0 mg/kg. Therefore, all detected arsenic concentrations are below the California background screening levels.
- Lead was detected at a concentration of 280 mg/kg in the sample identified as Tailing C, above the DTSC residential screening level of 80 mg/kg.
- All remaining analytical detections of metals were below their respective DTSC or EPA screening levels.
- PCBs, SVOCs, OCPs, OPPs, Chlorinated Herbicides and Hexavalent Chromium were not detected in the samples collected and analyzed.

Conclusions

Based on the soil sample results for the site, the lead detection in the sample identified as Tailings C exceeded the DTSC residential screening level of 80 mg/kg. The lead result does not exceed the industrial screening level of 500 mg/kg. Based on the proposed future use of the property, the detection of lead should be further sampled to determine the extent of impacts. In the event the site is proposed for use in an industrial scenario, the material can be managed onsite during grading. If the proposed usage for the site is residential, the lead impacts in soil at the location of Tailings C should be further delineated for removal from the site prior to site development.

Closure

Montrose appreciates the opportunity to be of service. If there are questions regarding the information contained in this report or if additional information is required, please contact either of the undersigned at (714) 919-6526.

Respectfully submitted,

Chris A. Guesnon, PG, CHG
Senior Geologist

Dane Nygaard
Senior Manager

Attachments:
Soil Sample Locations
Soil Sample Analytical Results Table
Laboratory Analytical Results

Scotts Valley Phase II Sampling

Sample ID: Tailing A **Sampling Date: 6/27/23** **Sampling Time: 0905**

Sample ID: Tailing B **Sampling Date: 6/27/23** **Sampling Time: 0941**

Sample ID: Tailing C **Sampling Date: 6/27/23** **Sampling Time: 1008**

Soil Analytical Results Table
Scotts Valley
Vallejo, California

Soil ID	Sample Date	GRO	DRO	ORO	TPH Gasoline	Mercury	Arsenic	Thallium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Test Method		**EPA 8015M**			**EPA 8260B**	**EPA 7471A**	**EPA 6020**		**EPA 6010B**															
TALING A	6/27/2023	<9.9	<9.9	**26**	**0.220**	<0.15	**7.2**	<0.97	<2.9 b	**4.7**	**660**	<0.49	<0.49	**55**	**15**	**82**	**27**	<0.97	**91**	<2.9	<0.49	<2.9	**42**	**62**
TAILING B	6/27/2023	<10	<10	**29**	<0.085	<0.16	**10**	<0.99	<3.0 b	**6.9**	**220**	<0.50	<0.50	**50**	**14**	**46**	**25**	<0.99	**86**	<3.0	<0.50	<3.0	**40**	**54**
TAILING C	6/27/2023	<9.9	<9.9	**31**	**0.230**	**0.20**	**8.4**	<0.95	**120**	**5.5**	**2,300**	<0.48	<0.48	**26**	**10**	**150**	**280**	<0.95	**46**	<2.9	<0.48	<2.9	**42**	**48**
COMPOSITE	6/27/2023	<10	**14**	**52**	NA	<0.16	**6.8**	<0.98	<2.9 b	**4.6**	**1,400**	<0.49	<0.49	**43**	**12**	**83**	**43**	<0.98	**76**	<2.9	<0.49	<2.9	**40**	**61**
CONTROL	6/27/2023	NA	NA	NA	**0.260**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Units		mg/kg																						
Regional Screening Levels	**RWQCB**	**100**	**1,000**	**1,000**	**100**	**1**	**12***	**NE**	**NE**	**12***	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
	DTSC	**NE**	**NE**	**NE**	**NE**	**1**	**12***	**NE**	**NE**	**12***	**NE**	**1,600**	**2,100**	**NE**	**NE**	**NE**	**80**	**NE**	**15,000**	**NE**	**390**	**NE**	**390**	**NE**
	EPA	**NE**	**NE**	**NE**	**NE**	**11**	**12***	**0.78**	**31**	**12***	**15,000**	**160**	**71**	**NE**	**23**	**3,100**	**400**	**390**	**1,500**	**390**	**390**	**0.78**	**390**	**23,000**

Notes:

DTSC: Department of Toxic Substances Control screening level for residential soil, cancer endpoint

EPA: Environmental Protection Agency

RWQCB: California Regional Water Quality Control Board

mg/kg: milligrams per kilogram

b = Antimony RSD between exposures exceeds limit in MET09 CCV 673260283142

GRO = gasoline range organics

DRO = diesel range organics

ORO = oil range

TPH = total petroleum hydrocarbons

* = recognized California background level

NE: Not Established

NA: Not Analyzed

RED: indicates exceedance of respective screening level

Enthalpy Analytical
931 West Barkley Ave
Orange, CA 92868
(714) 771-6900

enthalpy.com

Lab Job Number:	487562
Report Level:	II
Report Date:	07/12/2023

Analytical Report *prepared for:*

Dane Nygaard
Montrose Environmental Services
4 Park Plaza
Suite #790
Irvine, CA 92614

Location: Scotts Valley, 222535

Authorized for release by:

Patty Mata, Project Manager
patty.mata@enthalpy.com

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the above signature which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

CA ELAP# 1338, NELAP# 4038, SCAQMD LAP# 18LA0518, LACSD ID# 10105

ENTHALPY ANALYTICAL

Sample Summary

Dane Nygaard		Lab Job #:	487562
Montrose Environmental Services		Location:	Scotts Valley, 222535
4 Park Plaza		Date Received:	06/27/23
Suite #790			
Irvine, CA 92614			

Sample ID	Lab ID	Collected	Matrix
TAILING A	487562-001	06/27/23 09:05	Soil
TAILING B	487562-002	06/27/23 09:41	Soil
TAILING C	487562-003	06/27/23 10:08	Soil
COMPOSITE	487562-004	06/27/23 10:06	Soil
CONTROL	487562-005	06/27/23 10:52	Soil

Case Narrative

Montrose Environmental Services		Lab Job Number:	487562
4 Park Plaza		Location:	Scotts Valley, 222535
Suite #790		Date Received:	06/27/23
Irvine, CA 92614			
Dane Nygaard			

This data package contains sample and QC results for five soil samples, requested for the above referenced project on 06/27/23. The samples were received cold and intact. This is the full report with all requested results other than the Hexavalent Chromium tests for Tailings A, B and C that were cancelled.

TPH-Extractables by GC (EPA 8015M):
No analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B):
No analytical problems were encountered.

Semivolatile Organics by GC/MS (EPA 8270C):

- A number of samples were diluted due to the dark color of the sample extracts. Extract color and/or viscosity are used as indicators of possible matrix interference. Elevated reporting limits were due to the necessary dilution.
- No other analytical problems were encountered.

Pesticides (EPA 8081A):
No analytical problems were encountered.

PCBs (EPA 8082):
No analytical problems were encountered.

Metals (EPA 6010B, EPA 6020, and EPA 7471A):

- Low recoveries were observed for antimony in the MS/MSD for batch 317172; the parent sample was not a project sample, the LCS was within limits, and the associated RPD was within limits.
- Antimony RSD between exposures exceeds limit in MET09 CCV 673260283142; affected data was qualified with "b".
- No other analytical problems were encountered.

Hexavalent Chromium by Ion Chromatograph (EPA 7199):

- Low recovery was observed for hexavalent chromium in the matrix spike for batch 317982; the parent sample was not a project sample, and the LCS was within limits.
- No other analytical problems were encountered.

Organophosphorus Pesticides (EPA 8141A):
American Environmental Testing in Burbank, CA performed the analysis (NELAP certified). Please see the American Environmental Testing case narrative.

8151A Chlorinated Herbicides (EPA 8151A):
American Environmental Testing in Burbank, CA performed the analysis (see sublab report section for certifications). Please see the American Environmental Testing case narrative.

ENTHALPY

Enthalpy Analytical - Berkeley
2323 5th Street, Berkeley, CA 94710
Phone 510-486-0900

Chain of Custody Record
Lab No: 487562
Page: 1 of 2

Turn Around Time (rush by advanced notice only)

Standard:	X	5 Day:		3 Day:	
2 Day:		1 Day:		Custom TAT:	

Matrix: A = Air S = Soil/Solid
W = Water DW = Drinking Wate SD = Sediment
PP = Pure Product SEA = Sea Water
SW = Swab T = Tissue WP = Wipe O = Other

Preservatives:
1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3
4 = H_2SO_4 5 = NaOH 6 = Other

Sample Receipt Temp:
(lab use only)

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	LE016	Name:	Scotts Valley
Report To:	Dane Nygaard	Number:	222535
Email:	dnygaard@montrose-env.com	P.O. #:	
Address:	1631 E Saint Andrew Pl	Address:	
	Santa Ana		
Phone:	714-919-6525	Global ID:	
Fax:	714-919-6501	Sampled By:	Cory Blair

Analysis Request

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	EPA 8260B/5035 - VOCs	EPA 8015B/5035 - TPH GRO	EPA 8015B - TPH DRO/ORO	EPA 8082 - PCBs	EPA 8270C - SVOCs	EPA 8081 - Organochlorine Pesticides	EPA 6010B/7471 - CAM 17 Metals	EPA 7199 - Hexavalent Chromium	EPA 6020 - Total Arsenic Thallium	EPA 8141 - Organophosphorus Pesticides	Test Instructions / Comments
1	Tailing A	6-27-23	0905	S	2/16oz + 3VOA	6	X	X	X	X	X	X	X	X	X	X	
2	Tailing B	6-27-23	0941	S	2/16oz + 3VOA	6	X	X	X	X	X	X	X	X	X	X	
3	Tailing C	6-27-23	1008	S	2/16oz + 3VOA	6	X	X	X	X	X	X	X	X	X	X	
4	Composite	6-27-23	1006	S	1 / 16oz	6			X	X	X	X	X	X	X	X	
5	Control	6-27-23	1052	S	3 VOA	6	X	X									
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Cory Blair	Montrose / Field Tech	6-27-23 1245
1 Received By:	[signature]	Miguel Gamboa	EA	6/27/23 1245
2 Relinquished By:				
2 Received By:	[signature]	G Kim	CA	JUN 28 2023 1000
3 Relinquished By:				
3 Received By:				

ENTHALPY

Enthalpy Analytical - Berkeley
2323 5th Street, Berkeley, CA 94710
Phone 510-486-0900

Chain of Custody Record

Lab No: 487562
Page: 2 of 2

Turn Around Time (rush by advanced notice only)

Standard:	X	5 Day:		3 Day:	
2 Day:		1 Day:		Custom TAT:	

Matrix: A = Air S = Soil/Solid W = Water DW = Drinking Wate SD = Sediment PP = Pure Product SEA = Sea Water SW = Swab T = Tissue WP = Wipe O = Other

Preservatives: 1 = $Na_2S_2O_3$ 2 = HCl 3 = HNO_3 4 = H_2SO_4 5 = NaOH 6 = Other

Sample Receipt Temp: (lab use only)

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	LE016	Name:	Scotts Valley
Report To:	Dane Nygaard	Number:	222535
Email:	dnygaard@montrose-env.com	P.O. #:	
Address:	1631 E Saint Andrew Pl	Address:	
	Santa Ana		
Phone:	714-919-6525	Global ID:	
FAX:	714-919-6501	Sampled By:	Cory Blair

Analysis Request: EPA 8151 - Chlorinated Herbicides (sub)

#	Sample ID	Sampling Date	Sampling Time	Matrix	Container No. / Size	Pres.	EPA 8151 - Chlorinated Herbicides (sub)	Test Instructions / Comments
1	Tailing A	6-27-23	0905	S	2/16oz + 3 VOA	6	X	
2	Tailing B	6-27-23	0941	S	2/16oz + 3VOA	6	X	
3	Tailing C	6-27-23	1008	S	2/16oz + 3VOA	6	X	
4	Composite	6-27-23	1006	S	1/16oz	6	X	
5	~~Control~~	~~6-27-23~~	~~1052~~	~~S~~	~~3VOA~~	~~6~~	CB	
6								
7								
8								
9								
10								

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	[signature]	Cory Blair	Montrose / Field Tech	6-27-23 1245
1 Received By:	[signature]	Miguel Cowbca	EA	6/27/23 1245
2 Relinquished By:				
2 Received By:	[signature]	G'kin	CA	JUN 28 2023 1010
3 Relinquished By:				
3 Received By:				

SAMPLE RECEIPT CHECKLIST

Section 1: Login # 487562 Client: Montrose

Date Received: 6/27/23 Project: ____

ENTHALPY

Section 2: Shipping info (if applicable) ____

Are custody seals present? ☑ No, or ☐ Yes. If yes, where? ☐ on cooler, ☐ on samples, ☐ on package

☐ Date: ____ How many ____ ☐ Signature, ☐ Initials, ☐ None

Were custody seals intact upon arrival? ☐ Yes ☐ No ☐ N/A

Samples received in a cooler? ☑ Yes, how many? 1 ☐ No (**skip Section 3 below**)

If no cooler Sample Temp (°C): ____ using IR Gun # ☐ B, or ☐ C

☑ Samples received on ice directly from the field. Cooling process had begun

If in cooler: Date Opened 6/27/23 By (print) MY (sign) [signature]

Section 3: ***Important*: Notify PM if temperature exceeds 6°C or arrive frozen.**

Packing in cooler: (if other, describe) ____

☐ Bubble Wrap, ☐ Foam blocks, ☑ Bags, ☐ None, ☐ Cloth material, ☐ Cardboard, ☐ Styrofoam, ☐ Paper towels

☑ Samples received on ice directly from the field. Cooling process had begun

Type of ice used : ☑ Wet, ☐ Blue/Gel, ☐ None Temperature blank(s) included? ☐ Yes, ☐ No

Temperature measured using ☐ Thermometer ID: ____, or IR Gun # ☐ B ☐ C

Cooler Temp (°C): #1: ____, #2: ____, #3: ____, #4: ____, #5: ____, #6: ____, #7: ____

Section 4:	YES	NO	N/A
Were custody papers dry, filled out properly, and the project identifiable	✓		
Were Method 5035 sampling containers present?	✓		
If YES, what time were they transferred to freezer? 14:30			
Did all bottles arrive unbroken/unopened?	✓		
Are there any missing / extra samples?		✓	
Are samples in the appropriate containers for indicated tests?	✓		
Are sample labels present, in good condition and complete?	✓		
Does the container count match the COC?	✓		
Do the sample labels agree with custody papers?	✓		
Was sufficient amount of sample sent for tests requested?	✓		
Did you change the hold time in LIMS for unpreserved VOAs?			✓
Did you change the hold time in LIMS for preserved terracores?			✓
Are bubbles > 6mm present in VOA samples?			
Was the client contacted concerning this sample delivery?		✓	
If YES, who was called? ____ By ____ Date: ____			

Section 5:	YES	NO	N/A
Are the samples appropriately preserved? (if N/A, skip the rest of section 5)			
Did you check preservatives for all bottles for each sample?			
Did you document your preservative check?			

pH strip lot# ____, pH strip lot# ____, pH strip lot# ____

Preservative added:

☐ H2SO4 lot# ____ added to samples ____ on/at ____

☐ HCL lot# ____ added to samples ____ on/at ____

☐ HNO3 lot# ____ added to samples ____ on/at ____

☐ NaOH lot# ____ added to samples ____ on/at ____

Section 6:

Explanations/Comments: ____

Date Logged in 6/27/23 **By (print)** MY **(sign)** [signature]

Date Labeled 6-27-23 **By (print)** ABH **(sign)** [signature]

ENTHALPY
ANALYTICAL

SAMPLE ACCEPTANCE CHECKLIST

Section 1

Client: Montrose

Project: Scotts Valley, 222535

Date Received: 6/28/23

Sampler's Name Present: ☐ Yes ☐ No

Section 2

Sample(s) received in a cooler? ☑ Yes, How many? 1 ☐ No (skip section 2)

Sample Temp (°C) (No Cooler): ______

Sample Temp (°C), One from each cooler: #1: 5.1 #2: ______ #3: ______ #4: ______

(Acceptance range is < 6°C but not frozen (for Microbiology samples, acceptance range is < 10°C but not frozen). It is acceptable for samples collected the same day as sample receipt to have a higher temperature as long as there is evidence that cooling has begun.)

Shipping Information: ______

Section 3

Was the cooler packed with: ☑ Ice ☐ Ice Packs ☐ Bubble Wrap ☐ Styrofoam ☐ Paper ☐ None ☐ Other ______

Cooler Temp (°C): #1: 5.0 #2: ______ #3: ______ #4: ______

Section 4	YES	NO	N/A
Was a COC received?	✔		
Are sample IDs present?	✔		
Are sampling dates & times present?	✔		
Is a relinquished signature present?	✔		
Are the tests required clearly indicated on the COC?	✔		
Are custody seals present?	✔		
If custody seals are present, were they intact?	✔		
Are all samples sealed in plastic bags? (Recommended for Microbiology samples)			✔
Did all samples arrive intact? If no, indicate in Section 4 below.	✔		
Did all bottle labels agree with COC? (ID, dates and times)	✔		
Were the samples collected in the correct containers for the required tests?	✔		
Are the containers labeled with the correct preservatives?	✔		
Is there headspace in the VOA vials greater than 5-6 mm in diameter?			✔
Was a sufficient amount of sample submitted for the requested tests?	✔		

Section 5 Explanations/Comments

487562

8141 and 8151 subbed by Berk.

Section 6

For discrepancies, how was the Project Manager notified? ☐ Verbal PM Initials: ______ Date/Time ______

☐ Email (email sent to/on): ______ / ______

Project Manager's response:

Completed By: ______ Date: 6/28/23

Enthalpy Analytical, a subsidiary of Montrose Environmental Group ,Inc.
931 W. Barkley Ave, Orange, CA 92868 • T: (714) 771-6900 • F: (714) 538-1209
www.enthalpy.com/socal
Sample Acceptance Checklist – Rev 4, 8/8/2017

SOUTHWEST AIRLINES

Printed on:
27 JUN 19:13

526 OAK 9007 5974

SNA

@10.10

26

PC#		DG	LOT WT
5 OF	6	G	205 LB (92.9 KG)

STN	FLT	DATE	ETD	LOT 01
OAK	WN 776	28 JUN	08:25	

PC ID: 0005
PC WT: 34LB
526 90075974 0005

S

3

[redacted]

24L x 1[illegible]W x 14H

EVIDEN
TAPE

5.0/5.1

ENTHALPY ANALYTICAL

Analysis Results for 487562

Dane Nygaard
Montrose Environmental Services
4 Park Plaza
Suite #790
Irvine, CA 92614

Lab Job #: 487562
Location: Scotts Valley, 222535
Date Received: 06/27/23

Sample ID: TAILING A **Lab ID: 487562-001** **Collected: 06/27/23 09:05**
Matrix: Soil

487562-001 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA 6010B Prep Method: EPA 3050B									
Antimony	ND	b	mg/Kg	2.9	0.97	317172	06/28/23	06/30/23	SBW
Arsenic	**4.7**		mg/Kg	0.97	0.97	317172	06/28/23	06/30/23	SBW
Barium	**660**		mg/Kg	0.97	0.97	317172	06/28/23	06/30/23	SBW
Beryllium	ND		mg/Kg	0.49	0.97	317172	06/28/23	06/30/23	SBW
Cadmium	ND		mg/Kg	0.49	0.97	317172	06/28/23	06/30/23	SBW
Chromium	**55**		mg/Kg	0.97	0.97	317172	06/28/23	06/30/23	SBW
Cobalt	**15**		mg/Kg	0.49	0.97	317172	06/28/23	06/30/23	SBW
Copper	**82**		mg/Kg	0.97	0.97	317172	06/28/23	06/30/23	SBW
Lead	**27**		mg/Kg	0.97	0.97	317172	06/28/23	06/30/23	SBW
Molybdenum	ND		mg/Kg	0.97	0.97	317172	06/28/23	06/30/23	SBW
Nickel	**91**		mg/Kg	0.97	0.97	317172	06/28/23	06/30/23	SBW
Selenium	ND		mg/Kg	2.9	0.97	317172	06/28/23	06/30/23	SBW
Silver	ND		mg/Kg	0.49	0.97	317172	06/28/23	06/30/23	SBW
Thallium	ND		mg/Kg	2.9	0.97	317172	06/28/23	06/30/23	SBW
Vanadium	**42**		mg/Kg	0.97	0.97	317172	06/28/23	06/30/23	SBW
Zinc	**62**		mg/Kg	4.9	0.97	317172	06/28/23	06/30/23	SBW
Method: EPA 6020 Prep Method: EPA 3050B									
Arsenic	**7.2**		mg/Kg	0.97	0.97	317663	06/28/23	07/07/23	THP
Thallium	ND		mg/Kg	0.97	0.97	317663	06/28/23	07/07/23	THP
Method: EPA 7471A Prep Method: METHOD									
Mercury	ND		mg/Kg	0.15	1.1	317216	06/29/23	06/29/23	KAM
Method: EPA 8015M Prep Method: EPA 3580M									
GRO C8-C10	ND		mg/Kg	9.9	0.99	317357	06/30/23	07/05/23	BJG
DRO C10-C28	ND		mg/Kg	9.9	0.99	317357	06/30/23	07/05/23	BJG
ORO C28-C44	**26**		mg/Kg	20	0.99	317357	06/30/23	07/05/23	BJG
Surrogates				**Limits**					
n-Triacontane	98%		%REC	70-130	0.99	317357	06/30/23	07/05/23	BJG
Method: EPA 8081A Prep Method: EPA 3546									
alpha-BHC	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
beta-BHC	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-001 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
gamma-BHC	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
delta-BHC	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Heptachlor	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Aldrin	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Heptachlor epoxide	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Endosulfan I	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Dieldrin	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
4,4'-DDE	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Endrin	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Endosulfan II	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Endosulfan sulfate	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
4,4'-DDD	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Endrin aldehyde	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Endrin ketone	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
4,4'-DDT	ND		ug/Kg	5.0	0.99	317303	06/30/23	06/30/23	TRN
Methoxychlor	ND		ug/Kg	9.9	0.99	317303	06/30/23	06/30/23	TRN
Toxaphene	ND		ug/Kg	99	0.99	317303	06/30/23	06/30/23	TRN
Chlordane (Technical)	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Surrogates				**Limits**					
TCMX	79%		%REC	23-120	0.99	317303	06/30/23	06/30/23	TRN
Decachlorobiphenyl	65%		%REC	24-120	0.99	317303	06/30/23	06/30/23	TRN

Method: EPA 8082
Prep Method: EPA 3546

Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Aroclor-1016	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1221	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1232	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1242	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1248	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1254	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1260	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1262	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1268	ND		ug/Kg	50	0.99	317303	06/30/23	06/30/23	TRN
Surrogates				**Limits**					
Decachlorobiphenyl (PCB)	78%		%REC	19-121	0.99	317303	06/30/23	06/30/23	TRN

Method: EPA 8260B
Prep Method: EPA 5035

Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
TPH Gasoline	**220**		ug/Kg	89	0.89	317395	07/01/23	07/01/23	LYZ
Isopropyl Ether (DIPE)	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Ethyl tert-Butyl Ether (ETBE)	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Methyl tert-Amyl Ether (TAME)	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
tert-Butyl Alcohol (TBA)	ND		ug/Kg	13	0.89	317395	07/01/23	07/01/23	LYZ
Freon 12	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Chloromethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
3-Chloropropene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
cis-1,4-Dichloro-2-butene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
trans-1,4-Dichloro-2-butene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-001 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Vinyl Chloride	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Bromomethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Chloroethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Trichlorofluoromethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Acetone	ND		ug/Kg	89	0.89	317395	07/01/23	07/01/23	LYZ
Freon 113	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,1-Dichloroethene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Methylene Chloride	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
MTBE	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
trans-1,2-Dichloroethene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,1-Dichloroethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
2-Butanone	ND		ug/Kg	89	0.89	317395	07/01/23	07/01/23	LYZ
cis-1,2-Dichloroethene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
2,2-Dichloropropane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Chloroform	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Bromochloromethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,1,1-Trichloroethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,1-Dichloropropene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Carbon Tetrachloride	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2-Dichloroethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Benzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Trichloroethene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2-Dichloropropane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Bromodichloromethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Dibromomethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
4-Methyl-2-Pentanone	ND		ug/Kg	89	0.89	317395	07/01/23	07/01/23	LYZ
cis-1,3-Dichloropropene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Toluene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
trans-1,3-Dichloropropene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,1,2-Trichloroethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,3-Dichloropropane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Tetrachloroethene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Dibromochloromethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2-Dibromoethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Chlorobenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,1,1,2-Tetrachloroethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Ethylbenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
m,p-Xylenes	ND		ug/Kg	8.9	0.89	317395	07/01/23	07/01/23	LYZ
o-Xylene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Styrene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Bromoform	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Isopropylbenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,1,2,2-Tetrachloroethane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2,3-Trichloropropane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Propylbenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Bromobenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-001 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
1,3,5-Trimethylbenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
2-Chlorotoluene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
4-Chlorotoluene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
tert-Butylbenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2,4-Trimethylbenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
sec-Butylbenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
para-Isopropyl Toluene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,3-Dichlorobenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,4-Dichlorobenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
n-Butylbenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2-Dichlorobenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2-Dibromo-3-Chloropropane	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2,4-Trichlorobenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Hexachlorobutadiene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Naphthalene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
1,2,3-Trichlorobenzene	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Xylene (total)	ND		ug/Kg	4.5	0.89	317395	07/01/23	07/01/23	LYZ
Surrogates				**Limits**					
Dibromofluoromethane	101%		%REC	70-145	0.89	317395	07/01/23	07/01/23	LYZ
1,2-Dichloroethane-d4	112%		%REC	70-145	0.89	317395	07/01/23	07/01/23	LYZ
Toluene-d8	102%		%REC	70-145	0.89	317395	07/01/23	07/01/23	LYZ
Bromofluorobenzene	103%		%REC	70-145	0.89	317395	07/01/23	07/01/23	LYZ

Method: EPA 8270C
Prep Method: EPA 3546

Carbazole	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
1-Methylnaphthalene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Pyridine	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
N-Nitrosodimethylamine	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Phenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Aniline	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
bis(2-Chloroethyl)ether	ND		ug/Kg	6,000	5	317254	06/29/23	06/29/23	TJW
2-Chlorophenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
1,3-Dichlorobenzene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
1,4-Dichlorobenzene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Benzyl alcohol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
1,2-Dichlorobenzene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2-Methylphenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
bis(2-Chloroisopropyl) ether	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
3-,4-Methylphenol	ND		ug/Kg	2,000	5	317254	06/29/23	06/29/23	TJW
N-Nitroso-di-n-propylamine	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Hexachloroethane	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Nitrobenzene	ND		ug/Kg	6,000	5	317254	06/29/23	06/29/23	TJW
Isophorone	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2-Nitrophenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2,4-Dimethylphenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Benzoic acid	ND		ug/Kg	6,000	5	317254	06/29/23	06/29/23	TJW

Results for any subcontracted analyses are not included in this section.

Analysis Results for 487562

487562-001 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
bis(2-Chloroethoxy)methane	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2,4-Dichlorophenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
1,2,4-Trichlorobenzene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Naphthalene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
4-Chloroaniline	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Hexachlorobutadiene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
4-Chloro-3-methylphenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2-Methylnaphthalene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Hexachlorocyclopentadiene	ND		ug/Kg	6,000	5	317254	06/29/23	06/29/23	TJW
2,4,6-Trichlorophenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2,4,5-Trichlorophenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2-Chloronaphthalene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2-Nitroaniline	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Dimethylphthalate	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Acenaphthylene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2,6-Dinitrotoluene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
3-Nitroaniline	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Acenaphthene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2,4-Dinitrophenol	ND		ug/Kg	6,000	5	317254	06/29/23	06/29/23	TJW
4-Nitrophenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Dibenzofuran	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
2,4-Dinitrotoluene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Diethylphthalate	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Fluorene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
4-Chlorophenyl-phenylether	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
4-Nitroaniline	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
4,6-Dinitro-2-methylphenol	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
N-Nitrosodiphenylamine	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
1,2-diphenylhydrazine (as azobenzene)	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
4-Bromophenyl-phenylether	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Hexachlorobenzene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Pentachlorophenol	ND		ug/Kg	6,000	5	317254	06/29/23	06/29/23	TJW
Phenanthrene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Anthracene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Di-n-butylphthalate	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Fluoranthene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Benzidine	ND		ug/Kg	6,000	5	317254	06/29/23	06/29/23	TJW
Pyrene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Butylbenzylphthalate	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
3,3'-Dichlorobenzidine	ND		ug/Kg	6,000	5	317254	06/29/23	06/29/23	TJW
Benzo(a)anthracene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Chrysene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
bis(2-Ethylhexyl)phthalate	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Di-n-octylphthalate	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Benzo(b)fluoranthene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Benzo(k)fluoranthene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW

Results for any subcontracted analyses are not included in this section.

Analysis Results for 487562

487562-001 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Benzo(a)pyrene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Indeno(1,2,3-cd)pyrene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Dibenz(a,h)anthracene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Benzo(g,h,i)perylene	ND		ug/Kg	1,300	5	317254	06/29/23	06/29/23	TJW
Surrogates				**Limits**					
2-Fluorophenol	66%		%REC	29-120	5	317254	06/29/23	06/29/23	TJW
Phenol-d6	69%		%REC	30-120	5	317254	06/29/23	06/29/23	TJW
2,4,6-Tribromophenol	47%		%REC	32-120	5	317254	06/29/23	06/29/23	TJW
Nitrobenzene-d5	83%		%REC	33-120	5	317254	06/29/23	06/29/23	TJW
2-Fluorobiphenyl	78%		%REC	39-120	5	317254	06/29/23	06/29/23	TJW
Terphenyl-d14	76%		%REC	44-125	5	317254	06/29/23	06/29/23	TJW

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

Sample ID:	TAILING B	Lab ID:	487562-002	Collected:	06/27/23 09:41
		Matrix:	Soil		

487562-002 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA 6010B Prep Method: EPA 3050B									
Antimony	ND	b	mg/Kg	3.0	0.99	317172	06/28/23	06/30/23	SBW
Arsenic	**6.9**		mg/Kg	0.99	0.99	317172	06/28/23	06/30/23	SBW
Barium	**220**		mg/Kg	0.99	0.99	317172	06/28/23	06/30/23	SBW
Beryllium	ND		mg/Kg	0.50	0.99	317172	06/28/23	06/30/23	SBW
Cadmium	ND		mg/Kg	0.50	0.99	317172	06/28/23	06/30/23	SBW
Chromium	**50**		mg/Kg	0.99	0.99	317172	06/28/23	06/30/23	SBW
Cobalt	**14**		mg/Kg	0.50	0.99	317172	06/28/23	06/30/23	SBW
Copper	**46**		mg/Kg	0.99	0.99	317172	06/28/23	06/30/23	SBW
Lead	**25**		mg/Kg	0.99	0.99	317172	06/28/23	06/30/23	SBW
Molybdenum	ND		mg/Kg	0.99	0.99	317172	06/28/23	06/30/23	SBW
Nickel	**86**		mg/Kg	0.99	0.99	317172	06/28/23	06/30/23	SBW
Selenium	ND		mg/Kg	3.0	0.99	317172	06/28/23	06/30/23	SBW
Silver	ND		mg/Kg	0.50	0.99	317172	06/28/23	06/30/23	SBW
Thallium	ND		mg/Kg	3.0	0.99	317172	06/28/23	06/30/23	SBW
Vanadium	**40**		mg/Kg	0.99	0.99	317172	06/28/23	06/30/23	SBW
Zinc	**54**		mg/Kg	5.0	0.99	317172	06/28/23	06/30/23	SBW
Method: EPA 6020 Prep Method: EPA 3050B									
Arsenic	**10**		mg/Kg	0.99	0.99	317663	06/28/23	07/07/23	THP
Thallium	ND		mg/Kg	0.99	0.99	317663	06/28/23	07/07/23	THP
Method: EPA 7471A Prep Method: METHOD									
Mercury	ND		mg/Kg	0.16	1.1	317216	06/29/23	06/29/23	KAM
Method: EPA 8015M Prep Method: EPA 3580M									
GRO C8-C10	ND		mg/Kg	10	1	317357	06/30/23	07/05/23	BJG
DRO C10-C28	ND		mg/Kg	10	1	317357	06/30/23	07/05/23	BJG
ORO C28-C44	**29**		mg/Kg	20	1	317357	06/30/23	07/05/23	BJG
Surrogates				**Limits**					
n-Triacontane	97%		%REC	70-130	1	317357	06/30/23	07/05/23	BJG
Method: EPA 8081A Prep Method: EPA 3546									
alpha-BHC	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
beta-BHC	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
gamma-BHC	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
delta-BHC	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Heptachlor	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Aldrin	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Heptachlor epoxide	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Endosulfan I	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN

Results for any subcontracted analyses are not included in this section.

Analysis Results for 487562

487562-002 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Dieldrin	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
4,4'-DDE	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Endrin	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Endosulfan II	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Endosulfan sulfate	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
4,4'-DDD	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Endrin aldehyde	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Endrin ketone	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
4,4'-DDT	ND		ug/Kg	4.9	0.99	317303	06/30/23	06/30/23	TRN
Methoxychlor	ND		ug/Kg	9.9	0.99	317303	06/30/23	06/30/23	TRN
Toxaphene	ND		ug/Kg	99	0.99	317303	06/30/23	06/30/23	TRN
Chlordane (Technical)	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Surrogates				**Limits**					
TCMX	68%		%REC	23-120	0.99	317303	06/30/23	06/30/23	TRN
Decachlorobiphenyl	53%		%REC	24-120	0.99	317303	06/30/23	06/30/23	TRN

Method: EPA 8082
Prep Method: EPA 3546

Aroclor-1016	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1221	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1232	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1242	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1248	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1254	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1260	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1262	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Aroclor-1268	ND		ug/Kg	49	0.99	317303	06/30/23	06/30/23	TRN
Surrogates				**Limits**					
Decachlorobiphenyl (PCB)	64%		%REC	19-121	0.99	317303	06/30/23	06/30/23	TRN

Method: EPA 8260B
Prep Method: EPA 5035

TPH Gasoline	ND		ug/Kg	85	0.85	317395	07/01/23	07/01/23	LYZ
Isopropyl Ether (DIPE)	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Ethyl tert-Butyl Ether (ETBE)	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Methyl tert-Amyl Ether (TAME)	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
tert-Butyl Alcohol (TBA)	ND		ug/Kg	13	0.85	317395	07/01/23	07/01/23	LYZ
Freon 12	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Chloromethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
3-Chloropropene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
cis-1,4-Dichloro-2-butene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
trans-1,4-Dichloro-2-butene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Vinyl Chloride	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Bromomethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Chloroethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Trichlorofluoromethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Acetone	ND		ug/Kg	85	0.85	317395	07/01/23	07/01/23	LYZ
Freon 113	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-002 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
1,1-Dichloroethene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Methylene Chloride	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
MTBE	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
trans-1,2-Dichloroethene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,1-Dichloroethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
2-Butanone	ND		ug/Kg	85	0.85	317395	07/01/23	07/01/23	LYZ
cis-1,2-Dichloroethene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
2,2-Dichloropropane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Chloroform	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Bromochloromethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,1,1-Trichloroethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,1-Dichloropropene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Carbon Tetrachloride	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2-Dichloroethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Benzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Trichloroethene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2-Dichloropropane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Bromodichloromethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Dibromomethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
4-Methyl-2-Pentanone	ND		ug/Kg	85	0.85	317395	07/01/23	07/01/23	LYZ
cis-1,3-Dichloropropene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Toluene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
trans-1,3-Dichloropropene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,1,2-Trichloroethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,3-Dichloropropane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Tetrachloroethene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Dibromochloromethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2-Dibromoethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Chlorobenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,1,1,2-Tetrachloroethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Ethylbenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
m,p-Xylenes	ND		ug/Kg	8.5	0.85	317395	07/01/23	07/01/23	LYZ
o-Xylene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Styrene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Bromoform	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Isopropylbenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,1,2,2-Tetrachloroethane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2,3-Trichloropropane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Propylbenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Bromobenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,3,5-Trimethylbenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
2-Chlorotoluene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
4-Chlorotoluene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
tert-Butylbenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2,4-Trimethylbenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
sec-Butylbenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-002 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
para-Isopropyl Toluene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,3-Dichlorobenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,4-Dichlorobenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
n-Butylbenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2-Dichlorobenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2-Dibromo-3-Chloropropane	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2,4-Trichlorobenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Hexachlorobutadiene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Naphthalene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
1,2,3-Trichlorobenzene	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Xylene (total)	ND		ug/Kg	4.2	0.85	317395	07/01/23	07/01/23	LYZ
Surrogates				**Limits**					
Dibromofluoromethane	100%		%REC	70-145	0.85	317395	07/01/23	07/01/23	LYZ
1,2-Dichloroethane-d4	110%		%REC	70-145	0.85	317395	07/01/23	07/01/23	LYZ
Toluene-d8	100%		%REC	70-145	0.85	317395	07/01/23	07/01/23	LYZ
Bromofluorobenzene	100%		%REC	70-145	0.85	317395	07/01/23	07/01/23	LYZ

Method: EPA 8270C
Prep Method: EPA 3546

Carbazole	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
1-Methylnaphthalene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Pyridine	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
N-Nitrosodimethylamine	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Phenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Aniline	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
bis(2-Chloroethyl)ether	ND		ug/Kg	6,100	5.1	317254	06/29/23	06/30/23	TJW
2-Chlorophenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
1,3-Dichlorobenzene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
1,4-Dichlorobenzene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Benzyl alcohol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
1,2-Dichlorobenzene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2-Methylphenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
bis(2-Chloroisopropyl) ether	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
3-,4-Methylphenol	ND		ug/Kg	2,000	5.1	317254	06/29/23	06/30/23	TJW
N-Nitroso-di-n-propylamine	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Hexachloroethane	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Nitrobenzene	ND		ug/Kg	6,100	5.1	317254	06/29/23	06/30/23	TJW
Isophorone	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2-Nitrophenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2,4-Dimethylphenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Benzoic acid	ND		ug/Kg	6,100	5.1	317254	06/29/23	06/30/23	TJW
bis(2-Chloroethoxy)methane	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2,4-Dichlorophenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
1,2,4-Trichlorobenzene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Naphthalene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
4-Chloroaniline	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Hexachlorobutadiene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-002 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
4-Chloro-3-methylphenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2-Methylnaphthalene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Hexachlorocyclopentadiene	ND		ug/Kg	6,100	5.1	317254	06/29/23	06/30/23	TJW
2,4,6-Trichlorophenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2,4,5-Trichlorophenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2-Chloronaphthalene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2-Nitroaniline	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Dimethylphthalate	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Acenaphthylene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2,6-Dinitrotoluene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
3-Nitroaniline	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Acenaphthene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2,4-Dinitrophenol	ND		ug/Kg	6,100	5.1	317254	06/29/23	06/30/23	TJW
4-Nitrophenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Dibenzofuran	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
2,4-Dinitrotoluene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Diethylphthalate	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Fluorene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
4-Chlorophenyl-phenylether	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
4-Nitroaniline	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
4,6-Dinitro-2-methylphenol	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
N-Nitrosodiphenylamine	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
1,2-diphenylhydrazine (as azobenzene)	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
4-Bromophenyl-phenylether	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Hexachlorobenzene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Pentachlorophenol	ND		ug/Kg	6,100	5.1	317254	06/29/23	06/30/23	TJW
Phenanthrene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Anthracene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Di-n-butylphthalate	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Fluoranthene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Benzidine	ND		ug/Kg	6,100	5.1	317254	06/29/23	06/30/23	TJW
Pyrene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Butylbenzylphthalate	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
3,3'-Dichlorobenzidine	ND		ug/Kg	6,100	5.1	317254	06/29/23	06/30/23	TJW
Benzo(a)anthracene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Chrysene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
bis(2-Ethylhexyl)phthalate	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Di-n-octylphthalate	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Benzo(b)fluoranthene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Benzo(k)fluoranthene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Benzo(a)pyrene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Indeno(1,2,3-cd)pyrene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Dibenz(a,h)anthracene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Benzo(g,h,i)perylene	ND		ug/Kg	1,300	5.1	317254	06/29/23	06/30/23	TJW
Surrogates				**Limits**					
2-Fluorophenol	67%		%REC	29-120	5.1	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

Analysis Results for 487562

487562-002 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Phenol-d6	68%		%REC	30-120	5.1	317254	06/29/23	06/30/23	TJW
2,4,6-Tribromophenol	52%		%REC	32-120	5.1	317254	06/29/23	06/30/23	TJW
Nitrobenzene-d5	78%		%REC	33-120	5.1	317254	06/29/23	06/30/23	TJW
2-Fluorobiphenyl	74%		%REC	39-120	5.1	317254	06/29/23	06/30/23	TJW
Terphenyl-d14	77%		%REC	44-125	5.1	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

Sample ID: TAILING C	Lab ID: 487562-003	Collected: 06/27/23 10:08
	Matrix: Soil	

487562-003 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA 6010B Prep Method: EPA 3050B									
Antimony	**120**		mg/Kg	29	9.5	317172	06/28/23	07/06/23	SBW
Arsenic	**5.5**		mg/Kg	0.95	0.95	317172	06/28/23	06/30/23	SBW
Barium	**2,300**		mg/Kg	9.5	9.5	317172	06/28/23	07/05/23	SBW
Beryllium	ND		mg/Kg	0.48	0.95	317172	06/28/23	06/30/23	SBW
Cadmium	ND		mg/Kg	0.48	0.95	317172	06/28/23	06/30/23	SBW
Chromium	**26**		mg/Kg	0.95	0.95	317172	06/28/23	06/30/23	SBW
Cobalt	**10**		mg/Kg	0.48	0.95	317172	06/28/23	06/30/23	SBW
Copper	**150**		mg/Kg	0.95	0.95	317172	06/28/23	06/30/23	SBW
Lead	**280**		mg/Kg	0.95	0.95	317172	06/28/23	06/30/23	SBW
Molybdenum	ND		mg/Kg	0.95	0.95	317172	06/28/23	06/30/23	SBW
Nickel	**46**		mg/Kg	0.95	0.95	317172	06/28/23	06/30/23	SBW
Selenium	ND		mg/Kg	2.9	0.95	317172	06/28/23	06/30/23	SBW
Silver	ND		mg/Kg	0.48	0.95	317172	06/28/23	06/30/23	SBW
Thallium	ND		mg/Kg	2.9	0.95	317172	06/28/23	06/30/23	SBW
Vanadium	**42**		mg/Kg	0.95	0.95	317172	06/28/23	06/30/23	SBW
Zinc	**48**		mg/Kg	4.8	0.95	317172	06/28/23	06/30/23	SBW
Method: EPA 6020 Prep Method: EPA 3050B									
Arsenic	**8.4**		mg/Kg	0.95	0.95	317663	06/28/23	07/07/23	THP
Thallium	ND		mg/Kg	0.95	0.95	317663	06/28/23	07/07/23	THP
Method: EPA 7471A Prep Method: METHOD									
Mercury	**0.20**		mg/Kg	0.14	1	317216	06/29/23	06/29/23	KAM
Method: EPA 8015M Prep Method: EPA 3580M									
GRO C8-C10	ND		mg/Kg	9.9	0.99	317357	06/30/23	07/05/23	BJG
DRO C10-C28	ND		mg/Kg	9.9	0.99	317357	06/30/23	07/05/23	BJG
ORO C28-C44	**31**		mg/Kg	20	0.99	317357	06/30/23	07/05/23	BJG
Surrogates				**Limits**					
n-Triacontane	95%		%REC	70-130	0.99	317357	06/30/23	07/05/23	BJG
Method: EPA 8081A Prep Method: EPA 3546									
alpha-BHC	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
beta-BHC	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
gamma-BHC	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
delta-BHC	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Heptachlor	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Aldrin	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Heptachlor epoxide	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endosulfan I	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-003 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Dieldrin	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
4,4'-DDE	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endrin	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endosulfan II	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endosulfan sulfate	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
4,4'-DDD	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endrin aldehyde	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endrin ketone	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
4,4'-DDT	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Methoxychlor	ND		ug/Kg	9.8	0.98	317303	06/30/23	06/30/23	TRN
Toxaphene	ND		ug/Kg	98	0.98	317303	06/30/23	06/30/23	TRN
Chlordane (Technical)	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Surrogates				**Limits**					
TCMX	77%		%REC	23-120	0.98	317303	06/30/23	06/30/23	TRN
Decachlorobiphenyl	70%		%REC	24-120	0.98	317303	06/30/23	06/30/23	TRN

Method: EPA 8082
Prep Method: EPA 3546

Aroclor-1016	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1221	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1232	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1242	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1248	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1254	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1260	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1262	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1268	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Surrogates				**Limits**					
Decachlorobiphenyl (PCB)	86%		%REC	19-121	0.98	317303	06/30/23	06/30/23	TRN

Method: EPA 8260B
Prep Method: EPA 5035

TPH Gasoline	**230**		ug/Kg	96	0.96	317395	07/01/23	07/01/23	LYZ
Isopropyl Ether (DIPE)	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Ethyl tert-Butyl Ether (ETBE)	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Methyl tert-Amyl Ether (TAME)	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
tert-Butyl Alcohol (TBA)	ND		ug/Kg	14	0.96	317395	07/01/23	07/01/23	LYZ
Freon 12	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Chloromethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
3-Chloropropene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
cis-1,4-Dichloro-2-butene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
trans-1,4-Dichloro-2-butene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Vinyl Chloride	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Bromomethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Chloroethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Trichlorofluoromethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Acetone	ND		ug/Kg	96	0.96	317395	07/01/23	07/01/23	LYZ
Freon 113	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ

Results for any subcontracted analyses are not included in this section.

Analysis Results for 487562

487562-003 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
1,1-Dichloroethene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Methylene Chloride	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
MTBE	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
trans-1,2-Dichloroethene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,1-Dichloroethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
2-Butanone	ND		ug/Kg	96	0.96	317395	07/01/23	07/01/23	LYZ
cis-1,2-Dichloroethene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
2,2-Dichloropropane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Chloroform	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Bromochloromethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,1,1-Trichloroethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,1-Dichloropropene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Carbon Tetrachloride	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2-Dichloroethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Benzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Trichloroethene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2-Dichloropropane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Bromodichloromethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Dibromomethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
4-Methyl-2-Pentanone	ND		ug/Kg	96	0.96	317395	07/01/23	07/01/23	LYZ
cis-1,3-Dichloropropene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Toluene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
trans-1,3-Dichloropropene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,1,2-Trichloroethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,3-Dichloropropane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Tetrachloroethene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Dibromochloromethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2-Dibromoethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Chlorobenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,1,1,2-Tetrachloroethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Ethylbenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
m,p-Xylenes	ND		ug/Kg	9.6	0.96	317395	07/01/23	07/01/23	LYZ
o-Xylene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Styrene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Bromoform	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Isopropylbenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,1,2,2-Tetrachloroethane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2,3-Trichloropropane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Propylbenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Bromobenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,3,5-Trimethylbenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
2-Chlorotoluene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
4-Chlorotoluene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
tert-Butylbenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2,4-Trimethylbenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
sec-Butylbenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-003 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
para-Isopropyl Toluene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,3-Dichlorobenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,4-Dichlorobenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
n-Butylbenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2-Dichlorobenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2-Dibromo-3-Chloropropane	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2,4-Trichlorobenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Hexachlorobutadiene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Naphthalene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
1,2,3-Trichlorobenzene	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Xylene (total)	ND		ug/Kg	4.8	0.96	317395	07/01/23	07/01/23	LYZ
Surrogates				**Limits**					
Dibromofluoromethane	102%		%REC	70-145	0.96	317395	07/01/23	07/01/23	LYZ
1,2-Dichloroethane-d4	112%		%REC	70-145	0.96	317395	07/01/23	07/01/23	LYZ
Toluene-d8	101%		%REC	70-145	0.96	317395	07/01/23	07/01/23	LYZ
Bromofluorobenzene	97%		%REC	70-145	0.96	317395	07/01/23	07/01/23	LYZ

Method: EPA 8270C
Prep Method: EPA 3546

Carbazole	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
1-Methylnaphthalene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Pyridine	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
N-Nitrosodimethylamine	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Phenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Aniline	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
bis(2-Chloroethyl)ether	ND		ug/Kg	2,400	2	317254	06/29/23	06/30/23	TJW
2-Chlorophenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
1,3-Dichlorobenzene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
1,4-Dichlorobenzene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Benzyl alcohol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
1,2-Dichlorobenzene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2-Methylphenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
bis(2-Chloroisopropyl) ether	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
3-,4-Methylphenol	ND		ug/Kg	800	2	317254	06/29/23	06/30/23	TJW
N-Nitroso-di-n-propylamine	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Hexachloroethane	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Nitrobenzene	ND		ug/Kg	2,400	2	317254	06/29/23	06/30/23	TJW
Isophorone	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2-Nitrophenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2,4-Dimethylphenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Benzoic acid	ND		ug/Kg	2,400	2	317254	06/29/23	06/30/23	TJW
bis(2-Chloroethoxy)methane	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2,4-Dichlorophenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
1,2,4-Trichlorobenzene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Naphthalene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
4-Chloroaniline	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Hexachlorobutadiene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

Analysis Results for 487562

487562-003 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
4-Chloro-3-methylphenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2-Methylnaphthalene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Hexachlorocyclopentadiene	ND		ug/Kg	2,400	2	317254	06/29/23	06/30/23	TJW
2,4,6-Trichlorophenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2,4,5-Trichlorophenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2-Chloronaphthalene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2-Nitroaniline	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Dimethylphthalate	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Acenaphthylene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2,6-Dinitrotoluene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
3-Nitroaniline	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Acenaphthene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2,4-Dinitrophenol	ND		ug/Kg	2,400	2	317254	06/29/23	06/30/23	TJW
4-Nitrophenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Dibenzofuran	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
2,4-Dinitrotoluene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Diethylphthalate	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Fluorene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
4-Chlorophenyl-phenylether	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
4-Nitroaniline	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
4,6-Dinitro-2-methylphenol	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
N-Nitrosodiphenylamine	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
1,2-diphenylhydrazine (as azobenzene)	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
4-Bromophenyl-phenylether	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Hexachlorobenzene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Pentachlorophenol	ND		ug/Kg	2,400	2	317254	06/29/23	06/30/23	TJW
Phenanthrene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Anthracene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Di-n-butylphthalate	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Fluoranthene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Benzidine	ND		ug/Kg	2,400	2	317254	06/29/23	06/30/23	TJW
Pyrene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Butylbenzylphthalate	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
3,3'-Dichlorobenzidine	ND		ug/Kg	2,400	2	317254	06/29/23	06/30/23	TJW
Benzo(a)anthracene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Chrysene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
bis(2-Ethylhexyl)phthalate	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Di-n-octylphthalate	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Benzo(b)fluoranthene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Benzo(k)fluoranthene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Benzo(a)pyrene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Indeno(1,2,3-cd)pyrene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Dibenz(a,h)anthracene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Benzo(g,h,i)perylene	ND		ug/Kg	500	2	317254	06/29/23	06/30/23	TJW
Surrogates				**Limits**					
2-Fluorophenol	55%		%REC	29-120	2	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

Analysis Results for 487562

487562-003 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Phenol-d6	60%		%REC	30-120	2	317254	06/29/23	06/30/23	TJW
2,4,6-Tribromophenol	49%		%REC	32-120	2	317254	06/29/23	06/30/23	TJW
Nitrobenzene-d5	79%		%REC	33-120	2	317254	06/29/23	06/30/23	TJW
2-Fluorobiphenyl	75%		%REC	39-120	2	317254	06/29/23	06/30/23	TJW
Terphenyl-d14	76%		%REC	44-125	2	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

Sample ID: COMPOSITE	Lab ID: 487562-004	Collected: 06/27/23 10:06
	Matrix: Soil	

487562-004 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA 6010B Prep Method: EPA 3050B									
Antimony	ND	b	mg/Kg	2.9	0.98	317172	06/28/23	06/30/23	SBW
Arsenic	**4.6**		mg/Kg	0.98	0.98	317172	06/28/23	06/30/23	SBW
Barium	**1,400**		mg/Kg	9.8	9.8	317172	06/28/23	07/05/23	SBW
Beryllium	ND		mg/Kg	0.49	0.98	317172	06/28/23	06/30/23	SBW
Cadmium	ND		mg/Kg	0.49	0.98	317172	06/28/23	06/30/23	SBW
Chromium	**43**		mg/Kg	0.98	0.98	317172	06/28/23	06/30/23	SBW
Cobalt	**12**		mg/Kg	0.49	0.98	317172	06/28/23	06/30/23	SBW
Copper	**83**		mg/Kg	0.98	0.98	317172	06/28/23	06/30/23	SBW
Lead	**43**		mg/Kg	0.98	0.98	317172	06/28/23	06/30/23	SBW
Molybdenum	ND		mg/Kg	0.98	0.98	317172	06/28/23	06/30/23	SBW
Nickel	**76**		mg/Kg	0.98	0.98	317172	06/28/23	06/30/23	SBW
Selenium	ND		mg/Kg	2.9	0.98	317172	06/28/23	06/30/23	SBW
Silver	ND		mg/Kg	0.49	0.98	317172	06/28/23	06/30/23	SBW
Thallium	ND		mg/Kg	2.9	0.98	317172	06/28/23	06/30/23	SBW
Vanadium	**40**		mg/Kg	0.98	0.98	317172	06/28/23	06/30/23	SBW
Zinc	**61**		mg/Kg	4.9	0.98	317172	06/28/23	06/30/23	SBW
Method: EPA 6020 Prep Method: EPA 3050B									
Arsenic	**6.8**		mg/Kg	0.98	0.98	317663	06/28/23	07/07/23	THP
Thallium	ND		mg/Kg	0.98	0.98	317663	06/28/23	07/07/23	THP
Method: EPA 7199 Prep Method: METHOD									
Hexavalent Chromium	ND		mg/Kg	0.40	1	317982	07/12/23 11:03	07/12/23 16:34	PAS
Method: EPA 7471A Prep Method: METHOD									
Mercury	ND		mg/Kg	0.16	1.1	317216	06/29/23	06/29/23	KAM
Method: EPA 8015M Prep Method: EPA 3580M									
GRO C8-C10	ND		mg/Kg	10	1	317357	06/30/23	07/05/23	BJG
DRO C10-C28	**14**		mg/Kg	10	1	317357	06/30/23	07/05/23	BJG
ORO C28-C44	**52**		mg/Kg	20	1	317357	06/30/23	07/05/23	BJG
Surrogates				**Limits**					
n-Triacontane	102%		%REC	70-130	1	317357	06/30/23	07/05/23	BJG
Method: EPA 8081A Prep Method: EPA 3546									
alpha-BHC	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
beta-BHC	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
gamma-BHC	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
delta-BHC	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Heptachlor	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-004 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Aldrin	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Heptachlor epoxide	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endosulfan I	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Dieldrin	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
4,4'-DDE	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endrin	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endosulfan II	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endosulfan sulfate	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
4,4'-DDD	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endrin aldehyde	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Endrin ketone	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
4,4'-DDT	ND		ug/Kg	4.9	0.98	317303	06/30/23	06/30/23	TRN
Methoxychlor	ND		ug/Kg	9.8	0.98	317303	06/30/23	06/30/23	TRN
Toxaphene	ND		ug/Kg	98	0.98	317303	06/30/23	06/30/23	TRN
Chlordane (Technical)	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Surrogates				**Limits**					
TCMX	69%		%REC	23-120	0.98	317303	06/30/23	06/30/23	TRN
Decachlorobiphenyl	63%		%REC	24-120	0.98	317303	06/30/23	06/30/23	TRN

Method: EPA 8082
Prep Method: EPA 3546

Aroclor-1016	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1221	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1232	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1242	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1248	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1254	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1260	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1262	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Aroclor-1268	ND		ug/Kg	49	0.98	317303	06/30/23	06/30/23	TRN
Surrogates				**Limits**					
Decachlorobiphenyl (PCB)	76%		%REC	19-121	0.98	317303	06/30/23	06/30/23	TRN

Method: EPA 8270C
Prep Method: EPA 3546

Carbazole	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
1-Methylnaphthalene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Pyridine	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
N-Nitrosodimethylamine	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Phenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Aniline	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
bis(2-Chloroethyl)ether	ND		ug/Kg	12,000	10	317254	06/29/23	06/30/23	TJW
2-Chlorophenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
1,3-Dichlorobenzene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
1,4-Dichlorobenzene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Benzyl alcohol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
1,2-Dichlorobenzene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2-Methylphenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-004 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
bis(2-Chloroisopropyl) ether	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
3-,4-Methylphenol	ND		ug/Kg	4,000	10	317254	06/29/23	06/30/23	TJW
N-Nitroso-di-n-propylamine	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Hexachloroethane	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Nitrobenzene	ND		ug/Kg	12,000	10	317254	06/29/23	06/30/23	TJW
Isophorone	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2-Nitrophenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2,4-Dimethylphenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Benzoic acid	ND		ug/Kg	12,000	10	317254	06/29/23	06/30/23	TJW
bis(2-Chloroethoxy)methane	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2,4-Dichlorophenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
1,2,4-Trichlorobenzene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Naphthalene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
4-Chloroaniline	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Hexachlorobutadiene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
4-Chloro-3-methylphenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2-Methylnaphthalene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Hexachlorocyclopentadiene	ND		ug/Kg	12,000	10	317254	06/29/23	06/30/23	TJW
2,4,6-Trichlorophenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2,4,5-Trichlorophenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2-Chloronaphthalene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2-Nitroaniline	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Dimethylphthalate	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Acenaphthylene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2,6-Dinitrotoluene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
3-Nitroaniline	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Acenaphthene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2,4-Dinitrophenol	ND		ug/Kg	12,000	10	317254	06/29/23	06/30/23	TJW
4-Nitrophenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Dibenzofuran	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
2,4-Dinitrotoluene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Diethylphthalate	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Fluorene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
4-Chlorophenyl-phenylether	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
4-Nitroaniline	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
4,6-Dinitro-2-methylphenol	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
N-Nitrosodiphenylamine	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
1,2-diphenylhydrazine (as azobenzene)	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
4-Bromophenyl-phenylether	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Hexachlorobenzene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Pentachlorophenol	ND		ug/Kg	12,000	10	317254	06/29/23	06/30/23	TJW
Phenanthrene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Anthracene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Di-n-butylphthalate	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Fluoranthene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Benzidine	ND		ug/Kg	12,000	10	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

Analysis Results for 487562

487562-004 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Pyrene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Butylbenzylphthalate	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
3,3'-Dichlorobenzidine	ND		ug/Kg	12,000	10	317254	06/29/23	06/30/23	TJW
Benzo(a)anthracene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Chrysene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
bis(2-Ethylhexyl)phthalate	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Di-n-octylphthalate	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Benzo(b)fluoranthene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Benzo(k)fluoranthene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Benzo(a)pyrene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Indeno(1,2,3-cd)pyrene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Dibenz(a,h)anthracene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Benzo(g,h,i)perylene	ND		ug/Kg	2,500	10	317254	06/29/23	06/30/23	TJW
Surrogates				**Limits**					
2-Fluorophenol	78%		%REC	29-120	10	317254	06/29/23	06/30/23	TJW
Phenol-d6	80%		%REC	30-120	10	317254	06/29/23	06/30/23	TJW
2,4,6-Tribromophenol	60%		%REC	32-120	10	317254	06/29/23	06/30/23	TJW
Nitrobenzene-d5	93%		%REC	33-120	10	317254	06/29/23	06/30/23	TJW
2-Fluorobiphenyl	84%		%REC	39-120	10	317254	06/29/23	06/30/23	TJW
Terphenyl-d14	85%		%REC	44-125	10	317254	06/29/23	06/30/23	TJW

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

Sample ID: CONTROL	Lab ID: 487562-005	Collected: 06/27/23 10:52
	Matrix: Soil	

487562-005 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA 8260B Prep Method: EPA 5035									
TPH Gasoline	**260**		ug/Kg	95	0.95	317395	07/01/23	07/01/23	LYZ
Isopropyl Ether (DIPE)	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Ethyl tert-Butyl Ether (ETBE)	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Methyl tert-Amyl Ether (TAME)	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
tert-Butyl Alcohol (TBA)	ND		ug/Kg	14	0.95	317395	07/01/23	07/01/23	LYZ
Freon 12	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Chloromethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
3-Chloropropene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
cis-1,4-Dichloro-2-butene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
trans-1,4-Dichloro-2-butene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Vinyl Chloride	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Bromomethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Chloroethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Trichlorofluoromethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Acetone	ND		ug/Kg	95	0.95	317395	07/01/23	07/01/23	LYZ
Freon 113	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,1-Dichloroethene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Methylene Chloride	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
MTBE	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
trans-1,2-Dichloroethene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,1-Dichloroethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
2-Butanone	ND		ug/Kg	95	0.95	317395	07/01/23	07/01/23	LYZ
cis-1,2-Dichloroethene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
2,2-Dichloropropane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Chloroform	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Bromochloromethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,1,1-Trichloroethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,1-Dichloropropene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Carbon Tetrachloride	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2-Dichloroethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Benzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Trichloroethene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2-Dichloropropane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Bromodichloromethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Dibromomethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
4-Methyl-2-Pentanone	ND		ug/Kg	95	0.95	317395	07/01/23	07/01/23	LYZ
cis-1,3-Dichloropropene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Toluene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
trans-1,3-Dichloropropene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,1,2-Trichloroethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Analysis Results for 487562

487562-005 Analyte	Result	Qual	Units	RL	DF	Batch	Prepared	Analyzed	Chemist
1,3-Dichloropropane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Tetrachloroethene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Dibromochloromethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2-Dibromoethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Chlorobenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,1,1,2-Tetrachloroethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Ethylbenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
m,p-Xylenes	ND		ug/Kg	9.5	0.95	317395	07/01/23	07/01/23	LYZ
o-Xylene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Styrene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Bromoform	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Isopropylbenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,1,2,2-Tetrachloroethane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2,3-Trichloropropane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Propylbenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Bromobenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,3,5-Trimethylbenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
2-Chlorotoluene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
4-Chlorotoluene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
tert-Butylbenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2,4-Trimethylbenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
sec-Butylbenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
para-Isopropyl Toluene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,3-Dichlorobenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,4-Dichlorobenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
n-Butylbenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2-Dichlorobenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2-Dibromo-3-Chloropropane	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2,4-Trichlorobenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Hexachlorobutadiene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Naphthalene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
1,2,3-Trichlorobenzene	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Xylene (total)	ND		ug/Kg	4.7	0.95	317395	07/01/23	07/01/23	LYZ
Surrogates				**Limits**					
Dibromofluoromethane	101%		%REC	70-145	0.95	317395	07/01/23	07/01/23	LYZ
1,2-Dichloroethane-d4	114%		%REC	70-145	0.95	317395	07/01/23	07/01/23	LYZ
Toluene-d8	100%		%REC	70-145	0.95	317395	07/01/23	07/01/23	LYZ
Bromofluorobenzene	103%		%REC	70-145	0.95	317395	07/01/23	07/01/23	LYZ

ND Not Detected
b See narrative

Results for any subcontracted analyses are not included in this section.

ENTHALPY ANALYTICAL

Batch QC

Type:	Blank	Lab ID:	QC1076627	Batch:	317172
Matrix:	Soil	Method:	EPA 6010B	Prep Method:	EPA 3050B

QC1076627 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Antimony	ND		mg/Kg	3.0	06/28/23	07/05/23
Arsenic	ND		mg/Kg	1.0	06/28/23	06/30/23
Barium	ND		mg/Kg	1.0	06/28/23	06/30/23
Beryllium	ND		mg/Kg	0.50	06/28/23	06/30/23
Cadmium	ND		mg/Kg	0.50	06/28/23	06/30/23
Chromium	ND		mg/Kg	1.0	06/28/23	06/30/23
Cobalt	ND		mg/Kg	0.50	06/28/23	06/30/23
Copper	ND		mg/Kg	1.0	06/28/23	06/30/23
Lead	ND		mg/Kg	1.0	06/28/23	06/30/23
Molybdenum	ND		mg/Kg	1.0	06/28/23	06/30/23
Nickel	ND		mg/Kg	1.0	06/28/23	06/30/23
Selenium	ND		mg/Kg	3.0	06/28/23	06/30/23
Silver	ND		mg/Kg	0.50	06/28/23	06/30/23
Thallium	ND		mg/Kg	3.0	06/28/23	06/30/23
Vanadium	ND		mg/Kg	1.0	06/28/23	06/30/23
Zinc	ND		mg/Kg	5.0	06/28/23	06/30/23

Type:	Lab Control Sample	Lab ID:	QC1076628	Batch:	317172
Matrix:	Soil	Method:	EPA 6010B	Prep Method:	EPA 3050B

QC1076628 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
Antimony	88.30	100.0	mg/Kg	88%		80-120
Arsenic	85.36	100.0	mg/Kg	85%		80-120
Barium	91.81	100.0	mg/Kg	92%		80-120
Beryllium	88.49	100.0	mg/Kg	88%		80-120
Cadmium	90.30	100.0	mg/Kg	90%		80-120
Chromium	87.37	100.0	mg/Kg	87%		80-120
Cobalt	94.32	100.0	mg/Kg	94%		80-120
Copper	87.49	100.0	mg/Kg	87%		80-120
Lead	93.81	100.0	mg/Kg	94%		80-120
Molybdenum	86.36	100.0	mg/Kg	86%		80-120
Nickel	92.45	100.0	mg/Kg	92%		80-120
Selenium	82.48	100.0	mg/Kg	82%		80-120
Silver	39.98	50.00	mg/Kg	80%		80-120
Thallium	90.21	100.0	mg/Kg	90%		80-120
Vanadium	88.63	100.0	mg/Kg	89%		80-120
Zinc	91.63	100.0	mg/Kg	92%		80-120

ENTHALPY ANALYTICAL

Batch QC

Type:	Matrix Spike	Lab ID:	QC1076629	Batch:	317172
Matrix (Source ID):	Soil (487589-001)	Method:	EPA 6010B	Prep Method:	EPA 3050B

QC1076629 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Antimony	33.86	ND	98.04	mg/Kg	35%	*	75-125	0.98
Arsenic	83.05	2.412	98.04	mg/Kg	82%		75-125	0.98
Barium	184.4	84.62	98.04	mg/Kg	102%		75-125	0.98
Beryllium	85.79	0.2691	98.04	mg/Kg	87%		75-125	0.98
Cadmium	84.53	0.07139	98.04	mg/Kg	86%		75-125	0.98
Chromium	105.3	19.35	98.04	mg/Kg	88%		75-125	0.98
Cobalt	95.44	6.571	98.04	mg/Kg	91%		75-125	0.98
Copper	108.4	12.35	98.04	mg/Kg	98%		75-125	0.98
Lead	91.13	5.030	98.04	mg/Kg	88%		75-125	0.98
Molybdenum	78.62	ND	98.04	mg/Kg	80%		75-125	0.98
Nickel	104.7	18.70	98.04	mg/Kg	88%		75-125	0.98
Selenium	76.83	0.5258	98.04	mg/Kg	78%		75-125	0.98
Silver	42.50	ND	49.02	mg/Kg	87%		75-125	0.98
Thallium	84.85	ND	98.04	mg/Kg	87%		75-125	0.98
Vanadium	123.1	25.92	98.04	mg/Kg	99%		75-125	0.98
Zinc	141.3	43.71	98.04	mg/Kg	100%		75-125	0.98

Type:	Matrix Spike Duplicate	Lab ID:	QC1076630	Batch:	317172
Matrix (Source ID):	Soil (487589-001)	Method:	EPA 6010B	Prep Method:	EPA 3050B

QC1076630 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim	DF
Antimony	38.88	ND	98.04	mg/Kg	40%	*	75-125	14	41	0.98
Arsenic	85.91	2.412	98.04	mg/Kg	85%		75-125	3	35	0.98
Barium	160.7	84.62	98.04	mg/Kg	78%		75-125	14	20	0.98
Beryllium	88.90	0.2691	98.04	mg/Kg	90%		75-125	4	20	0.98
Cadmium	88.25	0.07139	98.04	mg/Kg	90%		75-125	4	20	0.98
Chromium	105.1	19.35	98.04	mg/Kg	88%		75-125	0	20	0.98
Cobalt	97.28	6.571	98.04	mg/Kg	93%		75-125	2	20	0.98
Copper	105.8	12.35	98.04	mg/Kg	95%		75-125	2	20	0.98
Lead	93.18	5.030	98.04	mg/Kg	90%		75-125	2	20	0.98
Molybdenum	81.99	ND	98.04	mg/Kg	84%		75-125	4	20	0.98
Nickel	105.6	18.70	98.04	mg/Kg	89%		75-125	1	20	0.98
Selenium	80.02	0.5258	98.04	mg/Kg	81%		75-125	4	20	0.98
Silver	43.45	ND	49.02	mg/Kg	89%		75-125	2	20	0.98
Thallium	88.24	ND	98.04	mg/Kg	90%		75-125	4	20	0.98
Vanadium	115.9	25.92	98.04	mg/Kg	92%		75-125	6	20	0.98
Zinc	131.8	43.71	98.04	mg/Kg	90%		75-125	7	20	0.98

Batch QC

Type: Post Digest Spike	Lab ID: QC1076631	Batch: 317172
Matrix (Source ID): Soil (487589-001)	Method: EPA 6010B	Prep Method: EPA 3050B

QC1076631 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Antimony	86.23	ND	95.24	mg/Kg	91%		75-125	0.95
Arsenic	89.32	2.412	95.24	mg/Kg	91%		75-125	0.95
Barium	201.0	84.62	95.24	mg/Kg	122%		75-125	0.95
Beryllium	88.77	0.2691	95.24	mg/Kg	93%		75-125	0.95
Cadmium	87.17	0.07139	95.24	mg/Kg	91%		75-125	0.95
Chromium	112.0	19.35	95.24	mg/Kg	97%		75-125	0.95
Cobalt	99.63	6.571	95.24	mg/Kg	98%		75-125	0.95
Copper	112.7	12.35	95.24	mg/Kg	105%		75-125	0.95
Lead	95.41	5.030	95.24	mg/Kg	95%		75-125	0.95
Molybdenum	88.76	ND	95.24	mg/Kg	93%		75-125	0.95
Nickel	111.7	18.70	95.24	mg/Kg	98%		75-125	0.95
Selenium	82.37	0.5258	95.24	mg/Kg	86%		75-125	0.95
Silver	45.39	ND	47.62	mg/Kg	95%		75-125	0.95
Thallium	87.80	ND	95.24	mg/Kg	92%		75-125	0.95
Vanadium	124.3	25.92	95.24	mg/Kg	103%		75-125	0.95
Zinc	146.9	43.71	95.24	mg/Kg	108%		75-125	0.95

Type: Blank	Lab ID: QC1078243	Batch: 317663
Matrix: Soil	Method: EPA 6020	Prep Method: EPA 3050B

QC1078243 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Arsenic	ND		mg/Kg	1.0	06/28/23	07/07/23
Thallium	ND		mg/Kg	1.0	06/28/23	07/07/23

Type: Lab Control Sample	Lab ID: QC1078244	Batch: 317663
Matrix: Soil	Method: EPA 6020	Prep Method: EPA 3050B

QC1078244 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
Arsenic	97.92	100.0	mg/Kg	98%		80-120
Thallium	96.10	100.0	mg/Kg	96%		80-120

Type: Matrix Spike	Lab ID: QC1078647	Batch: 317663
Matrix (Source ID): Soil (488098-001)	Method: EPA 6020	Prep Method: EPA 3050B

QC1078647 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Arsenic	101.8	3.805	98.04	mg/Kg	100%		75-125	0.98
Thallium	97.72	ND	98.04	mg/Kg	100%		75-125	0.98

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Batch QC

Type:	Matrix Spike Duplicate	Lab ID:	QC1078648	Batch:	317663
Matrix (Source ID):	Soil (488098-001)	Method:	EPA 6020	Prep Method:	EPA 3050B

QC1078648 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim	DF
Arsenic	100.3	3.805	98.04	mg/Kg	98%		75-125	1	20	0.98
Thallium	96.96	ND	98.04	mg/Kg	99%		75-125	1	20	0.98

Type:	Post Digest Spike	Lab ID:	QC1078651	Batch:	317663
Matrix (Source ID):	Soil (488098-001)	Method:	EPA 6020	Prep Method:	EPA 3050B

QC1078651 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Arsenic	96.57	3.805	95.24	mg/Kg	97%		75-125	0.95
Thallium	90.79	ND	95.24	mg/Kg	95%		75-125	0.95

Type:	Blank	Lab ID:	QC1079212	Batch:	317982
Matrix:	Soil	Method:	EPA 7199	Prep Method:	METHOD

QC1079212 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Hexavalent Chromium	ND		mg/Kg	0.40	07/12/23 11:03	07/12/23 15:18

Type:	Lab Control Sample	Lab ID:	QC1079213	Batch:	317982
Matrix:	Soil	Method:	EPA 7199	Prep Method:	METHOD

QC1079213 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
Hexavalent Chromium	43.09	40.00	mg/Kg	108%		80-120

Type:	Sample Duplicate	Lab ID:	QC1079214	Batch:	317982
Matrix (Source ID):	Miscell. (487847-001)	Method:	EPA 7199	Prep Method:	METHOD

QC1079214 Analyte	Result	Source Sample Result	Units	Qual	RPD	RPD Lim	DF
Hexavalent Chromium	ND	ND	mg/Kg			30	1

Type:	Sample Spike	Lab ID:	QC1079215	Batch:	317982
Matrix (Source ID):	Miscell. (487847-001)	Method:	EPA 7199	Prep Method:	METHOD

QC1079215 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Hexavalent Chromium	1.396	0.02769	40.32	mg/Kg	3%	*	70-130	2

Batch QC

Type:	Post Digest Spike	Lab ID:	QC1079216	Batch:	317982
Matrix (Source ID):	Miscell. (487847-001)	Method:	EPA 7199	Prep Method:	METHOD

QC1079216 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Hexavalent Chromium	41.13	0.02769	41.15	mg/Kg	100%		75-125	2.1

Type:	Blank	Lab ID:	QC1076789	Batch:	317216
Matrix:	Soil	Method:	EPA 7471A	Prep Method:	METHOD

QC1076789 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Mercury	ND		mg/Kg	0.14	06/29/23	06/29/23

Type:	Lab Control Sample	Lab ID:	QC1076790	Batch:	317216
Matrix:	Soil	Method:	EPA 7471A	Prep Method:	METHOD

QC1076790 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
Mercury	0.8251	0.8333	mg/Kg	99%		80-120

Type:	Matrix Spike	Lab ID:	QC1076791	Batch:	317216
Matrix (Source ID):	Soil (487578-022)	Method:	EPA 7471A	Prep Method:	METHOD

QC1076791 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Mercury	0.9237	0.01981	0.9615	mg/Kg	94%		75-125	1.2

Type:	Matrix Spike Duplicate	Lab ID:	QC1076792	Batch:	317216
Matrix (Source ID):	Soil (487578-022)	Method:	EPA 7471A	Prep Method:	METHOD

QC1076792 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim	DF
Mercury	0.8470	0.01981	0.8929	mg/Kg	93%		75-125	1	20	1.1

Type:	Blank	Lab ID:	QC1077234	Batch:	317357
Matrix:	Soil	Method:	EPA 8015M	Prep Method:	EPA 3580M

QC1077234 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
GRO C8-C10	ND		mg/Kg	10	06/30/23	06/30/23
DRO C10-C28	ND		mg/Kg	10	06/30/23	06/30/23
ORO C28-C44	ND		mg/Kg	20	06/30/23	06/30/23
Surrogates				**Limits**		
n-Triacontane	112%		%REC	70-130	06/30/23	06/30/23

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Batch QC

Type:	Lab Control Sample	Lab ID:	QC1077235	Batch:	317357
Matrix:	Soil	Method:	EPA 8015M	Prep Method:	EPA 3580M

QC1077235 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
Diesel C10-C28	250.0	249.1	mg/Kg	100%		76-122
Surrogates						
n-Triacontane	9.921	9.965	mg/Kg	100%		70-130

Type:	Matrix Spike	Lab ID:	QC1077236	Batch:	317357
Matrix (Source ID):	Soil (487613-001)	Method:	EPA 8015M	Prep Method:	EPA 3580M

QC1077236 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Diesel C10-C28	314.7	13.38	249.6	mg/Kg	121%		62-126	1
Surrogates								
n-Triacontane	10.17		9.985	mg/Kg	102%		70-130	1

Type:	Matrix Spike Duplicate	Lab ID:	QC1077237	Batch:	317357
Matrix (Source ID):	Soil (487613-001)	Method:	EPA 8015M	Prep Method:	EPA 3580M

QC1077237 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim	DF
Diesel C10-C28	258.0	13.38	249.6	mg/Kg	98%		62-126	20	35	1
Surrogates										
n-Triacontane	9.555		9.985	mg/Kg	96%		70-130			1

Batch QC

Type:	Blank	Lab ID:	QC1077119	Batch:	317303
Matrix:	Soil				

QC1077119 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Method: EPA 8081A Prep Method: EPA 3546						
alpha-BHC	ND		ug/Kg	4.9	06/30/23	06/30/23
beta-BHC	ND		ug/Kg	4.9	06/30/23	06/30/23
gamma-BHC	ND		ug/Kg	4.9	06/30/23	06/30/23
delta-BHC	ND		ug/Kg	4.9	06/30/23	06/30/23
Heptachlor	ND		ug/Kg	4.9	06/30/23	06/30/23
Aldrin	ND		ug/Kg	4.9	06/30/23	06/30/23
Heptachlor epoxide	ND		ug/Kg	4.9	06/30/23	06/30/23
Endosulfan I	ND		ug/Kg	4.9	06/30/23	06/30/23
Dieldrin	ND		ug/Kg	4.9	06/30/23	06/30/23
4,4'-DDE	ND		ug/Kg	4.9	06/30/23	06/30/23
Endrin	ND		ug/Kg	4.9	06/30/23	06/30/23
Endosulfan II	ND		ug/Kg	4.9	06/30/23	06/30/23
Endosulfan sulfate	ND		ug/Kg	4.9	06/30/23	06/30/23
4,4'-DDD	ND		ug/Kg	4.9	06/30/23	06/30/23
Endrin aldehyde	ND		ug/Kg	4.9	06/30/23	06/30/23
Endrin ketone	ND		ug/Kg	4.9	06/30/23	06/30/23
4,4'-DDT	ND		ug/Kg	4.9	06/30/23	06/30/23
Methoxychlor	ND		ug/Kg	9.9	06/30/23	06/30/23
Toxaphene	ND		ug/Kg	99	06/30/23	06/30/23
Chlordane (Technical)	ND		ug/Kg	49	06/30/23	06/30/23
Surrogates				**Limits**		
TCMX	73%		%REC	23-120	06/30/23	06/30/23
Decachlorobiphenyl	82%		%REC	24-120	06/30/23	06/30/23
Method: EPA 8082 Prep Method: EPA 3546						
Aroclor-1016	ND		ug/Kg	49	06/30/23	06/30/23
Aroclor-1221	ND		ug/Kg	49	06/30/23	06/30/23
Aroclor-1232	ND		ug/Kg	49	06/30/23	06/30/23
Aroclor-1242	ND		ug/Kg	49	06/30/23	06/30/23
Aroclor-1248	ND		ug/Kg	49	06/30/23	06/30/23
Aroclor-1254	ND		ug/Kg	49	06/30/23	06/30/23
Aroclor-1260	ND		ug/Kg	49	06/30/23	06/30/23
Aroclor-1262	ND		ug/Kg	49	06/30/23	06/30/23
Aroclor-1268	ND		ug/Kg	49	06/30/23	06/30/23
Surrogates				**Limits**		
Decachlorobiphenyl (PCB)	87%		%REC	19-121	06/30/23	06/30/23

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Batch QC

Type:	Lab Control Sample	Lab ID:	QC1077120	Batch:	317303
Matrix:	Soil	Method:	EPA 8081A	Prep Method:	EPA 3546

QC1077120 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
alpha-BHC	44.05	49.90	ug/Kg	88%		22-129
beta-BHC	41.54	49.90	ug/Kg	83%		28-125
gamma-BHC	42.64	49.90	ug/Kg	85%		22-128
delta-BHC	43.96	49.90	ug/Kg	88%		24-131
Heptachlor	42.07	49.90	ug/Kg	84%		18-124
Aldrin	33.51	49.90	ug/Kg	67%		23-120
Heptachlor epoxide	41.35	49.90	ug/Kg	83%		26-120
Endosulfan I	43.43	49.90	ug/Kg	87%		25-126
Dieldrin	45.10	49.90	ug/Kg	90%		23-124
4,4'-DDE	45.35	49.90	ug/Kg	91%		28-121
Endrin	50.55	49.90	ug/Kg	101%		25-127
Endosulfan II	50.63	49.90	ug/Kg	101%		29-121
Endosulfan sulfate	49.44	49.90	ug/Kg	99%		30-121
4,4'-DDD	51.62	49.90	ug/Kg	103%		26-120
Endrin aldehyde	37.02	49.90	ug/Kg	74%	#	10-120
Endrin ketone	51.81	49.90	ug/Kg	104%		28-125
4,4'-DDT	54.32	49.90	ug/Kg	109%	#	22-125
Methoxychlor	57.35	49.90	ug/Kg	115%	#	28-130
Surrogates						
TCMX	39.13	49.90	ug/Kg	78%		23-120
Decachlorobiphenyl	44.43	49.90	ug/Kg	89%		24-120

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Batch QC

Type:	Matrix Spike	Lab ID:	QC1077121	Batch:	317303
Matrix (Source ID):	Soil (487614-001)	Method:	EPA 8081A	Prep Method:	EPA 3546

QC1077121 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
alpha-BHC	30.60	2.661	49.07	ug/Kg	57%		46-120	0.98
beta-BHC	30.00	2.720	49.07	ug/Kg	56%		41-120	0.98
gamma-BHC	34.46	ND	49.07	ug/Kg	70%		41-120	0.98
delta-BHC	38.05	3.762	49.07	ug/Kg	70%		38-123	0.98
Heptachlor	30.09	ND	49.07	ug/Kg	61%		39-120	0.98
Aldrin	32.00	ND	49.07	ug/Kg	65%		34-120	0.98
Heptachlor epoxide	28.17	ND	49.07	ug/Kg	57%		43-120	0.98
Endosulfan I	31.07	ND	49.07	ug/Kg	63%		45-120	0.98
Dieldrin	34.17	ND	49.07	ug/Kg	70%		45-120	0.98
4,4'-DDE	56.42	19.18	49.07	ug/Kg	76%		34-120	0.98
Endrin	37.23	ND	49.07	ug/Kg	76%		40-120	0.98
Endosulfan II	38.17	ND	49.07	ug/Kg	78%		41-120	0.98
Endosulfan sulfate	35.72	ND	49.07	ug/Kg	73%		42-120	0.98
4,4'-DDD	37.63	2.654	49.07	ug/Kg	71%		41-120	0.98
Endrin aldehyde	28.94	3.507	49.07	ug/Kg	52%	#	30-120	0.98
Endrin ketone	42.34	ND	49.07	ug/Kg	86%		45-120	0.98
4,4'-DDT	65.41	11.02	49.07	ug/Kg	111%	#	35-127	0.98
Methoxychlor	50.41	ND	49.07	ug/Kg	103%	#	42-136	0.98
Surrogates								
TCMX	28.35		49.07	ug/Kg	58%		23-120	0.98
Decachlorobiphenyl	38.19		49.07	ug/Kg	78%		24-120	0.98

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Batch QC

Type:	**Matrix Spike Duplicate**	**Lab ID:**	**QC1077122**	**Batch:**	**317303**
Matrix (Source ID):	**Soil (487614-001)**	**Method:**	**EPA 8081A**	**Prep Method:**	**EPA 3546**

QC1077122 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim	DF
alpha-BHC	28.29	2.661	49.95	ug/Kg	51%		46-120	10	30	1
beta-BHC	26.99	2.720	49.95	ug/Kg	49%		41-120	12	30	1
gamma-BHC	30.25	ND	49.95	ug/Kg	61%		41-120	15	30	1
delta-BHC	31.49	3.762	49.95	ug/Kg	56%		38-123	21	30	1
Heptachlor	26.69	ND	49.95	ug/Kg	53%		39-120	14	30	1
Aldrin	28.59	ND	49.95	ug/Kg	57%		34-120	13	30	1
Heptachlor epoxide	26.53	ND	49.95	ug/Kg	53%		43-120	8	30	1
Endosulfan I	27.92	ND	49.95	ug/Kg	56%		45-120	12	30	1
Dieldrin	29.06	ND	49.95	ug/Kg	58%		45-120	18	30	1
4,4'-DDE	48.51	19.18	49.95	ug/Kg	59%		34-120	16	30	1
Endrin	34.33	ND	49.95	ug/Kg	69%		40-120	10	30	1
Endosulfan II	33.38	ND	49.95	ug/Kg	67%		41-120	15	30	1
Endosulfan sulfate	27.77	ND	49.95	ug/Kg	56%		42-120	27	30	1
4,4'-DDD	32.56	2.654	49.95	ug/Kg	60%		41-120	16	30	1
Endrin aldehyde	23.98	3.507	49.95	ug/Kg	41%	#	30-120	20	30	1
Endrin ketone	34.41	ND	49.95	ug/Kg	69%		45-120	22	30	1
4,4'-DDT	54.49	11.02	49.95	ug/Kg	87%	#	35-127	20	30	1
Methoxychlor	43.09	ND	49.95	ug/Kg	86%	#	42-136	17	30	1
Surrogates										
TCMX	25.14		49.95	ug/Kg	50%		23-120			1
Decachlorobiphenyl	32.08		49.95	ug/Kg	64%		24-120			1

Type:	**Lab Control Sample**	**Lab ID:**	**QC1077123**	**Batch:**	**317303**
Matrix:	**Soil**	**Method:**	**EPA 8082**	**Prep Method:**	**EPA 3546**

QC1077123 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
Aroclor-1016	403.0	497.0	ug/Kg	81%		14-150
Aroclor-1260	467.7	497.0	ug/Kg	94%		10-150
Surrogates						
Decachlorobiphenyl (PCB)	44.21	49.70	ug/Kg	89%		19-121

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Batch QC

Type:	**Matrix Spike**	**Lab ID:**	**QC1077124**	**Batch:**	**317303**
Matrix (Source ID):	**Soil (487614-001)**	**Method:**	**EPA 8082**	**Prep Method:**	**EPA 3546**

QC1077124 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Aroclor-1016	326.1	ND	495.5	ug/Kg	66%		42-127	0.99
Aroclor-1260	422.5	ND	495.5	ug/Kg	85%		38-130	0.99
Surrogates								
Decachlorobiphenyl (PCB)	41.27		49.55	ug/Kg	83%		19-121	0.99

Type:	**Matrix Spike Duplicate**	**Lab ID:**	**QC1077125**	**Batch:**	**317303**
Matrix (Source ID):	**Soil (487614-001)**	**Method:**	**EPA 8082**	**Prep Method:**	**EPA 3546**

QC1077125 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim	DF
Aroclor-1016	348.9	ND	494.1	ug/Kg	71%		42-127	7	30	0.99
Aroclor-1260	426.9	ND	494.1	ug/Kg	86%		38-130	1	30	0.99
Surrogates										
Decachlorobiphenyl (PCB)	37.79		49.41	ug/Kg	76%		19-121			0.99

Type:	**Lab Control Sample**	**Lab ID:**	**QC1077363**	**Batch:**	**317395**
Matrix:	**Soil**	**Method:**	**EPA 8260B**	**Prep Method:**	**EPA 5035**

QC1077363 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
TPH Gasoline	537.8	500.0	ug/Kg	108%		70-130
Surrogates						
Dibromofluoromethane	49.82	50.00	ug/Kg	100%		70-130
1,2-Dichloroethane-d4	52.16	50.00	ug/Kg	104%		70-145
Toluene-d8	49.40	50.00	ug/Kg	99%		70-145
Bromofluorobenzene	48.39	50.00	ug/Kg	97%		70-145

Type:	**Lab Control Sample Duplicate**	**Lab ID:**	**QC1077364**	**Batch:**	**317395**
Matrix:	**Soil**	**Method:**	**EPA 8260B**	**Prep Method:**	**EPA 5035**

QC1077364 Analyte	Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim
TPH Gasoline	485.3	500.0	ug/Kg	97%		70-130	10	20
Surrogates								
Dibromofluoromethane	49.82	50.00	ug/Kg	100%		70-130		
1,2-Dichloroethane-d4	51.78	50.00	ug/Kg	104%		70-145		
Toluene-d8	49.78	50.00	ug/Kg	100%		70-145		
Bromofluorobenzene	49.76	50.00	ug/Kg	100%		70-145		

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Batch QC

Type:	Lab Control Sample	Lab ID:	QC1077365	Batch:	317395
Matrix:	Soil	Method:	EPA 8260B	Prep Method:	EPA 5035

QC1077365 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
1,1-Dichloroethene	45.40	50.00	ug/Kg	91%		70-131
MTBE	41.26	50.00	ug/Kg	83%		69-130
Benzene	41.77	50.00	ug/Kg	84%		70-130
Trichloroethene	42.59	50.00	ug/Kg	85%		70-130
Toluene	42.71	50.00	ug/Kg	85%		70-130
Chlorobenzene	42.53	50.00	ug/Kg	85%		70-130
Surrogates						
Dibromofluoromethane	51.72	50.00	ug/Kg	103%		70-130
1,2-Dichloroethane-d4	53.19	50.00	ug/Kg	106%		70-145
Toluene-d8	49.45	50.00	ug/Kg	99%		70-145
Bromofluorobenzene	51.03	50.00	ug/Kg	102%		70-145

ENTHALPY ANALYTICAL

Batch QC

Type:	Blank	Lab ID:	QC1077366	Batch:	317395
Matrix:	Soil	Method:	EPA 8260B	Prep Method:	EPA 5035

QC1077366 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
TPH Gasoline	ND		ug/Kg	100	07/01/23	07/01/23
Isopropyl Ether (DIPE)	ND		ug/Kg	5.0	07/01/23	07/01/23
Ethyl tert-Butyl Ether (ETBE)	ND		ug/Kg	5.0	07/01/23	07/01/23
Methyl tert-Amyl Ether (TAME)	ND		ug/Kg	5.0	07/01/23	07/01/23
tert-Butyl Alcohol (TBA)	ND		ug/Kg	15	07/01/23	07/01/23
Freon 12	ND		ug/Kg	5.0	07/01/23	07/01/23
Chloromethane	ND		ug/Kg	5.0	07/01/23	07/01/23
3-Chloropropene	ND		ug/Kg	5.0	07/01/23	07/01/23
cis-1,4-Dichloro-2-butene	ND		ug/Kg	5.0	07/01/23	07/01/23
trans-1,4-Dichloro-2-butene	ND		ug/Kg	5.0	07/01/23	07/01/23
Vinyl Chloride	ND		ug/Kg	5.0	07/01/23	07/01/23
Bromomethane	ND		ug/Kg	5.0	07/01/23	07/01/23
Chloroethane	ND		ug/Kg	5.0	07/01/23	07/01/23
Trichlorofluoromethane	ND		ug/Kg	5.0	07/01/23	07/01/23
Acetone	ND		ug/Kg	100	07/01/23	07/01/23
Freon 113	ND		ug/Kg	5.0	07/01/23	07/01/23
1,1-Dichloroethene	ND		ug/Kg	5.0	07/01/23	07/01/23
Methylene Chloride	ND		ug/Kg	5.0	07/01/23	07/01/23
MTBE	ND		ug/Kg	5.0	07/01/23	07/01/23
trans-1,2-Dichloroethene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,1-Dichloroethane	ND		ug/Kg	5.0	07/01/23	07/01/23
2-Butanone	ND		ug/Kg	100	07/01/23	07/01/23
cis-1,2-Dichloroethene	ND		ug/Kg	5.0	07/01/23	07/01/23
2,2-Dichloropropane	ND		ug/Kg	5.0	07/01/23	07/01/23
Chloroform	ND		ug/Kg	5.0	07/01/23	07/01/23
Bromochloromethane	ND		ug/Kg	5.0	07/01/23	07/01/23
1,1,1-Trichloroethane	ND		ug/Kg	5.0	07/01/23	07/01/23
1,1-Dichloropropene	ND		ug/Kg	5.0	07/01/23	07/01/23
Carbon Tetrachloride	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2-Dichloroethane	ND		ug/Kg	5.0	07/01/23	07/01/23
Benzene	ND		ug/Kg	5.0	07/01/23	07/01/23
Trichloroethene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2-Dichloropropane	ND		ug/Kg	5.0	07/01/23	07/01/23
Bromodichloromethane	ND		ug/Kg	5.0	07/01/23	07/01/23
Dibromomethane	ND		ug/Kg	5.0	07/01/23	07/01/23
4-Methyl-2-Pentanone	ND		ug/Kg	100	07/01/23	07/01/23
cis-1,3-Dichloropropene	ND		ug/Kg	5.0	07/01/23	07/01/23
Toluene	ND		ug/Kg	5.0	07/01/23	07/01/23
trans-1,3-Dichloropropene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,1,2-Trichloroethane	ND		ug/Kg	5.0	07/01/23	07/01/23
1,3-Dichloropropane	ND		ug/Kg	5.0	07/01/23	07/01/23
Tetrachloroethene	ND		ug/Kg	5.0	07/01/23	07/01/23

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Batch QC

QC1077366 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Dibromochloromethane	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2-Dibromoethane	ND		ug/Kg	5.0	07/01/23	07/01/23
Chlorobenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,1,1,2-Tetrachloroethane	ND		ug/Kg	5.0	07/01/23	07/01/23
Ethylbenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
m,p-Xylenes	ND		ug/Kg	10	07/01/23	07/01/23
o-Xylene	ND		ug/Kg	5.0	07/01/23	07/01/23
Styrene	ND		ug/Kg	5.0	07/01/23	07/01/23
Bromoform	ND		ug/Kg	5.0	07/01/23	07/01/23
Isopropylbenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,1,2,2-Tetrachloroethane	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2,3-Trichloropropane	ND		ug/Kg	5.0	07/01/23	07/01/23
Propylbenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
Bromobenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,3,5-Trimethylbenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
2-Chlorotoluene	ND		ug/Kg	5.0	07/01/23	07/01/23
4-Chlorotoluene	ND		ug/Kg	5.0	07/01/23	07/01/23
tert-Butylbenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2,4-Trimethylbenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
sec-Butylbenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
para-Isopropyl Toluene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,3-Dichlorobenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,4-Dichlorobenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
n-Butylbenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2-Dichlorobenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2-Dibromo-3-Chloropropane	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2,4-Trichlorobenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
Hexachlorobutadiene	ND		ug/Kg	5.0	07/01/23	07/01/23
Naphthalene	ND		ug/Kg	5.0	07/01/23	07/01/23
1,2,3-Trichlorobenzene	ND		ug/Kg	5.0	07/01/23	07/01/23
Xylene (total)	ND		ug/Kg	5.0	07/01/23	07/01/23
Surrogates				**Limits**		
Dibromofluoromethane	99%		%REC	70-130	07/01/23	07/01/23
1,2-Dichloroethane-d4	101%		%REC	70-145	07/01/23	07/01/23
Toluene-d8	99%		%REC	70-145	07/01/23	07/01/23
Bromofluorobenzene	98%		%REC	70-145	07/01/23	07/01/23

Batch QC

Type: Blank	Lab ID: QC1077367	Batch: 317395
Matrix: Soil	Method: EPA 8260B	Prep Method: EPA 5035

QC1077367 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
TPH Gasoline	ND		ug/Kg	5,000	07/01/23	07/01/23
Isopropyl Ether (DIPE)	ND		ug/Kg	250	07/01/23	07/01/23
Ethyl tert-Butyl Ether (ETBE)	ND		ug/Kg	250	07/01/23	07/01/23
Methyl tert-Amyl Ether (TAME)	ND		ug/Kg	250	07/01/23	07/01/23
tert-Butyl Alcohol (TBA)	ND		ug/Kg	750	07/01/23	07/01/23
Freon 12	ND		ug/Kg	250	07/01/23	07/01/23
Chloromethane	ND		ug/Kg	250	07/01/23	07/01/23
3-Chloropropene	ND		ug/Kg	250	07/01/23	07/01/23
cis-1,4-Dichloro-2-butene	ND		ug/Kg	250	07/01/23	07/01/23
trans-1,4-Dichloro-2-butene	ND		ug/Kg	250	07/01/23	07/01/23
Vinyl Chloride	ND		ug/Kg	250	07/01/23	07/01/23
Bromomethane	ND		ug/Kg	250	07/01/23	07/01/23
Chloroethane	ND		ug/Kg	250	07/01/23	07/01/23
Trichlorofluoromethane	ND		ug/Kg	250	07/01/23	07/01/23
Acetone	ND		ug/Kg	5,000	07/01/23	07/01/23
Freon 113	ND		ug/Kg	250	07/01/23	07/01/23
1,1-Dichloroethene	ND		ug/Kg	250	07/01/23	07/01/23
Methylene Chloride	ND		ug/Kg	250	07/01/23	07/01/23
MTBE	ND		ug/Kg	250	07/01/23	07/01/23
trans-1,2-Dichloroethene	ND		ug/Kg	250	07/01/23	07/01/23
1,1-Dichloroethane	ND		ug/Kg	250	07/01/23	07/01/23
2-Butanone	ND		ug/Kg	5,000	07/01/23	07/01/23
cis-1,2-Dichloroethene	ND		ug/Kg	250	07/01/23	07/01/23
2,2-Dichloropropane	ND		ug/Kg	250	07/01/23	07/01/23
Chloroform	ND		ug/Kg	250	07/01/23	07/01/23
Bromochloromethane	ND		ug/Kg	250	07/01/23	07/01/23
1,1,1-Trichloroethane	ND		ug/Kg	250	07/01/23	07/01/23
1,1-Dichloropropene	ND		ug/Kg	250	07/01/23	07/01/23
Carbon Tetrachloride	ND		ug/Kg	250	07/01/23	07/01/23
1,2-Dichloroethane	ND		ug/Kg	250	07/01/23	07/01/23
Benzene	ND		ug/Kg	250	07/01/23	07/01/23
Trichloroethene	ND		ug/Kg	250	07/01/23	07/01/23
1,2-Dichloropropane	ND		ug/Kg	250	07/01/23	07/01/23
Bromodichloromethane	ND		ug/Kg	250	07/01/23	07/01/23
Dibromomethane	ND		ug/Kg	250	07/01/23	07/01/23
4-Methyl-2-Pentanone	ND		ug/Kg	5,000	07/01/23	07/01/23
cis-1,3-Dichloropropene	ND		ug/Kg	250	07/01/23	07/01/23
Toluene	ND		ug/Kg	250	07/01/23	07/01/23
trans-1,3-Dichloropropene	ND		ug/Kg	250	07/01/23	07/01/23
1,1,2-Trichloroethane	ND		ug/Kg	250	07/01/23	07/01/23
1,3-Dichloropropane	ND		ug/Kg	250	07/01/23	07/01/23
Tetrachloroethene	ND		ug/Kg	250	07/01/23	07/01/23

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Batch QC

QC1077367 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Dibromochloromethane	ND		ug/Kg	250	07/01/23	07/01/23
1,2-Dibromoethane	ND		ug/Kg	250	07/01/23	07/01/23
Chlorobenzene	ND		ug/Kg	250	07/01/23	07/01/23
1,1,1,2-Tetrachloroethane	ND		ug/Kg	250	07/01/23	07/01/23
Ethylbenzene	ND		ug/Kg	250	07/01/23	07/01/23
m,p-Xylenes	ND		ug/Kg	500	07/01/23	07/01/23
o-Xylene	ND		ug/Kg	250	07/01/23	07/01/23
Styrene	ND		ug/Kg	250	07/01/23	07/01/23
Bromoform	ND		ug/Kg	250	07/01/23	07/01/23
Isopropylbenzene	ND		ug/Kg	250	07/01/23	07/01/23
1,1,2,2-Tetrachloroethane	ND		ug/Kg	250	07/01/23	07/01/23
1,2,3-Trichloropropane	ND		ug/Kg	250	07/01/23	07/01/23
Propylbenzene	ND		ug/Kg	250	07/01/23	07/01/23
Bromobenzene	ND		ug/Kg	250	07/01/23	07/01/23
1,3,5-Trimethylbenzene	ND		ug/Kg	250	07/01/23	07/01/23
2-Chlorotoluene	ND		ug/Kg	250	07/01/23	07/01/23
4-Chlorotoluene	ND		ug/Kg	250	07/01/23	07/01/23
tert-Butylbenzene	ND		ug/Kg	250	07/01/23	07/01/23
1,2,4-Trimethylbenzene	ND		ug/Kg	250	07/01/23	07/01/23
sec-Butylbenzene	ND		ug/Kg	250	07/01/23	07/01/23
para-Isopropyl Toluene	ND		ug/Kg	250	07/01/23	07/01/23
1,3-Dichlorobenzene	ND		ug/Kg	250	07/01/23	07/01/23
1,4-Dichlorobenzene	ND		ug/Kg	250	07/01/23	07/01/23
n-Butylbenzene	ND		ug/Kg	250	07/01/23	07/01/23
1,2-Dichlorobenzene	ND		ug/Kg	250	07/01/23	07/01/23
1,2-Dibromo-3-Chloropropane	ND		ug/Kg	250	07/01/23	07/01/23
1,2,4-Trichlorobenzene	ND		ug/Kg	250	07/01/23	07/01/23
Hexachlorobutadiene	ND		ug/Kg	250	07/01/23	07/01/23
Naphthalene	ND		ug/Kg	250	07/01/23	07/01/23
1,2,3-Trichlorobenzene	ND		ug/Kg	250	07/01/23	07/01/23
Xylene (total)	ND		ug/Kg	250	07/01/23	07/01/23
Surrogates				**Limits**		
Dibromofluoromethane	96%		%REC	70-130	07/01/23	07/01/23
1,2-Dichloroethane-d4	103%		%REC	70-145	07/01/23	07/01/23
Toluene-d8	98%		%REC	70-145	07/01/23	07/01/23
Bromofluorobenzene	97%		%REC	70-145	07/01/23	07/01/23

ENTHALPY ANALYTICAL

Batch QC

Type:	**Matrix Spike**	**Lab ID:**	**QC1077374**	**Batch:**	**317395**
Matrix (Source ID):	**Miscell. (487753-001)**	**Method:**	**EPA 8260B**	**Prep Method:**	**EPA 5030B**

QC1077374 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
1,1-Dichloroethene	2,379	ND	2500	ug/Kg	95%		70-141	50
MTBE	2,542	ND	2500	ug/Kg	102%		59-130	50
Benzene	2,414	76.31	2500	ug/Kg	94%		70-130	50
Trichloroethene	2,280	ND	2500	ug/Kg	91%		69-130	50
Toluene	2,431	56.01	2500	ug/Kg	95%		70-130	50
Chlorobenzene	2,325	ND	2500	ug/Kg	93%		70-130	50
Surrogates								
Dibromofluoromethane	2,515		2500	ug/Kg	101%		70-145	50
1,2-Dichloroethane-d4	2,556		2500	ug/Kg	102%		70-145	50
Toluene-d8	2,501		2500	ug/Kg	100%		70-145	50
Bromofluorobenzene	2,644		2500	ug/Kg	106%		70-145	50

Type:	**Matrix Spike Duplicate**	**Lab ID:**	**QC1077375**	**Batch:**	**317395**
Matrix (Source ID):	**Miscell. (487753-001)**	**Method:**	**EPA 8260B**	**Prep Method:**	**EPA 5030B**

QC1077375 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim	DF
1,1-Dichloroethene	2,502	ND	2500	ug/Kg	100%		70-141	5	43	50
MTBE	2,628	ND	2500	ug/Kg	105%		59-130	3	30	50
Benzene	2,503	76.31	2500	ug/Kg	97%		70-130	4	30	50
Trichloroethene	2,418	ND	2500	ug/Kg	97%		69-130	6	30	50
Toluene	2,525	56.01	2500	ug/Kg	99%		70-130	4	30	50
Chlorobenzene	2,458	ND	2500	ug/Kg	98%		70-130	6	30	50
Surrogates										
Dibromofluoromethane	2,485		2500	ug/Kg	99%		70-145			50
1,2-Dichloroethane-d4	2,570		2500	ug/Kg	103%		70-145			50
Toluene-d8	2,489		2500	ug/Kg	100%		70-145			50
Bromofluorobenzene	2,456		2500	ug/Kg	98%		70-145			50

ENTHALPY ANALYTICAL

Batch QC

Type:	Blank	Lab ID:	QC1077035	Batch:	317254
Matrix:	Soil	Method:	EPA 8270C	Prep Method:	EPA 3546

QC1077035 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Carbazole	ND		ug/Kg	250	06/29/23	06/29/23
1-Methylnaphthalene	ND		ug/Kg	250	06/29/23	06/29/23
Pyridine	ND		ug/Kg	250	06/29/23	06/29/23
N-Nitrosodimethylamine	ND		ug/Kg	250	06/29/23	06/29/23
Phenol	ND		ug/Kg	250	06/29/23	06/29/23
Aniline	ND		ug/Kg	250	06/29/23	06/29/23
bis(2-Chloroethyl)ether	ND		ug/Kg	1,200	06/29/23	06/29/23
2-Chlorophenol	ND		ug/Kg	250	06/29/23	06/29/23
1,3-Dichlorobenzene	ND		ug/Kg	250	06/29/23	06/29/23
1,4-Dichlorobenzene	ND		ug/Kg	250	06/29/23	06/29/23
Benzyl alcohol	ND		ug/Kg	250	06/29/23	06/29/23
1,2-Dichlorobenzene	ND		ug/Kg	250	06/29/23	06/29/23
2-Methylphenol	ND		ug/Kg	250	06/29/23	06/29/23
bis(2-Chloroisopropyl) ether	ND		ug/Kg	250	06/29/23	06/29/23
3-,4-Methylphenol	ND		ug/Kg	400	06/29/23	06/29/23
N-Nitroso-di-n-propylamine	ND		ug/Kg	250	06/29/23	06/29/23
Hexachloroethane	ND		ug/Kg	250	06/29/23	06/29/23
Nitrobenzene	ND		ug/Kg	1,200	06/29/23	06/29/23
Isophorone	ND		ug/Kg	250	06/29/23	06/29/23
2-Nitrophenol	ND		ug/Kg	250	06/29/23	06/29/23
2,4-Dimethylphenol	ND		ug/Kg	250	06/29/23	06/29/23
Benzoic acid	ND		ug/Kg	1,200	06/29/23	06/29/23
bis(2-Chloroethoxy)methane	ND		ug/Kg	250	06/29/23	06/29/23
2,4-Dichlorophenol	ND		ug/Kg	250	06/29/23	06/29/23
1,2,4-Trichlorobenzene	ND		ug/Kg	250	06/29/23	06/29/23
Naphthalene	ND		ug/Kg	250	06/29/23	06/29/23
4-Chloroaniline	ND		ug/Kg	250	06/29/23	06/29/23
Hexachlorobutadiene	ND		ug/Kg	250	06/29/23	06/29/23
4-Chloro-3-methylphenol	ND		ug/Kg	250	06/29/23	06/29/23
2-Methylnaphthalene	ND		ug/Kg	250	06/29/23	06/29/23
Hexachlorocyclopentadiene	ND		ug/Kg	1,200	06/29/23	06/29/23
2,4,6-Trichlorophenol	ND		ug/Kg	250	06/29/23	06/29/23
2,4,5-Trichlorophenol	ND		ug/Kg	250	06/29/23	06/29/23
2-Chloronaphthalene	ND		ug/Kg	250	06/29/23	06/29/23
2-Nitroaniline	ND		ug/Kg	250	06/29/23	06/29/23
Dimethylphthalate	ND		ug/Kg	250	06/29/23	06/29/23
Acenaphthylene	ND		ug/Kg	250	06/29/23	06/29/23
2,6-Dinitrotoluene	ND		ug/Kg	250	06/29/23	06/29/23
3-Nitroaniline	ND		ug/Kg	250	06/29/23	06/29/23
Acenaphthene	ND		ug/Kg	250	06/29/23	06/29/23
2,4-Dinitrophenol	ND		ug/Kg	1,200	06/29/23	06/29/23
4-Nitrophenol	ND		ug/Kg	250	06/29/23	06/29/23

ENTHALPY ANALYTICAL

Batch QC

QC1077035 Analyte	Result	Qual	Units	RL	Prepared	Analyzed
Dibenzofuran	ND		ug/Kg	250	06/29/23	06/29/23
2,4-Dinitrotoluene	ND		ug/Kg	250	06/29/23	06/29/23
Diethylphthalate	ND		ug/Kg	250	06/29/23	06/29/23
Fluorene	ND		ug/Kg	250	06/29/23	06/29/23
4-Chlorophenyl-phenylether	ND		ug/Kg	250	06/29/23	06/29/23
4-Nitroaniline	ND		ug/Kg	250	06/29/23	06/29/23
4,6-Dinitro-2-methylphenol	ND		ug/Kg	250	06/29/23	06/29/23
N-Nitrosodiphenylamine	ND		ug/Kg	250	06/29/23	06/29/23
1,2-diphenylhydrazine (as azobenzene)	ND		ug/Kg	250	06/29/23	06/29/23
4-Bromophenyl-phenylether	ND		ug/Kg	250	06/29/23	06/29/23
Hexachlorobenzene	ND		ug/Kg	250	06/29/23	06/29/23
Pentachlorophenol	ND		ug/Kg	1,200	06/29/23	06/29/23
Phenanthrene	ND		ug/Kg	250	06/29/23	06/29/23
Anthracene	ND		ug/Kg	250	06/29/23	06/29/23
Di-n-butylphthalate	ND		ug/Kg	250	06/29/23	06/29/23
Fluoranthene	ND		ug/Kg	250	06/29/23	06/29/23
Benzidine	ND		ug/Kg	1,200	06/29/23	06/29/23
Pyrene	ND		ug/Kg	250	06/29/23	06/29/23
Butylbenzylphthalate	ND		ug/Kg	250	06/29/23	06/29/23
3,3'-Dichlorobenzidine	ND		ug/Kg	1,200	06/29/23	06/29/23
Benzo(a)anthracene	ND		ug/Kg	250	06/29/23	06/29/23
Chrysene	ND		ug/Kg	250	06/29/23	06/29/23
bis(2-Ethylhexyl)phthalate	ND		ug/Kg	250	06/29/23	06/29/23
Di-n-octylphthalate	ND		ug/Kg	250	06/29/23	06/29/23
Benzo(b)fluoranthene	ND		ug/Kg	250	06/29/23	06/29/23
Benzo(k)fluoranthene	ND		ug/Kg	250	06/29/23	06/29/23
Benzo(a)pyrene	ND		ug/Kg	250	06/29/23	06/29/23
Indeno(1,2,3-cd)pyrene	ND		ug/Kg	250	06/29/23	06/29/23
Dibenz(a,h)anthracene	ND		ug/Kg	250	06/29/23	06/29/23
Benzo(g,h,i)perylene	ND		ug/Kg	250	06/29/23	06/29/23
Surrogates				**Limits**		
2-Fluorophenol	92%		%REC	29-120	06/29/23	06/29/23
Phenol-d6	94%		%REC	30-120	06/29/23	06/29/23
2,4,6-Tribromophenol	76%		%REC	32-120	06/29/23	06/29/23
Nitrobenzene-d5	88%		%REC	33-120	06/29/23	06/29/23
2-Fluorobiphenyl	87%		%REC	39-120	06/29/23	06/29/23
Terphenyl-d14	92%		%REC	44-125	06/29/23	06/29/23

Batch QC

Type:	Lab Control Sample	Lab ID:	QC1077036	Batch:	317254
Matrix:	Soil	Method:	EPA 8270C	Prep Method:	EPA 3546

QC1077036 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
Phenol	4,467	3750	ug/Kg	119%		42-120
2-Chlorophenol	4,005	3750	ug/Kg	107%		41-120
1,4-Dichlorobenzene	4,009	3750	ug/Kg	107%		36-120
3-,4-Methylphenol	4,265	3750	ug/Kg	114%		42-120
N-Nitroso-di-n-propylamine	4,024	3750	ug/Kg	107%		43-121
2,4-Dimethylphenol	3,873	3750	ug/Kg	103%		25-120
1,2,4-Trichlorobenzene	3,830	3750	ug/Kg	102%		38-120
4-Chloro-3-methylphenol	4,153	3750	ug/Kg	111%		40-125
2,4,5-Trichlorophenol	4,073	3750	ug/Kg	109%		40-124
Acenaphthene	4,016	3750	ug/Kg	107%		35-126
4-Nitrophenol	3,468	3750	ug/Kg	92%		24-128
2,4-Dinitrotoluene	4,320	3750	ug/Kg	115%		40-131
Pentachlorophenol	2,940	3750	ug/Kg	78%		35-120
Pyrene	4,151	3750	ug/Kg	111%		37-135
Chrysene	3,821	3750	ug/Kg	102%		38-132
Benzo(b)fluoranthene	4,277	3750	ug/Kg	114%		38-135
Surrogates						
2-Fluorophenol	2,047	2000	ug/Kg	102%		29-120
Phenol-d6	2,159	2000	ug/Kg	108%		30-120
2,4,6-Tribromophenol	1,992	2000	ug/Kg	100%		32-120
Nitrobenzene-d5	2,001	2000	ug/Kg	100%		33-120
2-Fluorobiphenyl	1,922	2000	ug/Kg	96%		39-120
Terphenyl-d14	2,024	2000	ug/Kg	101%		44-125

Batch QC

Type:	Matrix Spike	Lab ID:	QC1077037	Batch:	317254
Matrix (Source ID):	Soil (487562-001)	Method:	EPA 8270C	Prep Method:	EPA 3546

QC1077037 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	DF
Phenol	3,701	ND	3750	ug/Kg	99%		37-120	5
2-Chlorophenol	3,625	ND	3750	ug/Kg	97%		33-120	5
1,4-Dichlorobenzene	3,930	ND	3750	ug/Kg	105%		32-120	5
3-,4-Methylphenol	3,224	ND	3750	ug/Kg	86%		37-120	5
N-Nitroso-di-n-propylamine	3,915	ND	3750	ug/Kg	104%		32-120	5
2,4-Dimethylphenol	1,738	ND	3750	ug/Kg	46%		32-120	5
1,2,4-Trichlorobenzene	3,859	ND	3750	ug/Kg	103%		33-120	5
4-Chloro-3-methylphenol	2,826	ND	3750	ug/Kg	75%		41-121	5
2,4,5-Trichlorophenol	3,007	ND	3750	ug/Kg	80%		40-120	5
Acenaphthene	3,432	ND	3750	ug/Kg	92%		37-120	5
4-Nitrophenol	2,716	ND	3750	ug/Kg	72%		20-141	5
2,4-Dinitrotoluene	3,073	ND	3750	ug/Kg	82%		33-128	5
Pentachlorophenol	3,429	ND	3750	ug/Kg		DO	28-132	5
Pyrene	3,326	ND	3750	ug/Kg	89%		39-135	5
Chrysene	3,242	ND	3750	ug/Kg	86%		37-135	5
Benzo(b)fluoranthene	3,388	ND	3750	ug/Kg	90%		34-139	5
Surrogates								
2-Fluorophenol	1,669		2000	ug/Kg	83%		29-120	5
Phenol-d6	1,770		2000	ug/Kg	89%		30-120	5
2,4,6-Tribromophenol	1,303		2000	ug/Kg	65%		32-120	5
Nitrobenzene-d5	1,929		2000	ug/Kg	96%		33-120	5
2-Fluorobiphenyl	1,586		2000	ug/Kg	79%		39-120	5
Terphenyl-d14	1,571		2000	ug/Kg	79%		44-125	5

ENTHALPY ANALYTICAL

Batch QC

Type:	Matrix Spike Duplicate	Lab ID:	QC1077038	Batch:	317254
Matrix (Source ID):	Soil (487562-001)	Method:	EPA 8270C	Prep Method:	EPA 3546

QC1077038 Analyte	Result	Source Sample Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim	DF
Phenol	3,833	ND	3713	ug/Kg	103%		37-120	4	49	5
2-Chlorophenol	3,711	ND	3713	ug/Kg	100%		33-120	3	52	5
1,4-Dichlorobenzene	3,940	ND	3713	ug/Kg	106%		32-120	1	50	5
3-,4-Methylphenol	3,380	ND	3713	ug/Kg	91%		37-120	6	54	5
N-Nitroso-di-n-propylamine	4,114	ND	3713	ug/Kg	111%		32-120	6	50	5
2,4-Dimethylphenol	1,910	ND	3713	ug/Kg	51%		32-120	10	50	5
1,2,4-Trichlorobenzene	3,945	ND	3713	ug/Kg	106%		33-120	3	50	5
4-Chloro-3-methylphenol	2,808	ND	3713	ug/Kg	76%		41-121	0	43	5
2,4,5-Trichlorophenol	3,035	ND	3713	ug/Kg	82%		40-120	2	47	5
Acenaphthene	3,322	ND	3713	ug/Kg	89%		37-120	2	48	5
4-Nitrophenol	2,760	ND	3713	ug/Kg	74%		20-141	3	30	5
2,4-Dinitrotoluene	3,087	ND	3713	ug/Kg	83%		33-128	1	50	5
Pentachlorophenol	3,425	ND	3713	ug/Kg		DO	28-132		30	5
Pyrene	3,252	ND	3713	ug/Kg	88%		39-135	1	41	5
Chrysene	3,121	ND	3713	ug/Kg	84%		37-135	3	46	5
Benzo(b)fluoranthene	3,421	ND	3713	ug/Kg	92%		34-139	2	47	5
Surrogates										
2-Fluorophenol	1,689		1980	ug/Kg	85%		29-120			5
Phenol-d6	1,814		1980	ug/Kg	92%		30-120			5
2,4,6-Tribromophenol	1,256		1980	ug/Kg	63%		32-120			5
Nitrobenzene-d5	2,002		1980	ug/Kg	101%		33-120			5
2-Fluorobiphenyl	1,557		1980	ug/Kg	79%		39-120			5
Terphenyl-d14	1,498		1980	ug/Kg	76%		44-125			5

CCV drift outside limits; average CCV drift within limits per method requirements
* Value is outside QC limits
DO Diluted Out
ND Not Detected

Laboratory Job Number 487562

Subcontracted Products

American Environmental Testing

AMERICAN ENVIRONMENTAL TESTING LABORATORY
2840 North Naomi Street Burbank, CA 91504 • ELAP# 1541 & 2402 • LACSD# 10181
TEL (888) 288-AETL • (818) 845-8200 • www.aetlab.com
A KYZER LABS COMPANY

July 06, 2023

AETL Job No: BEF0261
Received Date: 06/28/2023
Project Number: EO-487562

Enthalpy Analytical
931 W. Barkley Ave.
Orange, CA 92868

Telephone: (714) 771-9930

Attention: Patty Mata

Project Name: EO-487562

Site:

Enclosed please find the results of analyses for samples which were analyzed as specified on the attached chain of custody. If you have any questions concerning this report, please do not hesitate to call.

Checked By:

Corey Jones
Project Manager

Approved By:

Hailley Coleman
Project Manager

Table of Contents

Client Project Name: OPP & Herbicide Project Number: EO-487562
Work Order Number: BEF0261

AMERICAN ENVIRONMENTAL TESTING LABORATORY
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Enthalpy Analytical	AETL Job Number:	BEF0261		
931 W. Barkley Ave.	Project Number:	EO-487562		
Orange, CA 92868	Attention:	Patty Mata		
	Project Name:	EO-487562	Reported:	07/06/2023 13:38

Sample Condition on Receipt

Cooler ID: Default Cooler **Temperature: 5.8 °C**

Are the COCs Correct	Y		
Labels Legible	Y	Containers In Good Condition	Y
COC/Labels Agree	Y	Samples Preserved Properly	Y
Sufficient Sample Volume	Y	Sufficient Holding Time for all Tests	Y
Sample Labels intact	Y	Received on Ice	Y

ENTHALPY ANALYTICAL

Enthalpy Analytical - Orange
Orange, CA 92868
(714) 771-6900 / Fax: (510) 486-0532

Subcontract Laboratory:
American Environmental Testing
2834 North Naomi Street
Burbank, CA 91504-2023
ATTN: Hailley Coleman
PO #: Required, to be sent via email

Enthalpy Order: EO-487562
PM: Patty Mata
Email: patty.mata@enthalpy.com
CC: incomingreports@enthalpy.com
Phone: (714) 771-6900

Results Due: Standard TAT
Report Level: II
Report To: RL
EDDs: Standard Excel Transfer File (3 tab xls: SAMPDATE, QCDATA, LNOTE)

Notes:

BGF0261

BGF-0261

	Sample ID	Collected	Lab ID	# Cont.	Matrix	Analysis Requested	Comment
01	TAILING A	27-JUN-2023 09:05	487562-001	1	Soil	Organophosphorus Pesticides	
				1	Soil	EPA 8151A Chlorinated Herbicides	
02	TAILING B	27-JUN-2023 09:41	487562-002	1	Soil	Organophosphorus Pesticides	
				1	Soil	EPA 8151A Chlorinated Herbicides	
03	TAILING C	27-JUN-2023 10:08	487562-003	1	Soil	Organophosphorus Pesticides	
				1	Soil	EPA 8151A Chlorinated Herbicides	
04	COMPOSITE	27-JUN-2023 10:06	487562-004	1	Soil	Organophosphorus Pesticides	
				1	Soil	EPA 8151A Chlorinated Herbicides	

Notes:	Relinquished By:	Received By:
	Amina Hart	AET Cordale Coreha Careyes
	Date: 6-27-23	Date: 6/28/23 (OLS)
	Date:	Date:
	Date:	Date:

800-322-5555
www.gls-us.com

GLS.

CPS

Tracking #: 559651494

Ship From
ENTHALPY ANALYTICAL
BERKELEY SERVICE CENTER
2323 5TH STREET
BERKELEY, CA 94710

BURBANK

Ship To
AMERICAN ENVIRONMENTAL TESTING
HAILLEY COLEMAN
2834 NORTH NAOMI STREET
BURBANK, CA 91504

S02112F

COD: $0.00
Weight: 0 lb(s)
Reference:

Delivery Instructions:

88791871

Signature Type: STANDARD

BUR CA913-BF1

Print Date: 6/26/2023 9:53 AM

Package 1 of 2

LABEL INSTRUCTIONS:

Do not copy or reprint this label for additional shipments - each package must have a unique barcode.
Step 1: Use the "Print Label" button on this page to print the shipping label on a laser or inkjet printer.
Step 2: Fold this page in half.
Step 3: Securely attach this label to your package and do not cover the barcode.

TERMS AND CONDITIONS:

By giving us your shipment to deliver, you agree to all of the General Logistics Systems US, Inc. (GLS) service terms & conditions including, but not limited to; limits of liability, declared value conditions, and claim procedures which are available on our website at www.gls-us.com.

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COOLER RECEIPT FORM

Client Name: ENTHALPY

Project Name: SVOC Testing Project No.: EO-487562

AETL Job Number: BEF0261

Date Received: 06/28/2023 Received by: Greta G

Carrier: ☐ AETL Courier ☐ Client ☑ GSL ☐ FedEx ☐ UPS
☐Others:

Samples were received in: ☑ Cooler (1) ☐ Other (Specify):

Sample Container Temperature: 5.8 °C IR Gun S/N: 51941911MV

Type of sample containers: VOA, Glass bottles, ✔Wide mouth jars, HDPE bottles, Metal sleeves, Acetate sleeves, 5035 Kit: AETL or Client, Tedlar Bags,
Summa Canister: 6L, 3L, 1L, Others (Specify): ______

How are samples preserved: ☐ None, ☑ Ice, ☐ Blue Ice, ☐ Dry Ice
☑ None, ☐ HNO_3, ☐ NaOH, ☐ ZnOAc, ☐ HCl, ☐ $Na_2S_2O_3$, ☐ MeOH, ☐ $NaHSO_4$
☐ Other (Specify):

	Yes	No	N/A	Note or Comment
1. Are the COCs Correct?	✔			
2. Are Sample labels legible & indelible ink?	✔			
3. Do samples match the COC?	✔			
4. Are the required analyses clear?	✔			
5. Is there enough samples for required analysis?	✔			
6. Does cooler or samples have custody seal(s)?			✔	
7. Are sample containers in good condition?	✔			
8. Are samples preserved?	✔			
9. Are samples preserved properly for the intended analysis?	✔			
10. Are the VOAs free of headspace? See footnote.			✔	
11. Are the jars free of headspace?			✔	

* = see note below. N/A = Not Applicable

PLEASE NOTE ALL SAMPLES WILL BE DISPOSED OF 30 DAYS AFTER RECEIVING DATE. IF AETL IS INFORMED OTHERWISE, THERE WILL BE A STORAGE CHARGE PER SAMPLE PER MONTH FOR ANY SAMPLE HELD BEYOND 30 DAYS.

◯ Example maximum headspace bubble size; acceptance criteria not to exceed 5-6 mm in diameter.

For headspace bubbles exceeding 6 mm in diameter, sample receiving will tag the VOA and notify the Project Manager. The Project Manager will contact client for Analyze or Resample instructions.

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Enthalpy Analytical	AETL Job Number:	BEF0261		
931 W. Barkley Ave.	Project Number:	EO-487562		
Orange, CA 92868	Attention:	Patty Mata		
	Project Name:	EO-487562	Reported:	07/06/2023 13:38

Case Narrative

The following "Sample Received" Section summarizes the samples received and associated analyses requested as specified on the enclosed chain of custody.

Results as reported by the laboratory apply only to 1) the items tested, 2) as the samples are received, and 3) the accuracy of information provided. Information supplied by the customer that may affect validity of results and may be contained in this report include Project Name/Number, Site Location, Sample Locations, Sampling Dates/Times, Sample ID, Sample Preservation, Sample Matrix, Sample Properties, Field Blanks, Field Duplicates, Field Spikes, and Site Historical Data.

Accreditation applies only to the test methods listed on each scope of accreditation held by the laboratory; certifications held by the laboratory may not apply to results supplied in this report.

Unless otherwise noted, all results of soil and solid samples are based on wet weight.

Qualifiers are noted in the report.

Enthalpy Analytical	AETL Job Number:	BEF0261		
931 W. Barkley Ave.	Project Number:	EO-487562		
Orange, CA 92868	Attention:	Patty Mata		
	Project Name:	EO-487562	Reported:	07/06/2023 13:38

Samples Received

AETL received the following samples on 06/28/2023 with the following specifications

Client ID		Sample Date
TAILING A/487562-001		**06/27/2023 9:05**
Lab ID	**Matrix**	**Quantity of Containers**
BEF0261-01	**Soil**	**2**
Analysis	**Units**	**TAT**
EPA 8141A	mg/kg	5
EPA 8151A	mg/kg	5

Client ID		Sample Date
TAILING B/487562-002		**06/27/2023 9:41**
Lab ID	**Matrix**	**Quantity of Containers**
BEF0261-02	**Soil**	**2**
Analysis	**Units**	**TAT**
EPA 8141A	mg/kg	5
EPA 8151A	mg/kg	5

Client ID		Sample Date
TAILING C/487562-003		**06/27/2023 10:08**
Lab ID	**Matrix**	**Quantity of Containers**
BEF0261-03	**Soil**	**2**
Analysis	**Units**	**TAT**
EPA 8141A	mg/kg	5
EPA 8151A	mg/kg	5

Enthalpy Analytical	AETL Job Number:	BEF0261		
931 W. Barkley Ave.	Project Number:	EO-487562		
Orange, CA 92868	Attention:	Patty Mata		
	Project Name:	EO-487562	Reported:	07/06/2023 13:38

Samples Received
(Continued)

AETL received the following samples on 06/28/2023 with the following specifications

Client ID		Sample Date
COMPOSITE/487562-004		**06/27/2023 10:06**
Lab ID	**Matrix**	**Quantity of Containers**
BEF0261-04	**Soil**	**2**

Analysis	Units	TAT
EPA 8141A	mg/kg	5
EPA 8151A	mg/kg	5

Total Number of Samples received: 4

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Enthalpy Analytical	AETL Job Number:	BEF0261			
931 W. Barkley Ave.	Project Number:	EO-487562			
Orange, CA 92868	Attention:	Patty Mata			
	Project Name:	EO-487562		Reported:	07/06/2023 13:38

Positive Hits Summary

Lab ID	**Client ID**				**Sampled**
Method	Analyte	Result	Qualifier	Unit	Analyzed

No positive results reported

Enthalpy Analytical	AETL Job Number:	BEF0261	
931 W. Barkley Ave.	Project Number:	EO-487562	
Orange, CA 92868	Attention:	Patty Mata	
	Project Name:	EO-487562	Reported: 07/06/2023 13:38

Analytical Results

Client ID: TAILING A/487562-001

Lab ID: BEF0261-01 (Soil) **Sampled: 06/27/23 9:05**

Analyte	Result	Qualifier	Dilution	RL	Units	Prepared Date/Time	Analyzed Date/Time	Batch	Analyst Initials	Prep. Method
Organophosphorus Pesticides										
Method: EPA 8141A										
Azinphos-methyl	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Bolstar (Sulprofos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Chloropyrifos (Dursban)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Coumaphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Demeton-O & S	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Diazinon	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Dichlorvos (DDVP, Diclorovos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Disulfoton	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Ethoprop	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Fensulfothion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Fenthion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Malathion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Merphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Methyl parathion (Parathion methyl)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Mevinphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Naled	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Phorate (Phosphorodithioic acid)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Ronnel	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Tetrachlorvinphos (Stirophos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Tokuthion (Prothiofos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
Trichloronate	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 18:37	B3G0019	ATS	3541
	Recovery			Acceptance Criteria						
Surrogate: Tributylphosphate	*111%*			*50-150*		07/03/23 14:29	*07/05/23 18:37*	B3G0019	*ATS*	3541
Chlorinated Herbicides										
Method: EPA 8151A										
Acifluorfen	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
Bentazon	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
Chloramben	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
2,4-D	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
2,4-DB	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
DCPA diacid	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B

Enthalpy Analytical	AETL Job Number:	BEF0261	
931 W. Barkley Ave.	Project Number:	EO-487562	
Orange, CA 92868	Attention:	Patty Mata	
	Project Name:	EO-487562	Reported: 07/06/2023 13:38

Analytical Results

Client ID: TAILING A/487562-001

Lab ID: BEF0261-01 (Soil) **Sampled: 06/27/23 9:05**

Analyte	Result	Qualifier	Dilution	RL	Units	Prepared Date/Time	Analyzed Date/Time	Batch	Analyst Initials	Prep. Method
Chlorinated Herbicides (Continued)										
Dalapon	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
Dicamba	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
3,5-Dichlorobenzoic acid	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
Dichloroprop	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
Dinoseb	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
MCPA	ND		1	0.250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
MCPP	ND		1	0.250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
4-Nitrophenol	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
Pentachlorophenol (PCP)	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
Picloram	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
2,4,5-TP	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 17:25	B3G0007	KF	3550B
	Recovery			Acceptance Criteria						
Surrogate: DCAA	*58.4%*			*30-140*		07/03/23 08:42	*07/03/23 17:25*	B3G0007	*KF*	3550B

Enthalpy Analytical	AETL Job Number:	BEF0261	
931 W. Barkley Ave.	Project Number:	EO-487562	
Orange, CA 92868	Attention:	Patty Mata	
	Project Name:	EO-487562	Reported: 07/06/2023 13:38

Analytical Results

Client ID: TAILING B/487562-002

Lab ID: BEF0261-02 (Soil) **Sampled: 06/27/23 9:41**

Analyte	Result	Qualifier	Dilution	RL	Units	Prepared Date/Time	Analyzed Date/Time	Batch	Analyst Initials	Prep. Method
Organophosphorus Pesticides										
Method: EPA 8141A										
Azinphos-methyl	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Bolstar (Sulprofos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Chloropyrifos (Dursban)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Coumaphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Demeton-O & S	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Diazinon	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Dichlorvos (DDVP, Diclorovos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Disulfoton	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Ethoprop	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Fensulfothion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Fenthion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Malathion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Merphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Methyl parathion (Parathion methyl)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Mevinphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Naled	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Phorate (Phosphorodithioic acid)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Ronnel	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Tetrachlorvinphos (Stirophos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Tokuthion (Prothiofos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
Trichloronate	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:11	B3G0019	ATS	3541
	Recovery			Acceptance Criteria						
Surrogate: Tributylphosphate	*83.1%*			*50-150*		07/03/23 14:29	*07/05/23 19:11*	B3G0019	*ATS*	3541
Chlorinated Herbicides										
Method: EPA 8151A										
Acifluorfen	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
Bentazon	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
Chloramben	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
2,4-D	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
2,4-DB	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
DCPA diacid	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B

Enthalpy Analytical	AETL Job Number:	BEF0261	
931 W. Barkley Ave.	Project Number:	EO-487562	
Orange, CA 92868	Attention:	Patty Mata	
	Project Name:	EO-487562	Reported: 07/06/2023 13:38

Analytical Results

Client ID: TAILING B/487562-002

Lab ID: BEF0261-02 (Soil) **Sampled: 06/27/23 9:41**

Analyte	Result	Qualifier	Dilution	RL	Units	Prepared Date/Time	Analyzed Date/Time	Batch	Analyst Initials	Prep. Method
Chlorinated Herbicides (Continued)										
Dalapon	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
Dicamba	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
3,5-Dichlorobenzoic acid	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
Dichloroprop	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
Dinoseb	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
MCPA	ND		1	0.250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
MCPP	ND		1	0.250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
4-Nitrophenol	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
Pentachlorophenol (PCP)	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
Picloram	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
2,4,5-TP	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:23	B3G0007	KF	3550B
	Recovery			Acceptance Criteria						
Surrogate: DCAA	*47.3%*			*30-140*		07/03/23 08:42	*07/03/23 18:23*	B3G0007	*KF*	3550B

Enthalpy Analytical	AETL Job Number:	BEF0261		
931 W. Barkley Ave.	Project Number:	EO-487562		
Orange, CA 92868	Attention:	Patty Mata		
	Project Name:	EO-487562	Reported:	07/06/2023 13:38

Analytical Results

Client ID: TAILING C/487562-003

Lab ID: BEF0261-03 (Soil) **Sampled: 06/27/23 10:08**

Analyte	Result	Qualifier	Dilution	RL	Units	Prepared Date/Time	Analyzed Date/Time	Batch	Analyst Initials	Prep. Method
Organophosphorus Pesticides										
Method: EPA 8141A										
Azinphos-methyl	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Bolstar (Sulprofos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Chloropyrifos (Dursban)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Coumaphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Demeton-O & S	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Diazinon	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Dichlorvos (DDVP, Diclorovos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Disulfoton	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Ethoprop	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Fensulfothion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Fenthion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Malathion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Merphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Methyl parathion (Parathion methyl)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Mevinphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Naled	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Phorate (Phosphorodithioic acid)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Ronnel	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Tetrachlorvinphos (Stirophos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Tokuthion (Prothiofos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
Trichloronate	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 19:44	B3G0019	ATS	3541
	Recovery			Acceptance Criteria						
Surrogate: Tributylphosphate	*119%*			*50-150*		07/03/23 14:29	*07/05/23 19:44*	B3G0019	*ATS*	3541
Chlorinated Herbicides										
Method: EPA 8151A										
Acifluorfen	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
Bentazon	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
Chloramben	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
2,4-D	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
2,4-DB	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
DCPA diacid	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B

Enthalpy Analytical	AETL Job Number:	BEF0261	
931 W. Barkley Ave.	Project Number:	EO-487562	
Orange, CA 92868	Attention:	Patty Mata	
	Project Name:	EO-487562	Reported: 07/06/2023 13:38

Analytical Results

Client ID: TAILING C/487562-003

Lab ID: BEF0261-03 (Soil) **Sampled: 06/27/23 10:08**

Analyte	Result	Qualifier	Dilution	RL	Units	Prepared Date/Time	Analyzed Date/Time	Batch	Analyst Initials	Prep. Method
Chlorinated Herbicides (Continued)										
Dalapon	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
Dicamba	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
3,5-Dichlorobenzoic acid	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
Dichloroprop	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
Dinoseb	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
MCPA	ND		1	0.250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
MCPP	ND		1	0.250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
4-Nitrophenol	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
Pentachlorophenol (PCP)	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
Picloram	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
2,4,5-TP	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 18:53	B3G0007	KF	3550B
	Recovery			Acceptance Criteria						
Surrogate: DCAA	*73.6%*			*30-140*		07/03/23 08:42	*07/03/23 18:53*	B3G0007	*KF*	3550B

Enthalpy Analytical	AETL Job Number:	BEF0261	
931 W. Barkley Ave.	Project Number:	EO-487562	
Orange, CA 92868	Attention:	Patty Mata	
	Project Name:	EO-487562	Reported: 07/06/2023 13:38

Analytical Results

Client ID: COMPOSITE/487562-004

Lab ID: BEF0261-04 (Soil) **Sampled: 06/27/23 10:06**

Analyte	Result	Qualifier	Dilution	RL	Units	Prepared Date/Time	Analyzed Date/Time	Batch	Analyst Initials	Prep. Method
Organophosphorus Pesticides										
Method: EPA 8141A										
Azinphos-methyl	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Bolstar (Sulprofos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Chloropyrifos (Dursban)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Coumaphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Demeton-O & S	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Diazinon	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Dichlorvos (DDVP, Diclorovos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Disulfoton	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Ethoprop	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Fensulfothion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Fenthion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Malathion	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Merphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Methyl parathion (Parathion methyl)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Mevinphos	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Naled	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Phorate (Phosphorodithioic acid)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Ronnel	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Tetrachlorvinphos (Stirophos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Tokuthion (Prothiofos)	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
Trichloronate	ND		1	0.0200	mg/kg	07/03/23 14:29	07/05/23 20:18	B3G0019	ATS	3541
	Recovery			Acceptance Criteria						
Surrogate: Tributylphosphate	*42.0% S6*			*50-150*		07/03/23 14:29	*07/05/23 20:18*	B3G0019	*ATS*	3541
Chlorinated Herbicides										
Method: EPA 8151A										
Acifluorfen	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
Bentazon	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
Chloramben	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
2,4-D	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
2,4-DB	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
DCPA diacid	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B

Enthalpy Analytical	AETL Job Number:	BEF0261		
931 W. Barkley Ave.	Project Number:	EO-487562		
Orange, CA 92868	Attention:	Patty Mata		
	Project Name:	EO-487562	Reported:	07/06/2023 13:38

Analytical Results

Client ID: COMPOSITE/487562-004

Lab ID: BEF0261-04 (Soil) **Sampled: 06/27/23 10:06**

Analyte	Result	Qualifier	Dilution	RL	Units	Prepared Date/Time	Analyzed Date/Time	Batch	Analyst Initials	Prep. Method
Chlorinated Herbicides (Continued)										
Dalapon	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
Dicamba	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
3,5-Dichlorobenzoic acid	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
Dichloroprop	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
Dinoseb	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
MCPA	ND		1	0.250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
MCPP	ND		1	0.250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
4-Nitrophenol	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
Pentachlorophenol (PCP)	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
Picloram	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
2,4,5-TP	ND		1	0.00250	mg/kg	07/03/23 08:42	07/03/23 19:22	B3G0007	KF	3550B
	Recovery			Acceptance Criteria						
Surrogate: DCAA	*53.8%*			*30-140*		07/03/23 08:42	*07/03/23 19:22*	B3G0007	*KF*	3550B

Enthalpy Analytical	AETL Job Number:	BEF0261			
931 W. Barkley Ave.	Project Number:	EO-487562			
Orange, CA 92868	Attention:	Patty Mata			
	Project Name:	EO-487562	Reported:	07/06/2023 13:38	

Quality Control Results

Organophosphorus Pesticides (EPA 8141A)

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: B3G0019 - 3541				**Prepared:**	**07/03/2023 14:29**					
Method Blank (B3G0019-BLK1)				**Analyzed:**	**07/03/2023 17:00**					
Azinphos-methyl	ND	0.0200	mg/kg							
Bolstar (Sulprofos)	ND	0.0200	mg/kg							
Chloropyrifos (Dursban)	ND	0.0200	mg/kg							
Coumaphos	ND	0.0200	mg/kg							
Demeton-O & S	ND	0.0200	mg/kg							
Diazinon	ND	0.0200	mg/kg							
Dichlorvos (DDVP, Diclorovos)	ND	0.0200	mg/kg							
Disulfoton	ND	0.0200	mg/kg							
Ethoprop	ND	0.0200	mg/kg							
Fensulfothion	ND	0.0200	mg/kg							
Fenthion	ND	0.0200	mg/kg							
Malathion	ND	0.0200	mg/kg							
Merphos	ND	0.0200	mg/kg							
Methyl parathion (Parathion methyl)	ND	0.0200	mg/kg							
Mevinphos	ND	0.0200	mg/kg							
Naled	ND	0.0200	mg/kg							
Phorate (Phosphorodithioic acid)	ND	0.0200	mg/kg							
Ronnel	ND	0.0200	mg/kg							
Tetrachlorvinphos (Stirophos)	ND	0.0200	mg/kg							
Tokuthion (Prothiofos)	ND	0.0200	mg/kg							
Trichloronate	ND	0.0200	mg/kg							
Surrogate: Tributylphosphate	*0.164*		*mg/kg*	*0.167*		*98.4*	*50-150*			

Enthalpy Analytical	AETL Job Number:	BEF0261			
931 W. Barkley Ave.	Project Number:	EO-487562			
Orange, CA 92868	Attention:	Patty Mata			
	Project Name:	EO-487562		Reported:	07/06/2023 13:38

Quality Control Results

Organophosphorus Pesticides (EPA 8141A)

Batch: B3G0019 - 3541 (Continued) — **Prepared: 07/03/2023 14:29**

LCS (B3G0019-BS1) — **Analyzed: 07/03/2023 15:54**

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Azinphos-methyl	0.0589	0.0200	mg/kg	0.133		44.2	30-150			
Bolstar (Sulprofos)	0.101	0.0200	mg/kg	0.133		75.9	30-150			
Chloropyrifos (Dursban)	0.107	0.0200	mg/kg	0.133		80.3	30-150			
Coumaphos	0.0719	0.0200	mg/kg	0.133		53.9	30-150			
Demeton-O & S	0.0595	0.0200	mg/kg	0.133		44.6	20-150			
Diazinon	0.105	0.0200	mg/kg	0.133		78.9	30-150			
Dichlorvos (DDVP, Diclorovos)	0.0847	0.0200	mg/kg	0.133		63.5	30-150			
Disulfoton	0.110	0.0200	mg/kg	0.133		82.4	30-150			
Ethoprop	0.101	0.0200	mg/kg	0.133		76.1	30-150			
Fensulfothion	0.0532	0.0200	mg/kg	0.133		39.9	30-150			
Fenthion	0.106	0.0200	mg/kg	0.133		79.3	30-150			
Malathion	0.0927	0.0200	mg/kg	0.133		69.5	30-150			
Merphos	0.0619	0.0200	mg/kg	0.133		46.4	30-150			
Methyl parathion (Parathion methyl)	0.116	0.0200	mg/kg	0.133		87.4	30-150			
Mevinphos	0.0718	0.0200	mg/kg	0.133		53.8	30-150			
Naled	0.0549	0.0200	mg/kg	0.133		41.2	30-150			
Phorate (Phosphorodithioic acid)	0.103	0.0200	mg/kg	0.133		77.5	30-150			
Ronnel	0.0694	0.0200	mg/kg	0.133		52.0	30-150			
Tetrachlorvinphos (Stirophos)	0.0794	0.0200	mg/kg	0.133		59.6	30-150			
Tokuthion (Prothiofos)	0.109	0.0200	mg/kg	0.133		81.9	30-150			
Trichloronate	0.114	0.0200	mg/kg	0.133		85.3	30-150			
Surrogate: Tributylphosphate	*0.190*		*mg/kg*	*0.167*		*114*	*50-150*			

LCSD (B3G0019-BSD1) — **Analyzed: 07/03/2023 16:27**

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Azinphos-methyl	0.0755	0.0200	mg/kg	0.133		56.6	30-150	24.8	40	
Bolstar (Sulprofos)	0.119	0.0200	mg/kg	0.133		89.2	30-150	16.1	40	
Chloropyrifos (Dursban)	0.133	0.0200	mg/kg	0.133		99.5	30-150	21.3	40	
Coumaphos	0.0849	0.0200	mg/kg	0.133		63.7	30-150	16.6	40	
Demeton-O & S	0.0571	0.0200	mg/kg	0.133		42.8	20-150	4.03	40	
Diazinon	0.135	0.0200	mg/kg	0.133		101	30-150	24.9	40	
Dichlorvos (DDVP, Diclorovos)	0.103	0.0200	mg/kg	0.133		76.9	30-150	19.1	40	
Disulfoton	0.146	0.0200	mg/kg	0.133		109	30-150	28.1	40	
Ethoprop	0.119	0.0200	mg/kg	0.133		89.1	30-150	15.8	40	
Fensulfothion	0.0724	0.0200	mg/kg	0.133		54.3	30-150	30.5	40	
Fenthion	0.130	0.0200	mg/kg	0.133		97.6	30-150	20.6	40	
Malathion	0.114	0.0200	mg/kg	0.133		85.5	30-150	20.7	40	
Merphos	0.0833	0.0200	mg/kg	0.133		62.4	30-150	29.5	40	
Methyl parathion (Parathion methyl)	0.143	0.0200	mg/kg	0.133		107	30-150	20.5	40	
Mevinphos	0.0888	0.0200	mg/kg	0.133		66.6	30-150	21.2	40	
Naled	0.0633	0.0200	mg/kg	0.133		47.5	30-150	14.3	40	
Phorate (Phosphorodithioic acid)	0.129	0.0200	mg/kg	0.133		96.9	30-150	22.2	40	

Enthalpy Analytical	AETL Job Number:	BEF0261			
931 W. Barkley Ave.	Project Number:	EO-487562			
Orange, CA 92868	Attention:	Patty Mata			
	Project Name:	EO-487562		Reported:	07/06/2023 13:38

Quality Control Results

Organophosphorus Pesticides (EPA 8141A)

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: B3G0019 - 3541 (Continued)				**Prepared:**	**07/03/2023 14:29**					
LCSD (B3G0019-BSD1)				**Analyzed:**	**07/03/2023 16:27**					
Ronnel	0.0874	0.0200	mg/kg	0.133		65.6	30-150	23.1	40	
Tetrachlorvinphos (Stirophos)	0.106	0.0200	mg/kg	0.133		79.3	30-150	28.3	40	
Tokuthion (Prothiofos)	0.141	0.0200	mg/kg	0.133		105	30-150	25.1	40	
Trichloronate	0.142	0.0200	mg/kg	0.133		106	30-150	21.8	40	
Surrogate: Tributylphosphate	*0.187*		*mg/kg*	*0.167*		*112*	*50-150*			

Enthalpy Analytical	AETL Job Number:	BEF0261	
931 W. Barkley Ave.	Project Number:	EO-487562	
Orange, CA 92868	Attention:	Patty Mata	
	Project Name:	EO-487562	Reported: 07/06/2023 13:38

Quality Control Results

Chlorinated Herbicides (EPA 8151A)

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: B3G0007 - 3550B				**Prepared:**	**07/03/2023 08:42**					
Method Blank (B3G0007-BLK1)				**Analyzed:**	**07/03/2023 10:53**					
Acifluorfen	ND	0.00250	mg/kg							
Bentazon	ND	0.00250	mg/kg							
Chloramben	ND	0.00250	mg/kg							
2,4-D	ND	0.00250	mg/kg							
2,4-DB	ND	0.00250	mg/kg							
DCPA diacid	ND	0.00250	mg/kg							
Dalapon	ND	0.00250	mg/kg							
Dicamba	ND	0.00250	mg/kg							
3,5-Dichlorobenzoic acid	ND	0.00250	mg/kg							
Dichloroprop	ND	0.00250	mg/kg							
Dinoseb	ND	0.00250	mg/kg							
MCPA	ND	0.250	mg/kg							
MCPP	ND	0.250	mg/kg							
4-Nitrophenol	ND	0.00250	mg/kg							
Pentachlorophenol (PCP)	ND	0.00250	mg/kg							
Picloram	ND	0.00250	mg/kg							
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	ND	0.00250	mg/kg							
2,4,5-TP	ND	0.00250	mg/kg							
Surrogate: DCAA	*0.0124*		*mg/kg*	*0.0250*		*49.5*	*30-140*			

Enthalpy Analytical	AETL Job Number:	BEF0261	
931 W. Barkley Ave.	Project Number:	EO-487562	
Orange, CA 92868	Attention:	Patty Mata	
	Project Name:	EO-487562	Reported: 07/06/2023 13:38

Quality Control Results

Chlorinated Herbicides (EPA 8151A)

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: B3G0007 - 3550B (Continued)				**Prepared:**	**07/03/2023 08:42**					
LCS (B3G0007-BS1)				**Analyzed:**	**07/03/2023 09:54**					
Acifluorfen	0.00399	0.00250	mg/kg	0.0125		32.0	32-160			
Bentazon	0.0141	0.00250	mg/kg	0.0125		113	30-160			
Chloramben	0.00346	0.00250	mg/kg	0.0125		27.7	30-140			BS
2,4-D	0.0110	0.00250	mg/kg	0.0125		88.1	30-151			
2,4-DB	0.00833	0.00250	mg/kg	0.0125		66.6	30-160			
DCPA diacid	0.00903	0.00250	mg/kg	0.0125		72.2	30-124			
Dalapon	0.0117	0.00250	mg/kg	0.0125		93.3	30-160			
Dicamba	0.00902	0.00250	mg/kg	0.0125		72.2	30-144			
3,5-Dichlorobenzoic acid	0.0121	0.00250	mg/kg	0.0125		96.9	30-160			
Dichloroprop	0.00873	0.00250	mg/kg	0.0125		69.8	30-160			
Dinoseb	0.00448	0.00250	mg/kg	0.0125		35.8	30-160			
MCPA	0.836	0.250	mg/kg	1.25		66.9	30-160			
MCPP	1.17	0.250	mg/kg	1.25		93.4	30-160			
Pentachlorophenol (PCP)	0.0122	0.00250	mg/kg	0.0125		97.3	30-160			
Picloram	0.00738	0.00250	mg/kg	0.0125		59.0	20-135			
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	0.0138	0.00250	mg/kg	0.0125		110	30-160			
2,4,5-TP	0.0107	0.00250	mg/kg	0.0125		85.4	30-157			
Surrogate: DCAA	*0.0146*		*mg/kg*	*0.0250*		*58.3*	*30-140*			
LCSD (B3G0007-BSD1)				**Analyzed:**	**07/03/2023 10:24**					
Acifluorfen	0.00415	0.00250	mg/kg	0.0125		33.2	32-160	3.92	40	
Bentazon	0.0160	0.00250	mg/kg	0.0125		128	30-160	12.7	40	
Chloramben	0.00455	0.00250	mg/kg	0.0125		36.4	30-140	27.1	40	
2,4-D	0.0116	0.00250	mg/kg	0.0125		93.2	30-151	5.55	40	
2,4-DB	0.00912	0.00250	mg/kg	0.0125		73.0	30-160	9.07	40	
DCPA diacid	0.00953	0.00250	mg/kg	0.0125		76.3	30-124	5.43	40	
Dalapon	0.0105	0.00250	mg/kg	0.0125		84.2	30-160	10.3	40	
Dicamba	0.00966	0.00250	mg/kg	0.0125		77.2	30-144	6.75	40	
3,5-Dichlorobenzoic acid	0.0108	0.00250	mg/kg	0.0125		86.2	30-160	11.8	40	
Dichloroprop	0.00810	0.00250	mg/kg	0.0125		64.8	30-160	7.46	40	
Dinoseb	0.00474	0.00250	mg/kg	0.0125		37.9	30-160	5.67	40	
MCPA	0.527	0.250	mg/kg	1.25		42.2	30-160	45.3	40	R
MCPP	1.20	0.250	mg/kg	1.25		96.3	30-160	3.04	40	
Pentachlorophenol (PCP)	0.0127	0.00250	mg/kg	0.0125		102	30-160	4.20	40	
Picloram	0.00773	0.00250	mg/kg	0.0125		61.8	20-135	4.65	40	
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	0.0142	0.00250	mg/kg	0.0125		114	30-160	3.37	40	
2,4,5-TP	0.0113	0.00250	mg/kg	0.0125		90.7	30-157	5.97	40	
Surrogate: DCAA	*0.0139*		*mg/kg*	*0.0250*		*55.6*	*30-140*			

Enthalpy Analytical	AETL Job Number:	BEF0261			
931 W. Barkley Ave.	Project Number:	EO-487562			
Orange, CA 92868	Attention:	Patty Mata			
	Project Name:	EO-487562		Reported:	07/06/2023 13:38

Qualifiers and Definitions

ITEM	Qualifiers
BS	The recovery of this analyte in LCS and/or LCSD was outside control limit. Sample was accepted based on the remaining LCSand/or LCSD.
R	The RPD was outside of QC acceptance limits due to possible matrix interference.
S6	Surrogate recovery is outside control limits due to matrix interference.

ITEM	Definitions
% wt	Percent Weight
%REC	Percent Recovery
°F	Degrees Fahrenheit
AETL	American Environmental Testing Laboratory, LLC
C	Carbon
CARB	California Air Resources Board
COC	Chain of Custody
Cresols	3-methylphenol/4-methylphenol coelute and cannot be chromatographically separated. Due to this coeluting isomer pair phenomenon, the laboratory uses a single cresol (4-methylphenol) as calibration standard for 3-methylphenol/4-methylphenol.
CRM	Certified Reference Material
DI	Deionized Water
DPD	Department of Planning and Development
DRO	Diesel Range Organics
Dup	Duplicate
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
GC/FID	Gas Chromatography Flame Ionization Detection
GRO	Gasoline Range Organics
HC	Hydrocarbon
HEM	Hexane Extractable Material
HMU	Hazardous Material Unit
ICP/MS	Inductively Coupled Plasma Mass Spectrometry
LACSD	Los Angeles County Sanitation Districts
LCS	Laboratory Control Sample - A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes.
LCSD	Laboratory Control Sample Duplicate - A replicate of Laboratory Control Sample.
LOQ	Limit of Quantitation
MDL	Method Detection Limit - The minimum measured concentration of a substance that can be reported with 99% confidence. MDL is statistically derived number which is specific for each instrument, each method and each compound.
mg/kg	Miligrams per Kilogram
mg/L	Miligrams per Liter
ml/L/hr	Milliliter per Liter per Hour

Enthalpy Analytical	AETL Job Number:	BEF0261			
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MRO	Motor oil Range Organics
MS	Matrix Spike - A sample prepared, taken through all sample preparation and analytical steps of the procedure and analyzed as an independent test results.
MSD	Matrix Spike Duplicate - A replicate of Matrix Spike Sample.
N	No
ND	Analyte is not detected below Method Detection Limit.
ng/m3	Nanograms per cubic meter
NIOSH	National Institute for Occupational Safety and Health
nL/L	Nanoliters per Liter
NTU	Nephelometric Turbidity Units
Ohm-cm	Ohms per centimeter
ORO	Oil Range Organics
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
ppb v	Parts per billion by volume
ppmC	Parts per million Carbon
PSU	Practical Salinity Unit
RL	Reporting Limit - The lowest concentration at which an analyte can be detected in a sample and its concentration can be reported with a specified degree of confidence, accuracy and precision. For usage at AETL, RL is equivalant to LOQ.
RPD	Relative Percent Difference
SIM	Selective Ion Monitoring
SM	Standard Method
SPLP	Synthetic Precipitation Leaching Procedure
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TTLC	Total Threshold Limit Concentrations
ug/kg	Micrograms per Kilogram
ug/L	Micrograms per Liter
ug/m3	Micrograms per cubic meter
WET	Waste Extraction Test
Y	Yes
ZHE	Zero Headspace Extraction

Appendix M-3

Soil Testing Memo May 2024

Project No.
16484.000.001

May 6, 2024

Ms. Bibiana Sparks
Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762

Subject: Scotts Valley Development
Vallejo, California

ADDITIONAL SOIL INVESTIGATION

Reference: Montrose Environmental, Soil Sample Results, Scotts Valley, Vallejo, California. July 19, 2023.

Dear Ms. Sparks:

We are pleased to submit the findings of the requested additional tailings soil investigation performed at the subject property (Property) in Vallejo, California (Figure 1, attached).

SITE LOCATION AND BACKGROUND

The Property is located northeast of the intersection of Interstate 80 and Columbus Parkway in Vallejo, California and is approximately 128 acres in area. The Property is currently vacant with plans for residential and commercial redevelopment.

The referenced report completed by Montrose Environmental ("Montrose") collected one soil sample from three tailings piles identified as Tailings A, Tailings B, and Tailings C. The samples were analyzed for total petroleum hydrocarbons for full carbon-chain (gasoline-, diesel-, and oil-range), volatile organic compounds, polychlorinated biphenyls, semi-volatile organic compounds, organochlorine pesticides, organophosphorus pesticides, chlorinated herbicides, and Title 22 metals. Montrose concluded, "Based on the soil sample results for the site, the lead detection in the sample identified as Tailings C exceeded the DTSC residential screening level of 80 mg/kg. The lead result does not exceed the industrial screening level of 500 mg/kg. Based on the proposed future use of the property, the detections of lead should be further sampled to determine the extent of impacts."

During our review of the referenced report, we confirmed the Tailings C sample also exhibited an elevated antimony concentration of 120 mg/kg, in excess of respective residential screening level, but not the commercial/industrial screening level.

Under the authorization of Acorn Environmental ("Acorn"), we performed additional soil sampling around the three identified tailings piles (A, B, and C) with laboratory analysis of lead and antimony.

FIELD SAMPLING

Field sampling was completed on April 23, 2024, and a total of nine soil samples were collected at varying depths from representative locations within Tailings A, Tailings B, and Tailings C. Figure 2 (attached) shows approximate locations of samples. The Tailings C pile is the location of the previous sample with elevated lead and antimony. Based on field observations, the Tailings C pile is approximately 75 cubic yards in volume. Tailings piles A and B were relatively smaller than the Tailings C pile, scattered with intermittent mounds less than 3 feet in height. We estimated the volume of both Tailings A and B piles to be less than 20 cubic yards (40 cubic yards total).

We collected samples using a combination of hand sampling techniques and backhoe equipment. We placed samples in new liners secured with plastic caps and tape, which upon collection were labeled, with a unique sample number, location, time/date collected, laboratory analysis, and the sampler's identification. We placed the soil samples in an ice-cooled chest and submitted them under documented chain-of-custody to McCampbell Analytical, Inc., a state-certified laboratory in Pittsburg, California. Discrete samples from the Tailings C pile were analyzed for lead and antimony by EPA Method 6020. Discrete samples from the Tailings A and Tailings B piles were analyzed for lead by EPA Method 6020.

RESULTS

We compared the analytical results to the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) residential and commercial environmental screening levels (ESLs)[1] and Department of Toxic Substances Control (DTSC)[2] residential and commercial screening levels (SLs).

Lead concentrations ranged from 4.3 to 63 mg/kg, which do not exceed residential or commercial screening criteria.

Antimony was not detected above laboratory reporting limits (<0.5 mg/kg).

Table A (attached) provides a summary of the analytical results. Laboratory reports are presented in their entirety in Appendix A, attached.

DISCUSSION AND RECOMMENDATIONS

This additional investigation has confirmed the single previously elevated sample for lead (and antimony) reported within the Tailings C pile appears to be an outlier and is limited to a relatively small portion. Further, by evaluating all of the analyzed data for the Tailings C pile results in aggregate, the arithmetic mean lead concentration of 52 mg/kg is below residential and commercial screening criteria, indicating the lead concentrations within the Tailing C pile are a de minimis concern. However, as a conservative measure, and since the proposed development includes commercial and residential land use, Tailings C material can be appropriately managed to be located within a commercial land use area. Alternatively, a portion of Tailings C material could be offhauled and disposed of off site if desired.

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[1] SFBRWQCB; Environmental Screening Levels (ESLs); Direct Exposure Human Health Risk Levels: Residential Shallow Soil Exposure and Commercial/Industrial Shallow Soil Exposure (Table S-1); 2019 (Rev. 2).

[2] DTSC Human and Ecological Risk Office (HERO) Note 3; Screening Levels (SLs); Table 1: Soil; Residential Soil Exposure and Commercial/Industrial; June 2020, Revised May 2022.

If you have any questions or comments regarding this letter, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

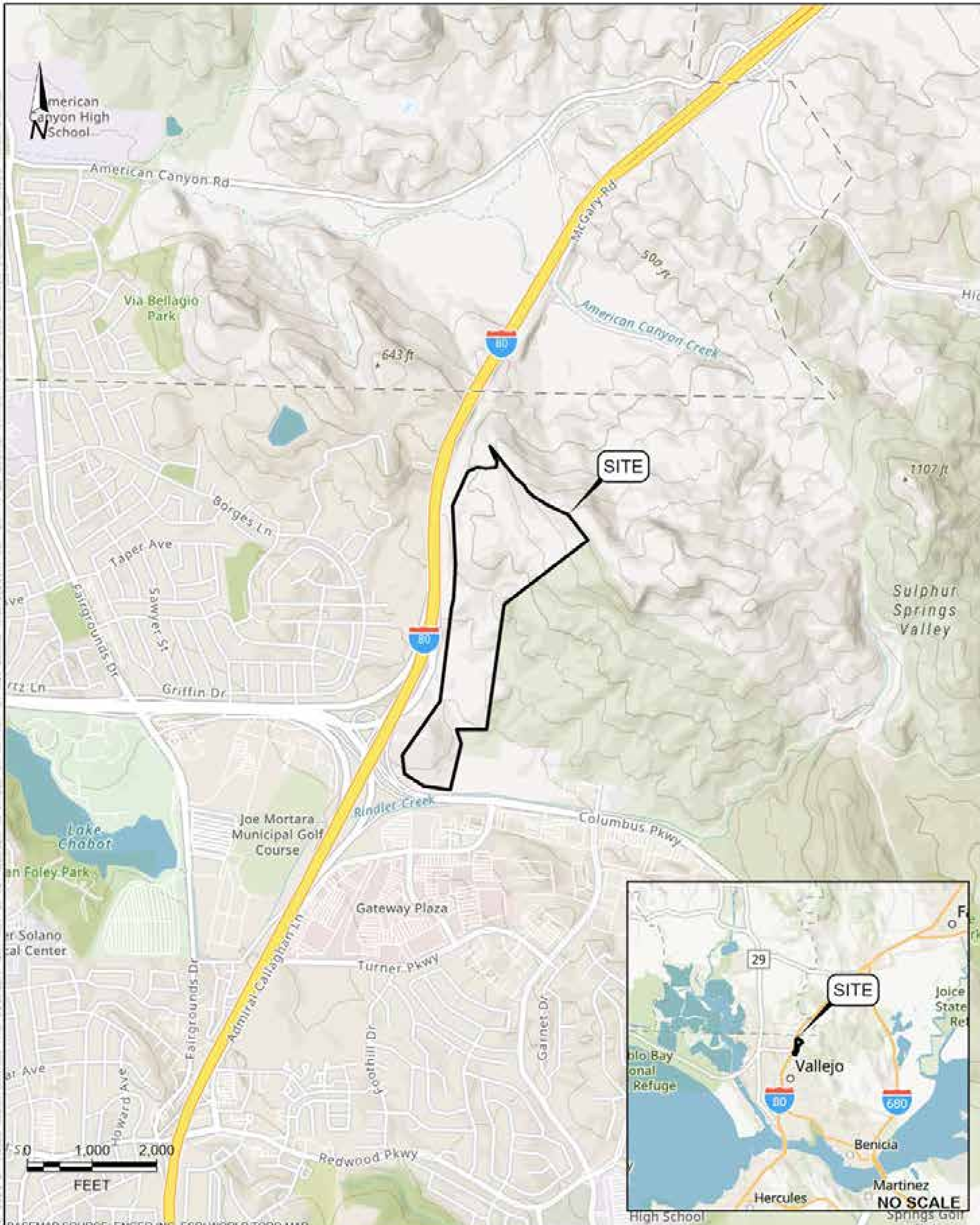
Scott Johns, PE

Jeffrey A. Adams, PhD, PE

sj/jaa/cb

Attachments: Figures 1 and 2
Table A
Appendix A – Laboratory Analytical Reports

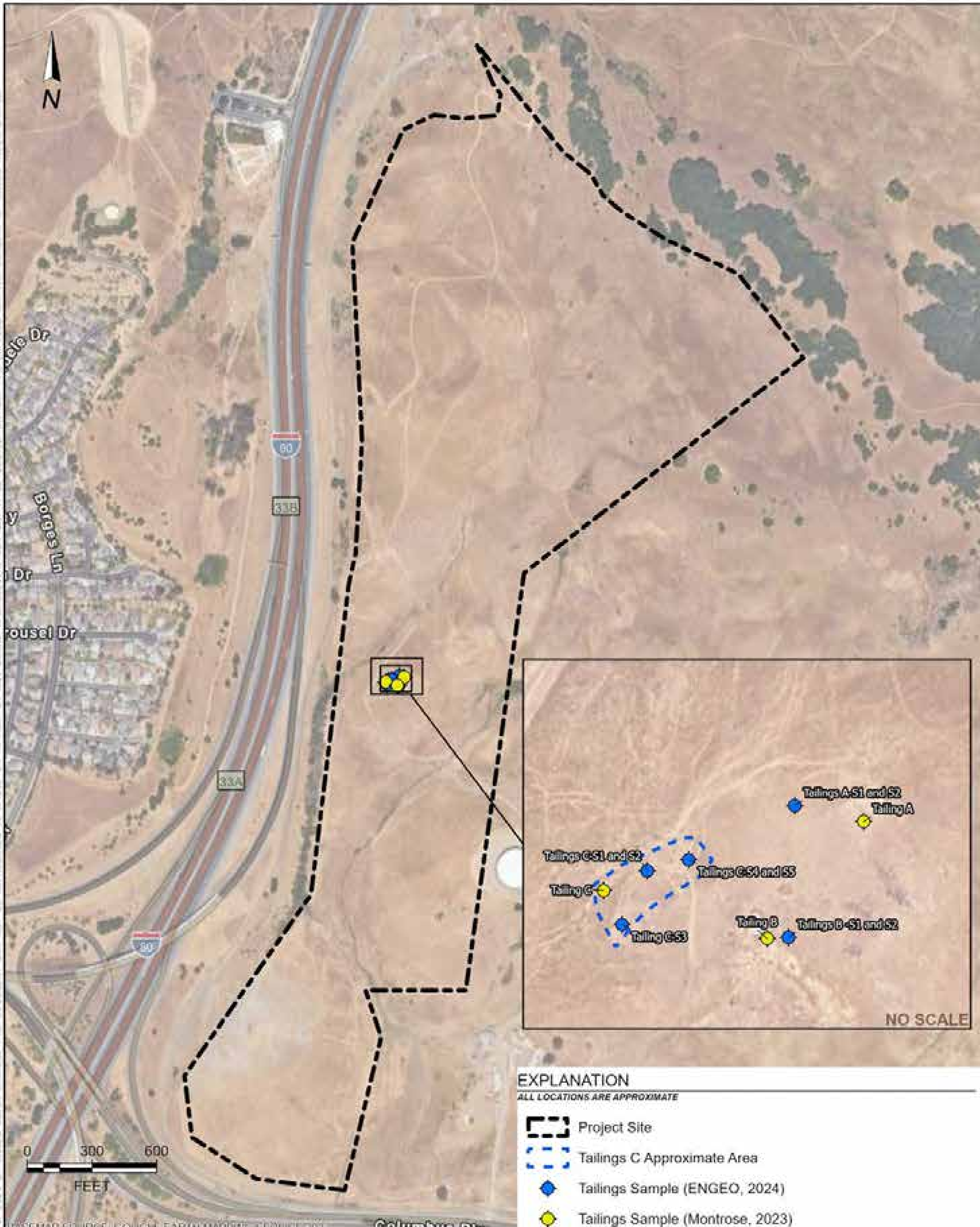
FIGURES



ENGEO Expect Excellence	VICINITY MAP VALLEJO SCOTTS VALLEY VALLEJO, CALIFORNIA	PROJECT NO.: 16484.000.001 SCALE: AS SHOWN DRAWN BY: CMG CHECKED BY: SPM	FIGURE NO. 1

ORIGINAL FIGURE PRINTED IN COLOR

PATH: G:\DRAFTING\PROJECTS_16000 TO 17999\16484\16484000001\SOIL_SAMPLING\16484000001_VALLEJO_SCOTTS_VALLEY.APRX
LAYOUT: 01. VICINITY 8.5 X 11 PORTRAIT USER: CGUERIN



ENGEO Expect Excellence	SITE PLAN VALLEJO SCOTTS VALLEY VALLEJO, CALIFORNIA	PROJECT NO.: 16484.000.001 SCALE: AS SHOWN DRAWN BY: CMG CHECKED BY: SPM	FIGURE NO. 2

ORIGINAL FIGURE PRINTED IN COLOR

PATH: G:\DRAFTING\PROJECTS_16000 TO 17999\16484\16484000001\SOIL_SAMPLING\16484000001_VALLEJO_SCOTTS_VALLEY.APRX
LAYOUT: 02_SITE PLAN 8.5 X 11 PORTRAIT USER: CGUERIN

TABLE A

Soil Analytical Data Summary

16484.000.001
May 6, 2024

TABLE A -- Soil Analytical Data Summary

Sample ID	Depth	Date Collected	Antimony	Arsenic[7]	Barium	Beryllium	Cadmium	Chromium (total)	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Arsenic (6020)	Thallium (6020)
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SFBRWQCB Residential ESL[1]			**11**	**0.067[8]**	**15,000**	**16**	**78**	**-- ***	**23**	**3,100**	**80**	**13**	**390**	**820**	**390**	**390**	**0.78**	**390**	**23,000**	**0.067[8]**	**0.78**
SFBRWQCB Commercial ESL[2]			**160**	**0.31[8]**	**220,000**	**230**	**1,100**	**--**	**350**	**47,000**	**320**	**190**	**5,800**	**11,000**	**5,800**	**5,800**	**12**	**5,800**	**350,000**	**0.31[8]**	**12**
DTSC HERO Note 3 Residential SL[3]			**--**	**0.11[8]**	**--**	**16**	**7.1**	**--**	**--**	**--**	**80**	**1.0**	**--**	**820**	**--**	**--**	**--**	**--**	**--**	**0.11[8]**	**--**
DTSC HERO Note 3 Commercial SL[4]			**--**	**0.36[8]**	**--**	**230**	**79**	**--**	**--**	**--**	**500**	**4.4**	**--**	**11,000**	**--**	**--**	**--**	**--**	**--**	**0.36[8]**	**--**
USEPA Residential RSL[5]			**31**	**0.68[8]**	**15,000**	**160**	**7.1**	**--**	**23**	**3,100**	**400**	**11**	**390**	**1,500**	**390**	**390**	**0.78**	**390**	**23000**	**0.68[8]**	**390**
USEPA Industrial RSL[6]			**470**	**3[8]**	**220,000**	**2,300**	**100**	**--**	**350**	**47,000**	**800**	**46**	**5,800**	**22,000**	**5,800**	**5,800**	**12**	**5,800**	**350,000**	**3[8]**	**5,800**
Tailing A	--	6/27/2023	<2.9	4.7	660	<0.49	<0.49	55	15	82	27	<0.15	<0.97	91	<2.9	<0.49	<2.9	42	62	7.2	<0.97
Tailing B	--	6/27/2023	<3.0	6.9	220	<0.50	<0.50	50	14	46	25	<0.16	<0.99	86	<3.0	<0.50	<3.0	40	54	10	<0.99
Tailing C	--	6/27/2023	120	5.5	2,300	<0.48	<0.48	26	10	150	280	0.2	<0.95	46	<2.9	<0.48	<2.9	42	48	8.4	<0.95
Composite	--	6/27/2023	<2.9	4.6	1,400	<0.49	<0.49	43	12	83	43	<0.16	<0.98	76	<2.9	<0.49	<2.9	40	61	6.8	<0.98
Tailing C-S1	1ft	4/23/2024	<0.5	--	--	--	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--
Tailing C-S2	3ft	4/23/2024	<0.5	--	--	--	--	--	--	--	7.6	--	--	--	--	--	--	--	--	--	--
Tailing C-S3	1ft	4/23/2024	<0.5	--	--	--	--	--	--	--	6.5	--	--	--	--	--	--	--	--	--	--
Tailing C-S4	1ft	4/23/2024	<0.5	--	--	--	--	--	--	--	4.3	--	--	--	--	--	--	--	--	--	--
Tailing C-S5	3ft	4/23/2024	<0.5	--	--	--	--	--	--	--	13	--	--	--	--	--	--	--	--	--	--
Tailing B-S1	1ft	4/23/2024	--	--	--	--	--	--	--	--	55	--	--	--	--	--	--	--	--	--	--
Tailing B-S2	3ft	4/23/2024	--	--	--	--	--	--	--	--	63	--	--	--	--	--	--	--	--	--	--
Tailing A-S1	1ft	4/23/2024	--	--	--	--	--	--	--	--	9.3	--	--	--	--	--	--	--	--	--	--
Tailing A-S2	3ft	4/23/2024	--	--	--	--	--	--	--	--	12	--	--	--	--	--	--	--	--	--	--

Notes:

Results are shown in milligrams per kilogram (mg/kg).

<x.xx indicates analyte was not detected above the laboratory reporting limit of x.xx mg/kg.

-- indicates analyte was not analyzed or screening level not established.

Highlighted values exceed residential screening criteria.

Highlighted values exceed commercial screening criteria.

[1] San Francisco Bay Regional Water Quality Control Board (SFBRWQCB); Environmental Screening Levels (ESLs); Direct Exposure Human Health Risk Levels: Residential Shallow Soil Exposure (Table S-1); 2019 (Rev. 2).

[2] San Francisco Bay Regional Water Quality Control Board (SFBRWQCB); Environmental Screening Levels (ESLs); Direct Exposure Human Health Risk Levels: Commercial/Industrial Shallow Soil Exposure (Table S-1); 2019 (Rev. 2).

[3] Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Note 3; Screening Levels (SLs); Table 1: Soil; Residential Soil Exposure; June 2020, Revised May 2022.

[4] Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Note 3; Screening Levels (SLs); Table 1: Soil; Commercial/Industrial Soil Exposure; June 2020, Revised May 2022.

[5] Environmental Protection Agency (EPA); Regional Screening Levels (RSLs); Residential Soil; November 2023.

[6] Environmental Protection Agency (EPA); Regional Screening Levels (RSLs); Industrial Soil; November 2023.

[7] The commonly accepted naturally occurring background concentration for arsenic in the urbanized Bay Area is 11 mg/kg (Duverge, D.J., Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region, December 2011).

* Chromium III Residential ESL is 120,000 mg/kg.

APPENDIX A

MCCAMPBELL ANALYTICAL, INC.

Laboratory Analytical Reports

McCampbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 2404J24

Report Created for: ENGEO Incorporated

2010 Crow Canyon Place, Ste 250
San Ramon, CA 94583-4634

Project Contact: Scott Johns
Project P.O.:
Project: 16484.000.001; Scotts Valley Development

Project Location:
Project Received: 04/23/2024

Analytical Report reviewed & approved for release on 05/01/2024 by:

Jena Alfaro
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in a case narrative.

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Glossary of Terms & Qualifier Definitions

Client: ENGEO Incorporated **WorkOrder:** 2404J24

Project: 16484.000.001; Scotts Valley Development

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
CCV	Continuing Calibration Verification.
CCV REC (%)	% recovery of Continuing Calibration Verification.
CPT	Consumer Product Testing not NELAP Accredited
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 μm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LCS2	Second LCS for the batch. Spike level is lower than that for the first LCS; applicable to method 1633.
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit [1]
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit [2]
RPD	Relative Percent Difference
RRT	Relative Retention Time
RSD	Relative Standard Deviation
SNR	Surrogate is diluted out of the calibration range
SPK Val	Spike Value

[1] MDL is the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results. Definition and Procedure for the Determination of the Method Detection Limit, Revision 2, 40CFR, Part 136, Appendix B, EPA 821-R-16-006, December 2016. Values are based upon our default extraction volume/amount and are subject to change.

[2] RL is the lowest level that can be reliably determined within specified limits of precision and accuracy during routine laboratory operating conditions. (The RL cannot be lower than the lowest calibration standard used in the initial calibration of the instrument and must be greater than the MDL.) Values are based upon our default extraction volume/amount and are subject to change.

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Glossary of Terms & Qualifier Definitions

Client: ENGEO Incorporated **WorkOrder:** 2404J24

Project: 16484.000.001; Scotts Valley Development

SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TNTC	"Too Numerous to Count;" greater than 250 colonies observed on the plate.
TZA	TimeZone Net Adjustment for sample collected outside of MAI's Coordinated Universal Time (UTC). (Adjustment for Daylight Saving is not accounted.)
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2404J24
Date Received:	04/23/2024 13:45	**Extraction Method:**	SW3050B
Date Prepared:	04/24/2024-05/01/2024	**Analytical Method:**	SW6020
Project:	16484.000.001; Scotts Valley Development	**Unit:**	mg/kg

Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing C-S1	**2404J24-001A**	**Soil**	**04/23/2024 09:48**	**ICP-MS4 178SMPL.d**	**292491**

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	04/26/2024 14:41
Lead	**10**	0.50	1	04/26/2024 14:41

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	103	70-130	04/26/2024 14:41

Analyst(s): WV

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing C-S2	**2404J24-002A**	**Soil**	**04/23/2024 09:53**	**ICP-MS5 208SMPL.d**	**292782**

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	05/01/2024 16:34
Lead	**7.6**	0.50	1	05/01/2024 16:34

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	104	70-130	05/01/2024 16:34

Analyst(s): AL

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing C-S3	**2404J24-003A**	**Soil**	**04/23/2024 10:02**	**ICP-MS4 179SMPL.d**	**292491**

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	04/26/2024 14:45
Lead	**6.5**	0.50	1	04/26/2024 14:45

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	103	70-130	04/26/2024 14:45

Analyst(s): WV

(Cont.)

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2404J24
Date Received:	04/23/2024 13:45	**Extraction Method:**	SW3050B
Date Prepared:	04/24/2024-05/01/2024	**Analytical Method:**	SW6020
Project:	16484.000.001; Scotts Valley Development	**Unit:**	mg/kg

Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing C-S4	**2404J24-004A**	**Soil**	**04/23/2024 11:34**	**ICP-MS4 121SMPL.d**	**292334**

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	04/25/2024 11:14
Lead	**4.3**	0.50	1	04/25/2024 11:14

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	104	70-130	04/25/2024 11:14

Analyst(s): WV

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing C-S5	**2404J24-005A**	**Soil**	**04/23/2024 12:20**	**ICP-MS4 105SMPL.d**	**292338**

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.50	1	04/24/2024 15:35
Lead	**13**	0.50	1	04/24/2024 15:35

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	109	70-130	04/24/2024 15:35

Analyst(s): MIG

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing B-S1	**2404J24-006A**	**Soil**	**04/23/2024 10:43**	**ICP-MS4 180SMPL.d**	**292491**

Analytes	Result	RL	DF	Date Analyzed
Lead	**55**	0.50	1	04/26/2024 14:49

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	108	70-130	04/26/2024 14:49

Analyst(s): WV

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2404J24
Date Received:	04/23/2024 13:45	**Extraction Method:**	SW3050B
Date Prepared:	04/24/2024-05/01/2024	**Analytical Method:**	SW6020
Project:	16484.000.001; Scotts Valley Development	**Unit:**	mg/kg

Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing B-S2	**2404J24-007A**	**Soil**	**04/23/2024 10:45**	**ICP-MS4 124SMPL.d**	**292338**

Analytes	Result	RL	DF	Date Analyzed
Lead	**63**	0.50	1	04/25/2024 11:26

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	106	70-130	04/25/2024 11:26

Analyst(s): WV

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing A-S1	**2404J24-008A**	**Soil**	**04/23/2024 11:43**	**ICP-MS4 181SMPL.d**	**292491**

Analytes	Result	RL	DF	Date Analyzed
Lead	**9.3**	0.50	1	04/26/2024 14:53

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	107	70-130	04/26/2024 14:53

Analyst(s): WV

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailing A-S2	**2404J24-009A**	**Soil**	**04/23/2024 11:50**	**ICP-MS4 125SMPL.d**	**292338**

Analytes	Result	RL	DF	Date Analyzed
Lead	**12**	0.50	1	04/25/2024 11:30

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	104	70-130	04/25/2024 11:30

Analyst(s): WV

Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2404J24
Date Prepared:	04/24/2024	**BatchID:**	292334
Date Analyzed:	04/24/2024	**Extraction Method:**	SW3050B
Instrument:	ICP-MS5	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.000.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-292334

QC Summary Report for Metals

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Antimony	ND	0.10	0.50	-	-	-
Lead	ND	0.089	0.50	-	-	-
Surrogate Recovery						
Terbium	510			500	102	70-130

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Antimony	48	48	50	96	97	75-125	0.737	20
Lead	49	49	50	98	98	75-125	0.493	20
Surrogate Recovery								
Terbium	520	500	500	104	100	70-130	3.66	20

(Cont.)

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2404J24
Date Prepared:	04/24/2024	**BatchID:**	292338
Date Analyzed:	04/24/2024	**Extraction Method:**	SW3050B
Instrument:	ICP-MS4	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.000.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-292338 2404J24-005AMS/MSD

QC Summary Report for Metals

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Antimony	ND	0.10	0.50	-	-	-
Lead	ND	0.089	0.50	-	-	-
Surrogate Recovery						
Terbium	540			500	108	70-130

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Antimony	50	52	50	100	104	75-125	3.79	20
Lead	51	50	50	101	101	75-125	0.512	20
Surrogate Recovery								
Terbium	550	560	500	110	112	70-130	1.55	20

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Antimony	1	49	50	50	ND	98	101	75-125	2.76	20
Lead	1	55	56	50	12.58	86	88	75-125	1.76	20
Surrogate Recovery										
Terbium	1	530	560	500		106	111	70-130	4.48	20

Analyte	DLT Result	DLTRef Val	%D	%D Limit
Antimony	ND<2.5	ND		-
Lead	13	13	2.36	20

%D Control Limit applied to analytes with concentrations greater than 25 times the reporting limits.

(Cont.)

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2404J24
Date Prepared:	04/25/2024	**BatchID:**	292491
Date Analyzed:	04/26/2024	**Extraction Method:**	SW3050B
Instrument:	ICP-MS4	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.000.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-292491

QC Summary Report for Metals

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Antimony	ND	0.10	0.50	-	-	-
Lead	ND	0.089	0.50	-	-	-
Surrogate Recovery						
Terbium	540			500	109	70-130

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Antimony	51	51	50	102	103	75-125	1.24	20
Lead	50	50	50	101	100	75-125	0.846	20
Surrogate Recovery								
Terbium	540	540	500	108	108	70-130	0.0702	20

(Cont.)

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2404J24
Date Prepared:	05/01/2024	**BatchID:**	292782
Date Analyzed:	05/01/2024	**Extraction Method:**	SW3050B
Instrument:	ICP-MS5	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.000.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-292782

QC Summary Report for Metals

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Antimony	ND	0.10	0.50	-	-	-
Lead	ND	0.089	0.50	-	-	-
Surrogate Recovery						
Terbium	530			500	105	70-130

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Antimony	54	53	50	108	106	75-125	1.14	20
Lead	52	51	50	104	101	75-125	2.99	20
Surrogate Recovery								
Terbium	530	530	500	106	105	70-130	0.731	20

McCampbell Analytical, Inc.

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CHAIN-OF-CUSTODY RECORD

WorkOrder: 2404J24 **ClientCode: ENGE**

☐ WaterTrax ☐ CLIP ☐ EDF ☐ EQuIS ☐ Dry-Weight ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag
☐ Detection Summary ☑ Excel []

Report to:
Scott Johns
ENGEO Incorporated
2010 Crow Canyon Place, Ste 250
San Ramon, CA 94583-4634
(925) 866-9000 FAX: 888-279-2698

Email: sjohns@engeo.com
cc/3rd Party:
PO:
Project: 16484.000.001; Scotts Valley Development

Bill to:
Chantelle Maloney
ENGEO Incorporated
2010 Crow Canyon Place, Ste 250
San Ramon, CA 94583-4634
AP@engeo.com; cmaloney@engeo.co

Requested TAT: **5 days;**

Date Received: **04/23/2024**
Date Logged: **04/23/2024**

					Requested Tests (See legend below)											
Lab ID	**ClientSampID**	**Matrix**	**Collection Date**	**Hold**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2404J24-001	Tailing C-S1	Soil	4/23/2024 09:48	☐	A	A										
2404J24-002	Tailing C-S2	Soil	4/23/2024 09:53	☐	A	A										
2404J24-003	Tailing C-S3	Soil	4/23/2024 10:02	☐	A	A										
2404J24-004	Tailing C-S4	Soil	4/23/2024 11:34	☐	A	A										
2404J24-005	Tailing C-S5	Soil	4/23/2024 12:20	☐	A	A										
2404J24-006	Tailing B-S1	Soil	4/23/2024 10:43	☐	A	A										
2404J24-007	Tailing B-S2	Soil	4/23/2024 10:45	☐	A	A										
2404J24-008	Tailing A-S1	Soil	4/23/2024 11:43	☐	A	A										
2404J24-009	Tailing A-S2	Soil	4/23/2024 11:50	☐	A	A										

Test Legend:

1	METALSMS_TTLC_S	2	PRDisposal Fee	3		4	
5		6		7		8	
9		10		11		12	

Prepared by: Natalie Zaragoza

Comments:

NOTE: Soil samples are discarded 60 days after receipt unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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WORK ORDER SUMMARY

Client Name: ENGEO INCORPORATED
Project: 16484.000.001; Scotts Valley Development
Work Order: 2404J24
Client Contact: Scott Johns
QC Level: LEVEL 2
Contact's Email: sjohns@engeo.com
Comments:
Date Logged: 4/23/2024

☐ WaterTrax ☐ CLIP ☐ EDF ☑ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

LabID	ClientSampID	Matrix	Test Name	Cont./ Comp.	Bottle & Preservative	U**	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	Sub Out
001A	Tailing C-S1	Soil	SW6020 (Metals) <Antimony, Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 9:48	5 days	4/30/2024		☐	☐
002A	Tailing C-S2	Soil	SW6020 (Metals) <Antimony, Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 9:53	5 days	4/30/2024		☐	☐
003A	Tailing C-S3	Soil	SW6020 (Metals) <Antimony, Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 10:02	5 days	4/30/2024		☐	☐
004A	Tailing C-S4	Soil	SW6020 (Metals) <Antimony, Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 11:34	5 days	4/30/2024		☐	☐
005A	Tailing C-S5	Soil	SW6020 (Metals) <Antimony, Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 12:20	5 days	4/30/2024		☐	☐
006A	Tailing B-S1	Soil	SW6020 (Metals) <Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 10:43	5 days	4/30/2024		☐	☐
007A	Tailing B-S2	Soil	SW6020 (Metals) <Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 10:45	5 days	4/30/2024		☐	☐
008A	Tailing A-S1	Soil	SW6020 (Metals) <Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 11:43	5 days	4/30/2024		☐	☐
009A	Tailing A-S2	Soil	SW6020 (Metals) <Lead>	1	Stainless Steel tube 2"x6"	☐	☐	☐	4/23/2024 11:50	5 days	4/30/2024		☐	☐

NOTES: * STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- ISM prep requires 5 to 10 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 6 to 11 days from sample submission). Due date listed on WO summary will not accurately reflect the time needed for sample preparation.

- Organic extracts are held for 40 days before disposal; Inorganic extract are held for 30 days.

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

U = An unpreserved container was received for a method that suggests a preservation in order to extend hold time for analysis.**

Cont./Comp. = Containers /Composites

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WORK ORDER SUMMARY

Client Name: ENGEO INCORPORATED **Project:** 16484.000.001; Scotts Valley Development **Work Order:** 2404J24

Client Contact: Scott Johns **QC Level:** LEVEL 2

Contact's Email: sjohns@engeo.com **Comments:** **Date Logged:** 4/23/2024

☐ WaterTrax ☐ CLIP ☐ EDF ☑ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

LabID	ClientSampID	Matrix	Test Name	Cont./ Comp.	Bottle & Preservative	U**	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	Sub Out

NOTES: *** STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).**

- ISM prep requires 5 to 10 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 6 to 11 days from sample submission). Due date listed on WO summary will not accurately reflect the time needed for sample preparation.

- Organic extracts are held for 40 days before disposal; Inorganic extract are held for 30 days.

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U = An unpreserved container was received for a method that suggests a preservation in order to extend hold time for analysis.**

Cont./Comp. = Containers /Composites

2404J24

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 16484.000.001

PROJECT NAME: Scotts Valley Developoment

SAMPLED BY: (SIGNATURE/PRINT) Lars Besson

PROJECT MANAGER: Scott Johns

ROUTING: E-MAIL sjohns@engeo.com | Hard Copy NA

SAMPLE NUMBER	DATE	TIME	MATRIX	NUMBER OF CONTAINERS	CONTAINER SIZE	PRESERVATIVE	Lead (6010B)	Antimony (6010B)	REMARKS REQUIRED DETECTION LIMITS
Tailing C-S1	4/23/24	9:48	soil	1	2x6 liner	ICE	X	X	
Tailing C-S2	↓	9:53	↓	↓	↓	↓	X	X	
Tailing C-S3	↓	10:02	↓	↓	↓	↓	X	X	
Tailing C-S4	↓	11:34	↓	↓	↓	↓	X	X	
Tailing C-S5	↓	12:20	↓	↓	↓	↓	X	X	
Tailing B-S1	↓	10:43	↓	↓	↓	↓	X		
Tailing B-S2	↓	10:45	↓	↓	↓	↓	X		
Tailing A-S1	↓	11:43	↓	↓	↓	↓	X		
Tailing A-S2	↓	11:50	↓	↓	↓	↓	X		

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	4/23/24 1:45	[signature]	4/23/24 1345		
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
			3. [signature]		
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS	
				Standard 5-day TAT. Homogenzie samples.	

ENGEO INCORPORATED

2010 CROW CANYON PLACE, SUITE 250
SAN RAMON, CALIFORNIA 94583
(925) 866-9000 FAX (888) 279-2698
WWW.ENGEO.COM

DISTRIBUTION: ORIGINAL ACCOMPANIES SHIPMENT; COPY TO PROJECT FIELD FILES

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Sample Receipt Checklist

Client Name:	ENGEO Incorporated	Date and Time Received:	4/23/2024 13:45
Project:	16484.000.001; Scotts Valley Development	Date Logged:	4/23/2024
		Received by:	Lilly Ortiz
WorkOrder №:	2404J24 Matrix:	Logged by:	Natalie Zaragoza
Carrier:	Client Drop-In		

Chain of Custody (COC) Information

	Yes	No	NA
Chain of custody present?	☑	☐	
Chain of custody signed when relinquished and received?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Sample IDs noted by Client on COC?	☑	☐	
Date and Time of collection noted by Client on COC?	☑	☐	
Sampler's name noted on COC?	☑	☐	
COC agrees with Quote?	☐	☐	☑

Sample Receipt Information

	Yes	No	NA
Custody seals intact on shipping container/cooler?	☐	☐	☑
Custody seals intact on sample bottles?	☐	☐	☑
Shipping container/cooler in good condition?	☑	☐	
Samples in proper containers/bottles?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	

Sample Preservation and Hold Time (HT) Information

	Yes	No	NA
All samples received within holding time?	☑	☐	☐
Samples Received on Ice?	☑	☐	
	(Ice Type: WET ICE)		
Sample/Temp Blank temperature	Temp: 3.1°C		☐
ZHS conditional analyses: VOA meets zero headspace requirement (VOCs, TPHg/BTEX, RSK)?	☐	☐	☑
Sample labels checked for correct preservation?	☑	☐	
pH acceptable upon receipt (Metal: <2; Nitrate 353.2/4500NO3: <2; 522: <4; 218.7: >8)?	☐	☐	☑
UCMR Samples:			
pH tested and acceptable upon receipt (200.7: ≤2; 533: 6 - 8; 537.1: 6 - 8)?	☐	☐	☑
Free Chlorine tested and acceptable upon receipt (<0.1mg/L) [not applicable to 200.7]?	☐	☐	☑

Comments:

Appendix M-4

Soil Testing Memo July 2024

Project No.
16484.001.001

July 1, 2024

Mr. Casey Spanish
Integrated Resort Development
3330 West Desert Inn Road
Las Vegas, NV 89102

Subject: Scotts Valley Development
Vallejo, California

STOCKPILE TESTING FOR DISPOSAL

Dear Mr. Spanish:

ENGEO was retained by Integrated Resort Development (IRD) to perform sample collection with laboratory analysis for a stockpile of approximately 75 cubic yards in volume. The stockpile, identified as Tailings C pile, is located within the Scotts Valley Development project in Vallejo, California (see Figure 1, attached) and IRD would like to dispose of it off site.

SOIL SAMPLING AND LABORATORY TESTING

ENGEO collected four soil samples from the stockpile using typical hand sampling equipment.

We did not observe visual or olfactory evidence of impact.

Soil samples were collected in 2-inch-by-6-inch stainless-steel liners, sealed with Teflon® sheeting and snug-fitting end caps. Samples were placed into an ice-cooled chest and delivered to an accredited analytical laboratory under documented chain-of-custody.

The outside laboratory analyzed samples on a discrete basis and metals on a 4:1 composite basis, for the following.

- CAM-17 metals (EPA Method 6020 and EPA Method 7471A; composite)
- Organochlorine pesticides (OCPs) (EPA Method 8081, discrete)
- Polychlorinated biphenyls (PCBs) (EPA Method 8082, discrete)
- Volatile organic compounds (VOCs) with total petroleum hydrocarbons as gasoline (TPH-g) (EPA Method 8260B, discrete)
- Semi-volatile organic compounds (SVOCs) (EPA Method 8270, discrete)
- Total petroleum hydrocarbons as diesel and motor oil (TPH-d and -mo) (EPA Method 8015M, discrete)
- STLC extraction and analysis

ANALYTICAL RESULTS

Laboratory reports are attached.

As expected, several metals were detected and include the following: arsenic (2.9 milligrams per kilogram (mg/kg)), barium (1,700 mg/kg), beryllium (0.8 mg/kg), chromium (77 mg/kg), cobalt (13 mg/kg), copper (200 mg/kg), lead (9.2 mg/kg), mercury (0.17 mg/kg), nickel (120 mg/kg), selenium (0.65 mg/kg), vanadium (72 mg/kg), and zinc (72 mg/kg). Supplemental STLC-barium and STLC-chromium analysis was performed and reported 39 milligrams per liter (mg/L) and not detectable at or above laboratory the respective reporting limit (ND), respectively.

The samples did not exhibit TPH-g concentrations above laboratory reporting limits. TPH-d was also not detectable above laboratory reporting limits. TPH-mo concentrations ranged from ND to 11 mg/kg.

VOCs and SVOCs were not detectable above laboratory report limits with the exception of toluene that reported ND to 0.013 mg/kg.

OCPs were not detectable above laboratory reporting limits.

PCBs were not detectable above laboratory reporting limits.

FINDINGS

None of the detected concentrations exceed respective San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels[1] (ESLs) for a residential or commercial use exposure scenario with the exception of arsenic; however, arsenic concentrations are within the typical natural background concentration of 11 mg/kg[2].

IRD would like to dispose of stockpile soil off site, and given this assessment, it is our opinion that a landfill facility would classify the material as Class II non-hazardous waste for disposal purposes. Material is likely also suitable for daily landfill cover which is less expensive. Project data should be provided to potential landfill dispose sites to profile and confirm material is suitable for disposal at their facility.

If you have any questions or comments regarding this letter, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

Scott Johns

Scott Johns, PE Shawn Munger, CHG

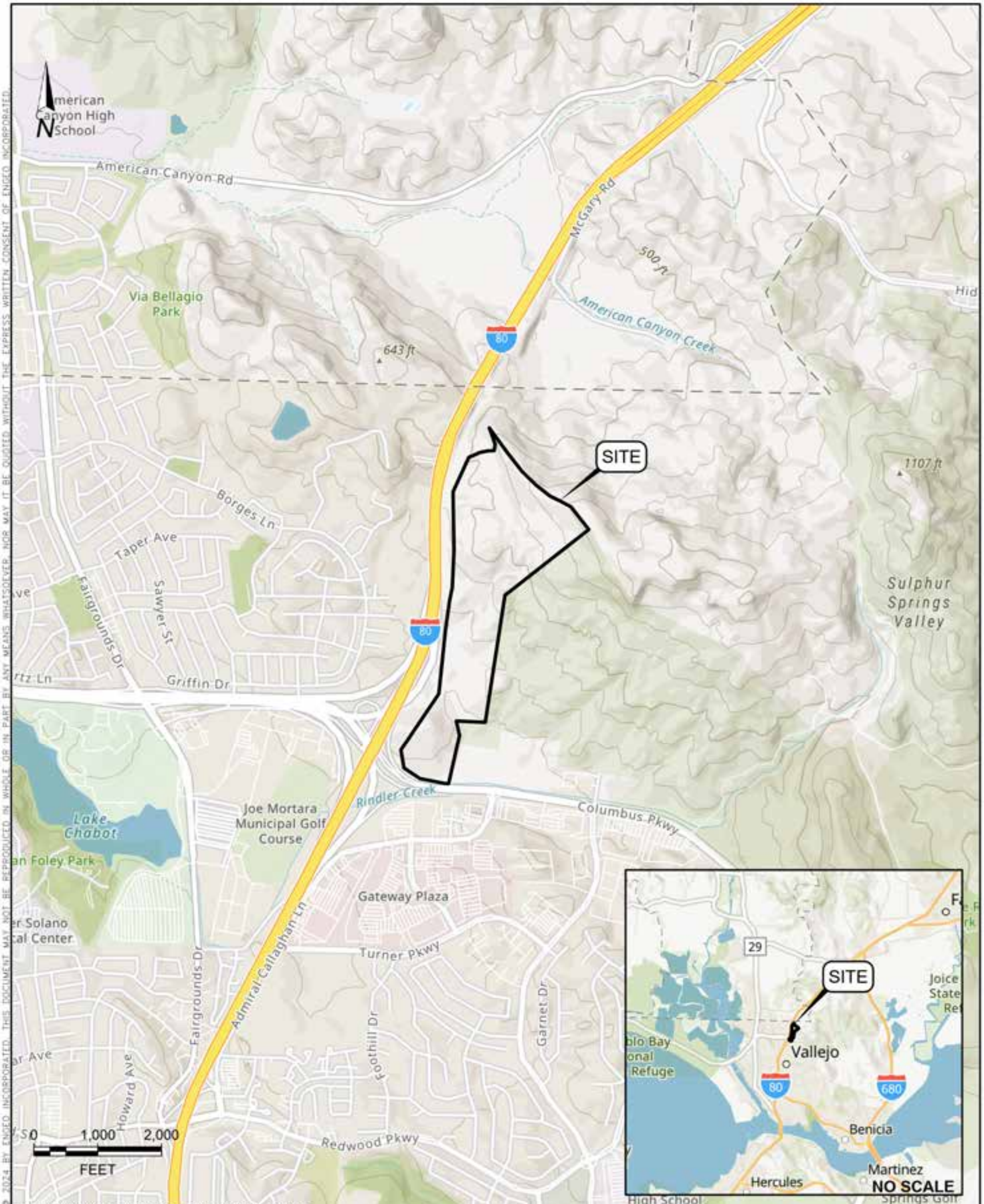
sj/sm/cb

Attachments: Figures
Laboratory Reports

[1] RWQCB ESLs, Direct Exposure Human Health Risk Levels (Table S-1), Residential and Commercial/Industrial: Shallow Soil Exposure; 2019, Rev 2.

[2] Duvergé, Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region, December 2011.

FIGURES



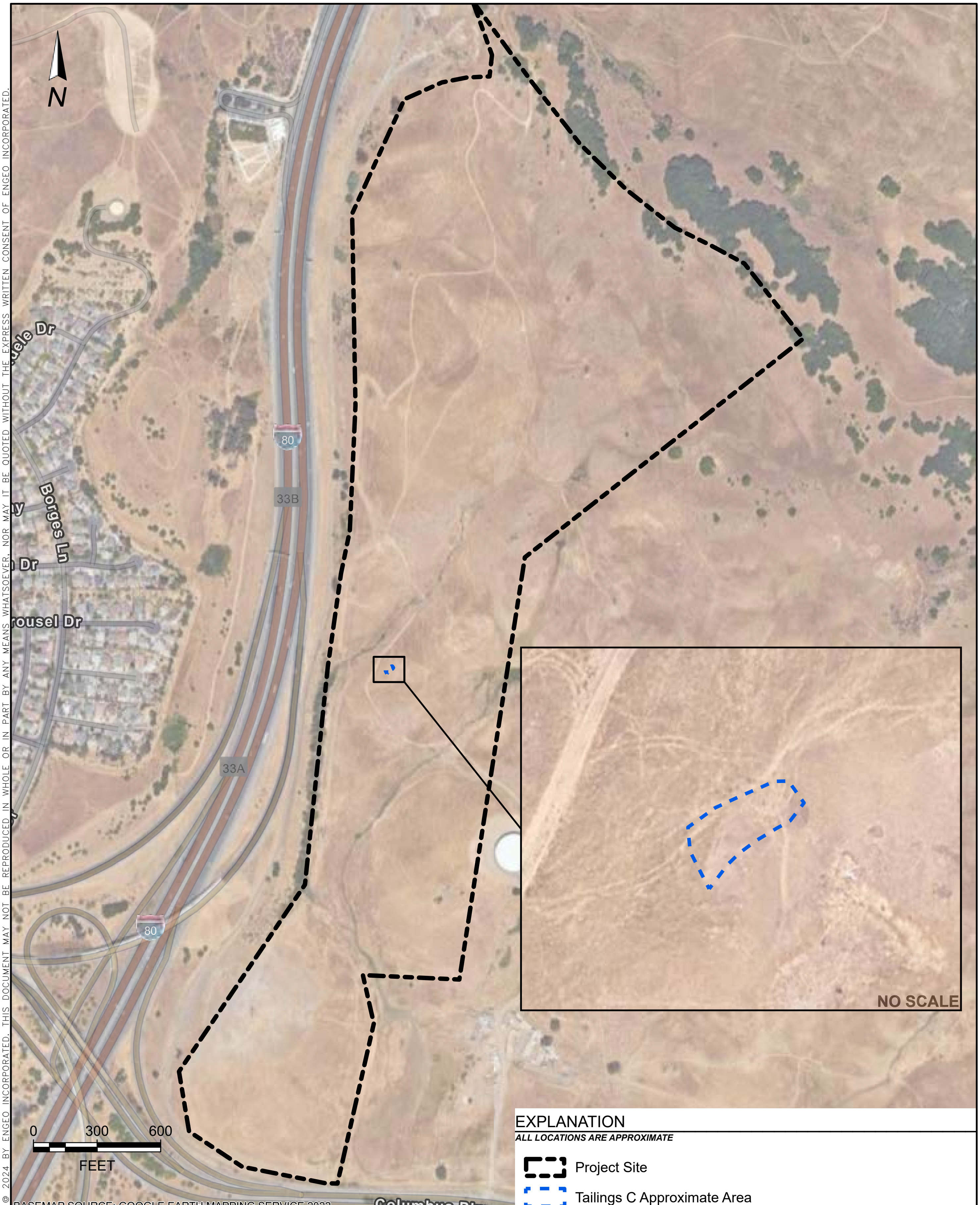
BASEMAP SOURCE: ENGEO INC, ESRI WORLD TOPO MAP

ENGEO Expect Excellence

VICINITY MAP VALLEJO SCOTTS VALLEY VALLEJO, CALIFORNIA	PROJECT NO.: 16484.001.001		FIGURE NO. 1
	SCALE: AS SHOWN		
	DRAWN BY: MMH	CHECKED BY: SPM	

ORIGINAL FIGURE PRINTED IN COLOR

PATH: G:\DRAFTING\PROJECTS_16000 TO 17999\16484\16484000001\SOIL_SAMPLING\16484000001_VALLEJO_SCOTTS_VALLEY.APRX
LAYOUT: 01. VICINITY 8.5 X 11 PORTRAIT USER: MHAWKINS



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

Project Site

Tailings C Approximate Area

ENGEO Expect Excellence

SITE PLAN

VALLEJO SCOTTS VALLEY

VALLEJO, CALIFORNIA

PROJECT NO. : 16484.001.001		FIGURE NO. 2
SCALE: AS SHOWN		
DRAWN BY: MMH	CHECKED BY: SPM	

ORIGINAL FIGURE PRINTED IN COLOR

PATH: G:\DRAFTING\PROJECTS_16000 TO 17999\16484\16484000001\SOIL_SAMPLING\16484000001_VALLEJO_SCOTTS_VALLEY.APRX
LAYOUT: 02. SITE PLAN 8.5 X 11 PORTRAIT USER: MHAWKINS

LABORATORY REPORTS

16484.001.001
July 1, 2024

McCampbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder:	2406324	**Amended:**	06/25/2024
		Revision:	1
Report Created for:	ENGEO Incorporated		
	2010 Crow Canyon Place, Ste 250 San Ramon, CA 94583-4634		
Project Contact:	Scott Johns		
Project P.O.:			
Project:	16484.001.001; Scotts Valley Development		
Project Location:			
Project Received:	06/05/2024		

Analytical Report reviewed & approved for release on 06/12/2024 by:

Jena Alfaro
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in a case narrative.

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Revision History

Client: ENGEO Incorporated **WorkOrder:** 2406324

Project: 16484.001.001; Scotts Valley Development

Date	Revision	Reason
06/25/2024	1	Revised to remove discrete metals and add composite metals in dry weight with percent moisture.

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Glossary of Terms & Qualifier Definitions

Client: ENGEO Incorporated **WorkOrder:** 2406324

Project: 16484.001.001; Scotts Valley Development

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
CCV	Continuing Calibration Verification.
CCV REC (%)	% recovery of Continuing Calibration Verification.
CPT	Consumer Product Testing not NELAP Accredited
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LCS2	Second LCS for the batch. Spike level is lower than that for the first LCS; applicable to method 1633.
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit [1]
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit [2]
RPD	Relative Percent Difference
RRT	Relative Retention Time
RSD	Relative Standard Deviation
SNR	Surrogate is diluted out of the calibration range
SPK Val	Spike Value

[1] MDL is the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results. Definition and Procedure for the Determination of the Method Detection Limit, Revision 2, 40CFR, Part 136, Appendix B, EPA 821-R-16-006, December 2016. Values are based upon our default extraction volume/amount and are subject to change.

[2] RL is the lowest level that can be reliably determined within specified limits of precision and accuracy during routine laboratory operating conditions. (The RL cannot be lower than the lowest calibration standard used in the initial calibration of the instrument and must be greater than the MDL.) Values are based upon our default extraction volume/amount and are subject to change.

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http://www.mccampbell.com / E-mail: main@mccampbell.com

Glossary of Terms & Qualifier Definitions

Client: ENGEO Incorporated **WorkOrder:** 2406324

Project: 16484.001.001; Scotts Valley Development

SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TNTC	“Too Numerous to Count;” greater than 250 colonies observed on the plate.
TZA	TimeZone Net Adjustment for sample collected outside of MAI's Coordinated Universal Time (UTC). (Adjustment for Daylight Saving is not accounted.)
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

Analytical Qualifiers

J	Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value.
e7	Oil range compounds are detected.

Quality Control Qualifiers

F1	MS/MSD recovery and/or RPD is out of acceptance criteria; LCS validates the prep batch.
F2	LCS/LCSD recovery and/or RPD/RSD is out of acceptance criteria.
F3	The surrogate standard recovery and/or RPD is outside of acceptance limits.

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8081B/8082A
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	**2406324-001A**	**Soil**	**06/05/2024 13:30**	**GC20 06072437.D**	**295213**

Analytes	Result	RL	DF	Date Analyzed
Aldrin	ND	0.0010	1	06/08/2024 01:53
a-BHC	ND	0.0010	1	06/08/2024 01:53
b-BHC	ND	0.0010	1	06/08/2024 01:53
d-BHC	ND	0.0010	1	06/08/2024 01:53
g-BHC	ND	0.0010	1	06/08/2024 01:53
Chlordane (Technical)	ND	0.025	1	06/08/2024 01:53
a-Chlordane	ND	0.0010	1	06/08/2024 01:53
g-Chlordane	ND	0.0010	1	06/08/2024 01:53
p,p-DDD	ND	0.0010	1	06/08/2024 01:53
p,p-DDE	ND	0.0010	1	06/08/2024 01:53
p,p-DDT	ND	0.0010	1	06/08/2024 01:53
Dieldrin	ND	0.0010	1	06/08/2024 01:53
Endosulfan I	ND	0.0010	1	06/08/2024 01:53
Endosulfan II	ND	0.0010	1	06/08/2024 01:53
Endosulfan sulfate	ND	0.0010	1	06/08/2024 01:53
Endrin	ND	0.0010	1	06/08/2024 01:53
Endrin aldehyde	ND	0.0010	1	06/08/2024 01:53
Endrin ketone	ND	0.0010	1	06/08/2024 01:53
Heptachlor	ND	0.0010	1	06/08/2024 01:53
Heptachlor epoxide	ND	0.0010	1	06/08/2024 01:53
Hexachlorobenzene	ND	0.010	1	06/08/2024 01:53
Hexachlorocyclopentadiene	ND	0.020	1	06/08/2024 01:53
Methoxychlor	ND	0.0010	1	06/08/2024 01:53
Toxaphene	ND	0.20	1	06/08/2024 01:53
Aroclor1016	ND	0.050	1	06/08/2024 01:53
Aroclor1221	ND	0.050	1	06/08/2024 01:53
Aroclor1232	ND	0.050	1	06/08/2024 01:53
Aroclor1242	ND	0.050	1	06/08/2024 01:53
Aroclor1248	ND	0.050	1	06/08/2024 01:53
Aroclor1254	ND	0.050	1	06/08/2024 01:53
Aroclor1260	ND	0.050	1	06/08/2024 01:53
PCBs, total	ND	0.050	1	06/08/2024 01:53

(Cont.)

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8081B/8082A
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	**2406324-001A**	**Soil**	**06/05/2024 13:30**	**GC20 06072437.D**	**295213**

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Decachlorobiphenyl	104	60-130		06/08/2024 01:53

Analyst(s): CK

(Cont.)

Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8081B/8082A
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	2406324-002A	Soil	06/05/2024 13:45	GC20 06072441.D	295213

Analytes	Result	RL	DF	Date Analyzed
Aldrin	ND	0.0010	1	06/08/2024 03:00
a-BHC	ND	0.0010	1	06/08/2024 03:00
b-BHC	ND	0.0010	1	06/08/2024 03:00
d-BHC	ND	0.0010	1	06/08/2024 03:00
g-BHC	ND	0.0010	1	06/08/2024 03:00
Chlordane (Technical)	ND	0.025	1	06/08/2024 03:00
a-Chlordane	ND	0.0010	1	06/08/2024 03:00
g-Chlordane	ND	0.0010	1	06/08/2024 03:00
p,p-DDD	ND	0.0010	1	06/08/2024 03:00
p,p-DDE	ND	0.0010	1	06/08/2024 03:00
p,p-DDT	ND	0.0010	1	06/08/2024 03:00
Dieldrin	ND	0.0010	1	06/08/2024 03:00
Endosulfan I	ND	0.0010	1	06/08/2024 03:00
Endosulfan II	ND	0.0010	1	06/08/2024 03:00
Endosulfan sulfate	ND	0.0010	1	06/08/2024 03:00
Endrin	ND	0.0010	1	06/08/2024 03:00
Endrin aldehyde	ND	0.0010	1	06/08/2024 03:00
Endrin ketone	ND	0.0010	1	06/08/2024 03:00
Heptachlor	ND	0.0010	1	06/08/2024 03:00
Heptachlor epoxide	ND	0.0010	1	06/08/2024 03:00
Hexachlorobenzene	ND	0.010	1	06/08/2024 03:00
Hexachlorocyclopentadiene	ND	0.020	1	06/08/2024 03:00
Methoxychlor	ND	0.0010	1	06/08/2024 03:00
Toxaphene	ND	0.20	1	06/08/2024 03:00
Aroclor1016	ND	0.050	1	06/08/2024 03:00
Aroclor1221	ND	0.050	1	06/08/2024 03:00
Aroclor1232	ND	0.050	1	06/08/2024 03:00
Aroclor1242	ND	0.050	1	06/08/2024 03:00
Aroclor1248	ND	0.050	1	06/08/2024 03:00
Aroclor1254	ND	0.050	1	06/08/2024 03:00
Aroclor1260	ND	0.050	1	06/08/2024 03:00
PCBs, total	ND	0.050	1	06/08/2024 03:00

(Cont.)

Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8081B/8082A
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	2406324-002A	Soil	06/05/2024 13:45	GC20 06072441.D	295213

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Decachlorobiphenyl	85	60-130		06/08/2024 03:00

Analyst(s): CK

(Cont.)

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8081B/8082A
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	2406324-003A	Soil	06/05/2024 14:02	GC20 06072449.D	295213

Analytes	Result	RL	DF	Date Analyzed
Aldrin	ND	0.0010	1	06/08/2024 05:12
a-BHC	ND	0.0010	1	06/08/2024 05:12
b-BHC	ND	0.0010	1	06/08/2024 05:12
d-BHC	ND	0.0010	1	06/08/2024 05:12
g-BHC	ND	0.0010	1	06/08/2024 05:12
Chlordane (Technical)	ND	0.025	1	06/08/2024 05:12
a-Chlordane	ND	0.0010	1	06/08/2024 05:12
g-Chlordane	ND	0.0010	1	06/08/2024 05:12
p,p-DDD	ND	0.0010	1	06/08/2024 05:12
p,p-DDE	ND	0.0010	1	06/08/2024 05:12
p,p-DDT	ND	0.0010	1	06/08/2024 05:12
Dieldrin	ND	0.0010	1	06/08/2024 05:12
Endosulfan I	ND	0.0010	1	06/08/2024 05:12
Endosulfan II	ND	0.0010	1	06/08/2024 05:12
Endosulfan sulfate	ND	0.0010	1	06/08/2024 05:12
Endrin	ND	0.0010	1	06/08/2024 05:12
Endrin aldehyde	ND	0.0010	1	06/08/2024 05:12
Endrin ketone	ND	0.0010	1	06/08/2024 05:12
Heptachlor	ND	0.0010	1	06/08/2024 05:12
Heptachlor epoxide	ND	0.0010	1	06/08/2024 05:12
Hexachlorobenzene	ND	0.010	1	06/08/2024 05:12
Hexachlorocyclopentadiene	ND	0.020	1	06/08/2024 05:12
Methoxychlor	ND	0.0010	1	06/08/2024 05:12
Toxaphene	ND	0.20	1	06/08/2024 05:12
Aroclor1016	ND	0.050	1	06/08/2024 05:12
Aroclor1221	ND	0.050	1	06/08/2024 05:12
Aroclor1232	ND	0.050	1	06/08/2024 05:12
Aroclor1242	ND	0.050	1	06/08/2024 05:12
Aroclor1248	ND	0.050	1	06/08/2024 05:12
Aroclor1254	ND	0.050	1	06/08/2024 05:12
Aroclor1260	ND	0.050	1	06/08/2024 05:12
PCBs, total	ND	0.050	1	06/08/2024 05:12

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8081B/8082A
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	**2406324-003A**	**Soil**	**06/05/2024 14:02**	**GC20 06072449.D**	**295213**

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Decachlorobiphenyl	83	60-130		06/08/2024 05:12

Analyst(s): CK

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8081B/8082A
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	2406324-004A	Soil	06/05/2024 14:14	GC20 06072442.D	295213

Analytes	Result	RL	DF	Date Analyzed
Aldrin	ND	0.0010	1	06/08/2024 03:16
a-BHC	ND	0.0010	1	06/08/2024 03:16
b-BHC	ND	0.0010	1	06/08/2024 03:16
d-BHC	ND	0.0010	1	06/08/2024 03:16
g-BHC	ND	0.0010	1	06/08/2024 03:16
Chlordane (Technical)	ND	0.025	1	06/08/2024 03:16
a-Chlordane	ND	0.0010	1	06/08/2024 03:16
g-Chlordane	ND	0.0010	1	06/08/2024 03:16
p,p-DDD	ND	0.0010	1	06/08/2024 03:16
p,p-DDE	ND	0.0010	1	06/08/2024 03:16
p,p-DDT	ND	0.0010	1	06/08/2024 03:16
Dieldrin	ND	0.0010	1	06/08/2024 03:16
Endosulfan I	ND	0.0010	1	06/08/2024 03:16
Endosulfan II	ND	0.0010	1	06/08/2024 03:16
Endosulfan sulfate	ND	0.0010	1	06/08/2024 03:16
Endrin	ND	0.0010	1	06/08/2024 03:16
Endrin aldehyde	ND	0.0010	1	06/08/2024 03:16
Endrin ketone	ND	0.0010	1	06/08/2024 03:16
Heptachlor	ND	0.0010	1	06/08/2024 03:16
Heptachlor epoxide	ND	0.0010	1	06/08/2024 03:16
Hexachlorobenzene	ND	0.010	1	06/08/2024 03:16
Hexachlorocyclopentadiene	ND	0.020	1	06/08/2024 03:16
Methoxychlor	ND	0.0010	1	06/08/2024 03:16
Toxaphene	ND	0.20	1	06/08/2024 03:16
Aroclor1016	ND	0.050	1	06/08/2024 03:16
Aroclor1221	ND	0.050	1	06/08/2024 03:16
Aroclor1232	ND	0.050	1	06/08/2024 03:16
Aroclor1242	ND	0.050	1	06/08/2024 03:16
Aroclor1248	ND	0.050	1	06/08/2024 03:16
Aroclor1254	ND	0.050	1	06/08/2024 03:16
Aroclor1260	ND	0.050	1	06/08/2024 03:16
PCBs, total	ND	0.050	1	06/08/2024 03:16

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8081B/8082A
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	2406324-004A	Soil	06/05/2024 14:14	GC20 06072442.D	295213

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Decachlorobiphenyl	81	60-130		06/08/2024 03:16

Analyst(s): CK

Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

TPH(g)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	**2406324-001A**	**Soil**	**06/05/2024 13:30**	**GC38 06102409.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	0.25	1	06/10/2024 13:52

Surrogates	REC (%)	Limits	Date Analyzed
Dibromofluoromethane	94	70-140	06/10/2024 13:52
Benzene-D6	84	50-140	06/10/2024 13:52

Analyst(s): TW

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	**2406324-002A**	**Soil**	**06/05/2024 13:45**	**GC38 06102411.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	0.25	1	06/10/2024 15:08

Surrogates	REC (%)	Limits	Date Analyzed
Dibromofluoromethane	92	70-140	06/10/2024 15:08
Benzene-D6	87	50-140	06/10/2024 15:08

Analyst(s): TW

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	**2406324-003A**	**Soil**	**06/05/2024 14:02**	**GC38 06102412.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	0.25	1	06/10/2024 15:45

Surrogates	REC (%)	Limits	Date Analyzed
Dibromofluoromethane	93	70-140	06/10/2024 15:45
Benzene-D6	87	50-140	06/10/2024 15:45

Analyst(s): TW

(Cont.)

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

TPH(g)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	**2406324-004A**	**Soil**	**06/05/2024 14:14**	**GC38 06102413.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	0.25	1	06/10/2024 16:23

Surrogates	REC (%)	Limits	Date Analyzed
Dibromofluoromethane	93	70-140	06/10/2024 16:23
Benzene-D6	86	50-140	06/10/2024 16:23

Analyst(s): TW

Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	2406324-001A	Soil	06/05/2024 13:30	GC38 06102409.D	295160

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.20	1	06/10/2024 13:52
tert-Amyl methyl ether (TAME)	ND	0.0050	1	06/10/2024 13:52
Benzene	ND	0.0050	1	06/10/2024 13:52
Bromobenzene	ND	0.0050	1	06/10/2024 13:52
Bromochloromethane	ND	0.0050	1	06/10/2024 13:52
Bromodichloromethane	ND	0.0050	1	06/10/2024 13:52
Bromoform	ND	0.0050	1	06/10/2024 13:52
Bromomethane	ND	0.0050	1	06/10/2024 13:52
2-Butanone (MEK)	ND	0.10	1	06/10/2024 13:52
t-Butyl alcohol (TBA)	ND	0.050	1	06/10/2024 13:52
n-Butyl benzene	ND	0.0050	1	06/10/2024 13:52
sec-Butyl benzene	ND	0.0050	1	06/10/2024 13:52
tert-Butyl benzene	ND	0.0050	1	06/10/2024 13:52
Carbon Disulfide	ND	0.0050	1	06/10/2024 13:52
Carbon Tetrachloride	ND	0.0050	1	06/10/2024 13:52
Chlorobenzene	ND	0.0050	1	06/10/2024 13:52
Chloroethane	ND	0.0050	1	06/10/2024 13:52
Chloroform	ND	0.0050	1	06/10/2024 13:52
Chloromethane	ND	0.0050	1	06/10/2024 13:52
2-Chlorotoluene	ND	0.0050	1	06/10/2024 13:52
4-Chlorotoluene	ND	0.0050	1	06/10/2024 13:52
Dibromochloromethane	ND	0.0050	1	06/10/2024 13:52
1,2-Dibromo-3-chloropropane	ND	0.00050	1	06/10/2024 13:52
1,2-Dibromoethane (EDB)	ND	0.00025	1	06/10/2024 13:52
Dibromomethane	ND	0.0050	1	06/10/2024 13:52
1,2-Dichlorobenzene	ND	0.0050	1	06/10/2024 13:52
1,3-Dichlorobenzene	ND	0.0050	1	06/10/2024 13:52
1,4-Dichlorobenzene	ND	0.0050	1	06/10/2024 13:52
Dichlorodifluoromethane	ND	0.0050	1	06/10/2024 13:52
1,1-Dichloroethane	ND	0.0050	1	06/10/2024 13:52
1,2-Dichloroethane (1,2-DCA)	ND	0.00010	1	06/10/2024 13:52
1,1-Dichloroethene	ND	0.0050	1	06/10/2024 13:52
cis-1,2-Dichloroethene	ND	0.0050	1	06/10/2024 13:52
trans-1,2-Dichloroethene	ND	0.0050	1	06/10/2024 13:52
1,2-Dichloropropane	ND	0.0050	1	06/10/2024 13:52
1,3-Dichloropropane	ND	0.0050	1	06/10/2024 13:52

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	**2406324-001A**	**Soil**	**06/05/2024 13:30**	**GC38 06102409.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
2,2-Dichloropropane	ND	0.0050	1	06/10/2024 13:52
1,1-Dichloropropene	ND	0.0050	1	06/10/2024 13:52
cis-1,3-Dichloropropene	ND	0.0050	1	06/10/2024 13:52
trans-1,3-Dichloropropene	ND	0.0050	1	06/10/2024 13:52
Diisopropyl ether (DIPE)	ND	0.0050	1	06/10/2024 13:52
Ethylbenzene	ND	0.0050	1	06/10/2024 13:52
Ethyl tert-butyl ether (ETBE)	ND	0.0050	1	06/10/2024 13:52
Freon 113	ND	0.0050	1	06/10/2024 13:52
Hexachlorobutadiene	ND	0.0050	1	06/10/2024 13:52
Hexachloroethane	ND	0.0050	1	06/10/2024 13:52
2-Hexanone	ND	0.0050	1	06/10/2024 13:52
Isopropylbenzene	ND	0.0050	1	06/10/2024 13:52
4-Isopropyl toluene	ND	0.0050	1	06/10/2024 13:52
Methyl-t-butyl ether (MTBE)	ND	0.0050	1	06/10/2024 13:52
Methylene chloride	ND	0.020	1	06/10/2024 13:52
4-Methyl-2-pentanone (MIBK)	ND	0.0050	1	06/10/2024 13:52
Naphthalene	ND	0.0050	1	06/10/2024 13:52
n-Propyl benzene	ND	0.0050	1	06/10/2024 13:52
Styrene	ND	0.0050	1	06/10/2024 13:52
1,1,1,2-Tetrachloroethane	ND	0.0050	1	06/10/2024 13:52
1,1,2,2-Tetrachloroethane	ND	0.0050	1	06/10/2024 13:52
Tetrachloroethene	ND	0.0050	1	06/10/2024 13:52
Toluene	**0.013**	0.0050	1	06/10/2024 13:52
1,2,3-Trichlorobenzene	ND	0.0050	1	06/10/2024 13:52
1,2,4-Trichlorobenzene	ND	0.0050	1	06/10/2024 13:52
1,1,1-Trichloroethane	ND	0.0050	1	06/10/2024 13:52
1,1,2-Trichloroethane	ND	0.0050	1	06/10/2024 13:52
Trichloroethene	ND	0.0050	1	06/10/2024 13:52
Trichlorofluoromethane	ND	0.0050	1	06/10/2024 13:52
1,2,3-Trichloropropane	ND	0.00025	1	06/10/2024 13:52
1,2,4-Trimethylbenzene	ND	0.0050	1	06/10/2024 13:52
1,3,5-Trimethylbenzene	ND	0.0050	1	06/10/2024 13:52
Vinyl Chloride	ND	0.00025	1	06/10/2024 13:52
m,p-Xylene	ND	0.0050	1	06/10/2024 13:52
o-Xylene	ND	0.0050	1	06/10/2024 13:52
Xylenes, Total	ND	0.0050	1	06/10/2024 13:52

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	2406324-001A	Soil	06/05/2024 13:30	GC38 06102409.D	295160

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Dibromofluoromethane	100	70-140		06/10/2024 13:52
Toluene-d8	112	70-140		06/10/2024 13:52
4-BFB	119	70-140		06/10/2024 13:52
Benzene-d6	96	50-140		06/10/2024 13:52
Ethylbenzene-d10	110	50-140		06/10/2024 13:52
1,2-DCB-d4	85	40-140		06/10/2024 13:52

Analyst(s): TW

(Cont.)

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	2406324-002A	Soil	06/05/2024 13:45	GC38 06102411.D	295160

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.20	1	06/10/2024 15:08
tert-Amyl methyl ether (TAME)	ND	0.0050	1	06/10/2024 15:08
Benzene	ND	0.0050	1	06/10/2024 15:08
Bromobenzene	ND	0.0050	1	06/10/2024 15:08
Bromochloromethane	ND	0.0050	1	06/10/2024 15:08
Bromodichloromethane	ND	0.0050	1	06/10/2024 15:08
Bromoform	ND	0.0050	1	06/10/2024 15:08
Bromomethane	ND	0.0050	1	06/10/2024 15:08
2-Butanone (MEK)	ND	0.10	1	06/10/2024 15:08
t-Butyl alcohol (TBA)	ND	0.050	1	06/10/2024 15:08
n-Butyl benzene	ND	0.0050	1	06/10/2024 15:08
sec-Butyl benzene	ND	0.0050	1	06/10/2024 15:08
tert-Butyl benzene	ND	0.0050	1	06/10/2024 15:08
Carbon Disulfide	ND	0.0050	1	06/10/2024 15:08
Carbon Tetrachloride	ND	0.0050	1	06/10/2024 15:08
Chlorobenzene	ND	0.0050	1	06/10/2024 15:08
Chloroethane	ND	0.0050	1	06/10/2024 15:08
Chloroform	ND	0.0050	1	06/10/2024 15:08
Chloromethane	ND	0.0050	1	06/10/2024 15:08
2-Chlorotoluene	ND	0.0050	1	06/10/2024 15:08
4-Chlorotoluene	ND	0.0050	1	06/10/2024 15:08
Dibromochloromethane	ND	0.0050	1	06/10/2024 15:08
1,2-Dibromo-3-chloropropane	ND	0.00050	1	06/10/2024 15:08
1,2-Dibromoethane (EDB)	ND	0.00025	1	06/10/2024 15:08
Dibromomethane	ND	0.0050	1	06/10/2024 15:08
1,2-Dichlorobenzene	ND	0.0050	1	06/10/2024 15:08
1,3-Dichlorobenzene	ND	0.0050	1	06/10/2024 15:08
1,4-Dichlorobenzene	ND	0.0050	1	06/10/2024 15:08
Dichlorodifluoromethane	ND	0.0050	1	06/10/2024 15:08
1,1-Dichloroethane	ND	0.0050	1	06/10/2024 15:08
1,2-Dichloroethane (1,2-DCA)	ND	0.00010	1	06/10/2024 15:08
1,1-Dichloroethene	ND	0.0050	1	06/10/2024 15:08
cis-1,2-Dichloroethene	ND	0.0050	1	06/10/2024 15:08
trans-1,2-Dichloroethene	ND	0.0050	1	06/10/2024 15:08
1,2-Dichloropropane	ND	0.0050	1	06/10/2024 15:08
1,3-Dichloropropane	ND	0.0050	1	06/10/2024 15:08

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	2406324-002A	Soil	06/05/2024 13:45	GC38 06102411.D	295160

Analytes	Result	RL	DF	Date Analyzed
2,2-Dichloropropane	ND	0.0050	1	06/10/2024 15:08
1,1-Dichloropropene	ND	0.0050	1	06/10/2024 15:08
cis-1,3-Dichloropropene	ND	0.0050	1	06/10/2024 15:08
trans-1,3-Dichloropropene	ND	0.0050	1	06/10/2024 15:08
Diisopropyl ether (DIPE)	ND	0.0050	1	06/10/2024 15:08
Ethylbenzene	ND	0.0050	1	06/10/2024 15:08
Ethyl tert-butyl ether (ETBE)	ND	0.0050	1	06/10/2024 15:08
Freon 113	ND	0.0050	1	06/10/2024 15:08
Hexachlorobutadiene	ND	0.0050	1	06/10/2024 15:08
Hexachloroethane	ND	0.0050	1	06/10/2024 15:08
2-Hexanone	ND	0.0050	1	06/10/2024 15:08
Isopropylbenzene	ND	0.0050	1	06/10/2024 15:08
4-Isopropyl toluene	ND	0.0050	1	06/10/2024 15:08
Methyl-t-butyl ether (MTBE)	ND	0.0050	1	06/10/2024 15:08
Methylene chloride	ND	0.020	1	06/10/2024 15:08
4-Methyl-2-pentanone (MIBK)	ND	0.0050	1	06/10/2024 15:08
Naphthalene	ND	0.0050	1	06/10/2024 15:08
n-Propyl benzene	ND	0.0050	1	06/10/2024 15:08
Styrene	ND	0.0050	1	06/10/2024 15:08
1,1,1,2-Tetrachloroethane	ND	0.0050	1	06/10/2024 15:08
1,1,2,2-Tetrachloroethane	ND	0.0050	1	06/10/2024 15:08
Tetrachloroethene	ND	0.0050	1	06/10/2024 15:08
Toluene	**0.0070**	0.0050	1	06/10/2024 15:08
1,2,3-Trichlorobenzene	ND	0.0050	1	06/10/2024 15:08
1,2,4-Trichlorobenzene	ND	0.0050	1	06/10/2024 15:08
1,1,1-Trichloroethane	ND	0.0050	1	06/10/2024 15:08
1,1,2-Trichloroethane	ND	0.0050	1	06/10/2024 15:08
Trichloroethene	ND	0.0050	1	06/10/2024 15:08
Trichlorofluoromethane	ND	0.0050	1	06/10/2024 15:08
1,2,3-Trichloropropane	ND	0.00025	1	06/10/2024 15:08
1,2,4-Trimethylbenzene	ND	0.0050	1	06/10/2024 15:08
1,3,5-Trimethylbenzene	ND	0.0050	1	06/10/2024 15:08
Vinyl Chloride	ND	0.00025	1	06/10/2024 15:08
m,p-Xylene	ND	0.0050	1	06/10/2024 15:08
o-Xylene	ND	0.0050	1	06/10/2024 15:08
Xylenes, Total	ND	0.0050	1	06/10/2024 15:08

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	**2406324-002A**	**Soil**	**06/05/2024 13:45**	**GC38 06102411.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Dibromofluoromethane	100	70-140		06/10/2024 15:08
Toluene-d8	112	70-140		06/10/2024 15:08
4-BFB	118	70-140		06/10/2024 15:08
Benzene-d6	102	50-140		06/10/2024 15:08
Ethylbenzene-d10	114	50-140		06/10/2024 15:08
1,2-DCB-d4	84	40-140		06/10/2024 15:08

Analyst(s): TW

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	2406324-003A	Soil	06/05/2024 14:02	GC38 06102412.D	295160

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.20	1	06/10/2024 15:45
tert-Amyl methyl ether (TAME)	ND	0.0050	1	06/10/2024 15:45
Benzene	ND	0.0050	1	06/10/2024 15:45
Bromobenzene	ND	0.0050	1	06/10/2024 15:45
Bromochloromethane	ND	0.0050	1	06/10/2024 15:45
Bromodichloromethane	ND	0.0050	1	06/10/2024 15:45
Bromoform	ND	0.0050	1	06/10/2024 15:45
Bromomethane	ND	0.0050	1	06/10/2024 15:45
2-Butanone (MEK)	ND	0.10	1	06/10/2024 15:45
t-Butyl alcohol (TBA)	ND	0.050	1	06/10/2024 15:45
n-Butyl benzene	ND	0.0050	1	06/10/2024 15:45
sec-Butyl benzene	ND	0.0050	1	06/10/2024 15:45
tert-Butyl benzene	ND	0.0050	1	06/10/2024 15:45
Carbon Disulfide	ND	0.0050	1	06/10/2024 15:45
Carbon Tetrachloride	ND	0.0050	1	06/10/2024 15:45
Chlorobenzene	ND	0.0050	1	06/10/2024 15:45
Chloroethane	ND	0.0050	1	06/10/2024 15:45
Chloroform	ND	0.0050	1	06/10/2024 15:45
Chloromethane	ND	0.0050	1	06/10/2024 15:45
2-Chlorotoluene	ND	0.0050	1	06/10/2024 15:45
4-Chlorotoluene	ND	0.0050	1	06/10/2024 15:45
Dibromochloromethane	ND	0.0050	1	06/10/2024 15:45
1,2-Dibromo-3-chloropropane	ND	0.00050	1	06/10/2024 15:45
1,2-Dibromoethane (EDB)	ND	0.00025	1	06/10/2024 15:45
Dibromomethane	ND	0.0050	1	06/10/2024 15:45
1,2-Dichlorobenzene	ND	0.0050	1	06/10/2024 15:45
1,3-Dichlorobenzene	ND	0.0050	1	06/10/2024 15:45
1,4-Dichlorobenzene	ND	0.0050	1	06/10/2024 15:45
Dichlorodifluoromethane	ND	0.0050	1	06/10/2024 15:45
1,1-Dichloroethane	ND	0.0050	1	06/10/2024 15:45
1,2-Dichloroethane (1,2-DCA)	ND	0.00010	1	06/10/2024 15:45
1,1-Dichloroethene	ND	0.0050	1	06/10/2024 15:45
cis-1,2-Dichloroethene	ND	0.0050	1	06/10/2024 15:45
trans-1,2-Dichloroethene	ND	0.0050	1	06/10/2024 15:45
1,2-Dichloropropane	ND	0.0050	1	06/10/2024 15:45
1,3-Dichloropropane	ND	0.0050	1	06/10/2024 15:45

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	2406324-003A	Soil	06/05/2024 14:02	GC38 06102412.D	295160

Analytes	Result	RL	DF	Date Analyzed
2,2-Dichloropropane	ND	0.0050	1	06/10/2024 15:45
1,1-Dichloropropene	ND	0.0050	1	06/10/2024 15:45
cis-1,3-Dichloropropene	ND	0.0050	1	06/10/2024 15:45
trans-1,3-Dichloropropene	ND	0.0050	1	06/10/2024 15:45
Diisopropyl ether (DIPE)	ND	0.0050	1	06/10/2024 15:45
Ethylbenzene	ND	0.0050	1	06/10/2024 15:45
Ethyl tert-butyl ether (ETBE)	ND	0.0050	1	06/10/2024 15:45
Freon 113	ND	0.0050	1	06/10/2024 15:45
Hexachlorobutadiene	ND	0.0050	1	06/10/2024 15:45
Hexachloroethane	ND	0.0050	1	06/10/2024 15:45
2-Hexanone	ND	0.0050	1	06/10/2024 15:45
Isopropylbenzene	ND	0.0050	1	06/10/2024 15:45
4-Isopropyl toluene	ND	0.0050	1	06/10/2024 15:45
Methyl-t-butyl ether (MTBE)	ND	0.0050	1	06/10/2024 15:45
Methylene chloride	ND	0.020	1	06/10/2024 15:45
4-Methyl-2-pentanone (MIBK)	ND	0.0050	1	06/10/2024 15:45
Naphthalene	ND	0.0050	1	06/10/2024 15:45
n-Propyl benzene	ND	0.0050	1	06/10/2024 15:45
Styrene	ND	0.0050	1	06/10/2024 15:45
1,1,1,2-Tetrachloroethane	ND	0.0050	1	06/10/2024 15:45
1,1,2,2-Tetrachloroethane	ND	0.0050	1	06/10/2024 15:45
Tetrachloroethene	ND	0.0050	1	06/10/2024 15:45
Toluene	ND	0.0050	1	06/10/2024 15:45
1,2,3-Trichlorobenzene	ND	0.0050	1	06/10/2024 15:45
1,2,4-Trichlorobenzene	ND	0.0050	1	06/10/2024 15:45
1,1,1-Trichloroethane	ND	0.0050	1	06/10/2024 15:45
1,1,2-Trichloroethane	ND	0.0050	1	06/10/2024 15:45
Trichloroethene	ND	0.0050	1	06/10/2024 15:45
Trichlorofluoromethane	ND	0.0050	1	06/10/2024 15:45
1,2,3-Trichloropropane	ND	0.00025	1	06/10/2024 15:45
1,2,4-Trimethylbenzene	ND	0.0050	1	06/10/2024 15:45
1,3,5-Trimethylbenzene	ND	0.0050	1	06/10/2024 15:45
Vinyl Chloride	ND	0.00025	1	06/10/2024 15:45
m,p-Xylene	ND	0.0050	1	06/10/2024 15:45
o-Xylene	ND	0.0050	1	06/10/2024 15:45
Xylenes, Total	ND	0.0050	1	06/10/2024 15:45

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	**2406324-003A**	**Soil**	**06/05/2024 14:02**	**GC38 06102412.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Dibromofluoromethane	104	70-140		06/10/2024 15:45
Toluene-d8	112	70-140		06/10/2024 15:45
4-BFB	113	70-140		06/10/2024 15:45
Benzene-d6	109	50-140		06/10/2024 15:45
Ethylbenzene-d10	115	50-140		06/10/2024 15:45
1,2-DCB-d4	85	40-140		06/10/2024 15:45

Analyst(s): TW

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	2406324-004A	Soil	06/05/2024 14:14	GC38 06102413.D	295160

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.20	1	06/10/2024 16:23
tert-Amyl methyl ether (TAME)	ND	0.0050	1	06/10/2024 16:23
Benzene	ND	0.0050	1	06/10/2024 16:23
Bromobenzene	ND	0.0050	1	06/10/2024 16:23
Bromochloromethane	ND	0.0050	1	06/10/2024 16:23
Bromodichloromethane	ND	0.0050	1	06/10/2024 16:23
Bromoform	ND	0.0050	1	06/10/2024 16:23
Bromomethane	ND	0.0050	1	06/10/2024 16:23
2-Butanone (MEK)	ND	0.10	1	06/10/2024 16:23
t-Butyl alcohol (TBA)	ND	0.050	1	06/10/2024 16:23
n-Butyl benzene	ND	0.0050	1	06/10/2024 16:23
sec-Butyl benzene	ND	0.0050	1	06/10/2024 16:23
tert-Butyl benzene	ND	0.0050	1	06/10/2024 16:23
Carbon Disulfide	ND	0.0050	1	06/10/2024 16:23
Carbon Tetrachloride	ND	0.0050	1	06/10/2024 16:23
Chlorobenzene	ND	0.0050	1	06/10/2024 16:23
Chloroethane	ND	0.0050	1	06/10/2024 16:23
Chloroform	ND	0.0050	1	06/10/2024 16:23
Chloromethane	ND	0.0050	1	06/10/2024 16:23
2-Chlorotoluene	ND	0.0050	1	06/10/2024 16:23
4-Chlorotoluene	ND	0.0050	1	06/10/2024 16:23
Dibromochloromethane	ND	0.0050	1	06/10/2024 16:23
1,2-Dibromo-3-chloropropane	ND	0.00050	1	06/10/2024 16:23
1,2-Dibromoethane (EDB)	ND	0.00025	1	06/10/2024 16:23
Dibromomethane	ND	0.0050	1	06/10/2024 16:23
1,2-Dichlorobenzene	ND	0.0050	1	06/10/2024 16:23
1,3-Dichlorobenzene	ND	0.0050	1	06/10/2024 16:23
1,4-Dichlorobenzene	ND	0.0050	1	06/10/2024 16:23
Dichlorodifluoromethane	ND	0.0050	1	06/10/2024 16:23
1,1-Dichloroethane	ND	0.0050	1	06/10/2024 16:23
1,2-Dichloroethane (1,2-DCA)	ND	0.00010	1	06/10/2024 16:23
1,1-Dichloroethene	ND	0.0050	1	06/10/2024 16:23
cis-1,2-Dichloroethene	ND	0.0050	1	06/10/2024 16:23
trans-1,2-Dichloroethene	ND	0.0050	1	06/10/2024 16:23
1,2-Dichloropropane	ND	0.0050	1	06/10/2024 16:23
1,3-Dichloropropane	ND	0.0050	1	06/10/2024 16:23

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	**2406324-004A**	**Soil**	**06/05/2024 14:14**	**GC38 06102413.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
2,2-Dichloropropane	ND	0.0050	1	06/10/2024 16:23
1,1-Dichloropropene	ND	0.0050	1	06/10/2024 16:23
cis-1,3-Dichloropropene	ND	0.0050	1	06/10/2024 16:23
trans-1,3-Dichloropropene	ND	0.0050	1	06/10/2024 16:23
Diisopropyl ether (DIPE)	ND	0.0050	1	06/10/2024 16:23
Ethylbenzene	ND	0.0050	1	06/10/2024 16:23
Ethyl tert-butyl ether (ETBE)	ND	0.0050	1	06/10/2024 16:23
Freon 113	ND	0.0050	1	06/10/2024 16:23
Hexachlorobutadiene	ND	0.0050	1	06/10/2024 16:23
Hexachloroethane	ND	0.0050	1	06/10/2024 16:23
2-Hexanone	ND	0.0050	1	06/10/2024 16:23
Isopropylbenzene	ND	0.0050	1	06/10/2024 16:23
4-Isopropyl toluene	ND	0.0050	1	06/10/2024 16:23
Methyl-t-butyl ether (MTBE)	ND	0.0050	1	06/10/2024 16:23
Methylene chloride	ND	0.020	1	06/10/2024 16:23
4-Methyl-2-pentanone (MIBK)	ND	0.0050	1	06/10/2024 16:23
Naphthalene	ND	0.0050	1	06/10/2024 16:23
n-Propyl benzene	ND	0.0050	1	06/10/2024 16:23
Styrene	ND	0.0050	1	06/10/2024 16:23
1,1,1,2-Tetrachloroethane	ND	0.0050	1	06/10/2024 16:23
1,1,2,2-Tetrachloroethane	ND	0.0050	1	06/10/2024 16:23
Tetrachloroethene	ND	0.0050	1	06/10/2024 16:23
Toluene	**0.0096**	0.0050	1	06/10/2024 16:23
1,2,3-Trichlorobenzene	ND	0.0050	1	06/10/2024 16:23
1,2,4-Trichlorobenzene	ND	0.0050	1	06/10/2024 16:23
1,1,1-Trichloroethane	ND	0.0050	1	06/10/2024 16:23
1,1,2-Trichloroethane	ND	0.0050	1	06/10/2024 16:23
Trichloroethene	ND	0.0050	1	06/10/2024 16:23
Trichlorofluoromethane	ND	0.0050	1	06/10/2024 16:23
1,2,3-Trichloropropane	ND	0.00025	1	06/10/2024 16:23
1,2,4-Trimethylbenzene	ND	0.0050	1	06/10/2024 16:23
1,3,5-Trimethylbenzene	ND	0.0050	1	06/10/2024 16:23
Vinyl Chloride	ND	0.00025	1	06/10/2024 16:23
m,p-Xylene	ND	0.0050	1	06/10/2024 16:23
o-Xylene	ND	0.0050	1	06/10/2024 16:23
Xylenes, Total	ND	0.0050	1	06/10/2024 16:23

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW5030B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8260D
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	**2406324-004A**	**Soil**	**06/05/2024 14:14**	**GC38 06102413.D**	**295160**

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Dibromofluoromethane	96	70-140		06/10/2024 16:23
Toluene-d8	112	70-140		06/10/2024 16:23
4-BFB	114	70-140		06/10/2024 16:23
Benzene-d6	99	50-140		06/10/2024 16:23
Ethylbenzene-d10	113	50-140		06/10/2024 16:23
1,2-DCB-d4	85	40-140		06/10/2024 16:23

Analyst(s): TW

McCampbell Analytical, Inc.
"When Quality Counts"
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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	2406324-001A	Soil	06/05/2024 13:30	GC21 06112418.D	295353

Analytes	Result	RL	DF	Date Analyzed
Acenaphthene	ND	0.0013	1	06/11/2024 14:28
Acenaphthylene	ND	0.0013	1	06/11/2024 14:28
Acetochlor	ND	0.25	1	06/11/2024 14:28
Anthracene	ND	0.0013	1	06/11/2024 14:28
Benzidine	ND	1.2	1	06/11/2024 14:28
Benzo (a) anthracene	ND	0.012	1	06/11/2024 14:28
Benzo (a) pyrene	ND	0.0013	1	06/11/2024 14:28
Benzo (b) fluoranthene	ND	0.0025	1	06/11/2024 14:28
Benzo (g,h,i) perylene	ND	0.0025	1	06/11/2024 14:28
Benzo (k) fluoranthene	ND	0.0025	1	06/11/2024 14:28
Benzoic Acid	ND	1.2	1	06/11/2024 14:28
Benzyl Alcohol	ND	1.2	1	06/11/2024 14:28
1,1-Biphenyl	ND	0.012	1	06/11/2024 14:28
Bis (2-chloroethoxy) Methane	ND	0.25	1	06/11/2024 14:28
Bis (2-chloroethyl) Ether	ND	0.0013	1	06/11/2024 14:28
Bis (2-chloroisopropyl) Ether	ND	0.0025	1	06/11/2024 14:28
Bis (2-ethylhexyl) Adipate	ND	0.25	1	06/11/2024 14:28
Bis (2-ethylhexyl) Phthalate	ND	0.062	1	06/11/2024 14:28
4-Bromophenyl Phenyl Ether	ND	0.25	1	06/11/2024 14:28
Butylbenzyl Phthalate	ND	0.062	1	06/11/2024 14:28
4-Chloroaniline	ND	0.0013	1	06/11/2024 14:28
4-Chloro-3-methylphenol	ND	0.25	1	06/11/2024 14:28
2-Chloronaphthalene	ND	0.25	1	06/11/2024 14:28
2-Chlorophenol	ND	0.012	1	06/11/2024 14:28
4-Chlorophenyl Phenyl Ether	ND	0.25	1	06/11/2024 14:28
Chrysene	ND	0.0013	1	06/11/2024 14:28
Dibenzo (a,h) anthracene	ND	0.0025	1	06/11/2024 14:28
Dibenzofuran	ND	0.0013	1	06/11/2024 14:28
Di-n-butyl Phthalate	ND	0.062	1	06/11/2024 14:28
1,2-Dichlorobenzene	ND	0.25	1	06/11/2024 14:28
1,3-Dichlorobenzene	ND	0.25	1	06/11/2024 14:28
1,4-Dichlorobenzene	ND	0.25	1	06/11/2024 14:28
3,3-Dichlorobenzidine	ND	0.0013	1	06/11/2024 14:28
2,4-Dichlorophenol	ND	0.0025	1	06/11/2024 14:28
2,6-Dichlorophenol	ND	0.012	1	06/11/2024 14:28
Diethyl Phthalate	ND	0.012	1	06/11/2024 14:28

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	2406324-001A	Soil	06/05/2024 13:30	GC21 06112418.D	295353

Analytes	Result	RL	DF	Date Analyzed
2,4-Dimethylphenol	ND	0.25	1	06/11/2024 14:28
Dimethyl Phthalate	ND	0.0025	1	06/11/2024 14:28
4,6-Dinitro-2-methylphenol	ND	1.2	1	06/11/2024 14:28
2,4-Dinitrophenol	ND	0.25	1	06/11/2024 14:28
2,4-Dinitrotoluene	ND	0.012	1	06/11/2024 14:28
2,6-Dinitrotoluene	ND	0.012	1	06/11/2024 14:28
Di-n-octyl Phthalate	ND	0.62	1	06/11/2024 14:28
1,2-Diphenylhydrazine	ND	0.25	1	06/11/2024 14:28
Fluoranthene	ND	0.0025	1	06/11/2024 14:28
Fluorene	ND	0.0025	1	06/11/2024 14:28
Hexachlorobenzene	ND	0.0013	1	06/11/2024 14:28
Hexachlorobutadiene	ND	0.0013	1	06/11/2024 14:28
Hexachlorocyclopentadiene	ND	1.2	1	06/11/2024 14:28
Hexachloroethane	ND	0.0025	1	06/11/2024 14:28
Indeno (1,2,3-cd) pyrene	ND	0.0025	1	06/11/2024 14:28
Isophorone	ND	0.25	1	06/11/2024 14:28
1-Methylnaphthalene	ND	0.0013	1	06/11/2024 14:28
2-Methylnaphthalene	ND	0.0013	1	06/11/2024 14:28
2-Methylphenol (o-Cresol)	ND	0.25	1	06/11/2024 14:28
3 & 4-Methylphenol (m,p-Cresol)	ND	0.25	1	06/11/2024 14:28
Naphthalene	ND	0.0025	1	06/11/2024 14:28
2-Nitroaniline	ND	1.2	1	06/11/2024 14:28
3-Nitroaniline	ND	1.2	1	06/11/2024 14:28
4-Nitroaniline	ND	1.2	1	06/11/2024 14:28
Nitrobenzene	ND	0.25	1	06/11/2024 14:28
2-Nitrophenol	ND	1.2	1	06/11/2024 14:28
4-Nitrophenol	ND	1.2	1	06/11/2024 14:28
N-Nitrosodiphenylamine	ND	0.25	1	06/11/2024 14:28
N-Nitrosodi-n-propylamine	ND	0.25	1	06/11/2024 14:28
Pentachlorophenol	ND	0.062	1	06/11/2024 14:28
Phenanthrene	ND	0.0013	1	06/11/2024 14:28
Phenol	ND	0.010	1	06/11/2024 14:28
Pyrene	ND	0.0013	1	06/11/2024 14:28
Pyridine	ND	0.25	1	06/11/2024 14:28
1,2,4-Trichlorobenzene	ND	0.25	1	06/11/2024 14:28
2,4,5-Trichlorophenol	ND	0.0025	1	06/11/2024 14:28

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	**2406324-001A**	**Soil**	**06/05/2024 13:30**	**GC21 06112418.D**	**295353**

Analytes	Result	RL	DF	Date Analyzed
2,4,6-Trichlorophenol	ND	0.0025	1	06/11/2024 14:28
N-Nitrosodimethylamine	ND	1.2	1	06/11/2024 14:28
2,3,4,6-Tetrachlorophenol	ND	0.25	1	06/11/2024 14:28

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorophenol	96	60-130	06/11/2024 14:28
Phenol-d5	90	50-130	06/11/2024 14:28
Nitrobenzene-d5	88	60-130	06/11/2024 14:28
2-Fluorobiphenyl	89	60-130	06/11/2024 14:28
2,4,6-Tribromophenol	74	50-130	06/11/2024 14:28
4-Terphenyl-d14	101	50-130	06/11/2024 14:28

Analyst(s): MV

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	2406324-002A	Soil	06/05/2024 13:45	GC21 06112419.D	295353

Analytes	Result	RL	DF	Date Analyzed
Acenaphthene	ND	0.0013	1	06/11/2024 14:57
Acenaphthylene	ND	0.0013	1	06/11/2024 14:57
Acetochlor	ND	0.25	1	06/11/2024 14:57
Anthracene	ND	0.0013	1	06/11/2024 14:57
Benzidine	ND	1.2	1	06/11/2024 14:57
Benzo (a) anthracene	ND	0.012	1	06/11/2024 14:57
Benzo (a) pyrene	ND	0.0013	1	06/11/2024 14:57
Benzo (b) fluoranthene	ND	0.0025	1	06/11/2024 14:57
Benzo (g,h,i) perylene	ND	0.0025	1	06/11/2024 14:57
Benzo (k) fluoranthene	ND	0.0025	1	06/11/2024 14:57
Benzoic Acid	ND	1.2	1	06/11/2024 14:57
Benzyl Alcohol	ND	1.2	1	06/11/2024 14:57
1,1-Biphenyl	ND	0.012	1	06/11/2024 14:57
Bis (2-chloroethoxy) Methane	ND	0.25	1	06/11/2024 14:57
Bis (2-chloroethyl) Ether	ND	0.0013	1	06/11/2024 14:57
Bis (2-chloroisopropyl) Ether	ND	0.0025	1	06/11/2024 14:57
Bis (2-ethylhexyl) Adipate	ND	0.25	1	06/11/2024 14:57
Bis (2-ethylhexyl) Phthalate	ND	0.062	1	06/11/2024 14:57
4-Bromophenyl Phenyl Ether	ND	0.25	1	06/11/2024 14:57
Butylbenzyl Phthalate	ND	0.062	1	06/11/2024 14:57
4-Chloroaniline	ND	0.0013	1	06/11/2024 14:57
4-Chloro-3-methylphenol	ND	0.25	1	06/11/2024 14:57
2-Chloronaphthalene	ND	0.25	1	06/11/2024 14:57
2-Chlorophenol	ND	0.012	1	06/11/2024 14:57
4-Chlorophenyl Phenyl Ether	ND	0.25	1	06/11/2024 14:57
Chrysene	ND	0.0013	1	06/11/2024 14:57
Dibenzo (a,h) anthracene	ND	0.0025	1	06/11/2024 14:57
Dibenzofuran	ND	0.0013	1	06/11/2024 14:57
Di-n-butyl Phthalate	ND	0.062	1	06/11/2024 14:57
1,2-Dichlorobenzene	ND	0.25	1	06/11/2024 14:57
1,3-Dichlorobenzene	ND	0.25	1	06/11/2024 14:57
1,4-Dichlorobenzene	ND	0.25	1	06/11/2024 14:57
3,3-Dichlorobenzidine	ND	0.0013	1	06/11/2024 14:57
2,4-Dichlorophenol	ND	0.0025	1	06/11/2024 14:57
2,6-Dichlorophenol	ND	0.012	1	06/11/2024 14:57
Diethyl Phthalate	ND	0.012	1	06/11/2024 14:57

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	2406324-002A	Soil	06/05/2024 13:45	GC21 06112419.D	295353

Analytes	Result	RL	DF	Date Analyzed
2,4-Dimethylphenol	ND	0.25	1	06/11/2024 14:57
Dimethyl Phthalate	ND	0.0025	1	06/11/2024 14:57
4,6-Dinitro-2-methylphenol	ND	1.2	1	06/11/2024 14:57
2,4-Dinitrophenol	ND	0.25	1	06/11/2024 14:57
2,4-Dinitrotoluene	ND	0.012	1	06/11/2024 14:57
2,6-Dinitrotoluene	ND	0.012	1	06/11/2024 14:57
Di-n-octyl Phthalate	ND	0.62	1	06/11/2024 14:57
1,2-Diphenylhydrazine	ND	0.25	1	06/11/2024 14:57
Fluoranthene	ND	0.0025	1	06/11/2024 14:57
Fluorene	ND	0.0025	1	06/11/2024 14:57
Hexachlorobenzene	ND	0.0013	1	06/11/2024 14:57
Hexachlorobutadiene	ND	0.0013	1	06/11/2024 14:57
Hexachlorocyclopentadiene	ND	1.2	1	06/11/2024 14:57
Hexachloroethane	ND	0.0025	1	06/11/2024 14:57
Indeno (1,2,3-cd) pyrene	ND	0.0025	1	06/11/2024 14:57
Isophorone	ND	0.25	1	06/11/2024 14:57
1-Methylnaphthalene	ND	0.0013	1	06/11/2024 14:57
2-Methylnaphthalene	ND	0.0013	1	06/11/2024 14:57
2-Methylphenol (o-Cresol)	ND	0.25	1	06/11/2024 14:57
3 & 4-Methylphenol (m,p-Cresol)	ND	0.25	1	06/11/2024 14:57
Naphthalene	ND	0.0025	1	06/11/2024 14:57
2-Nitroaniline	ND	1.2	1	06/11/2024 14:57
3-Nitroaniline	ND	1.2	1	06/11/2024 14:57
4-Nitroaniline	ND	1.2	1	06/11/2024 14:57
Nitrobenzene	ND	0.25	1	06/11/2024 14:57
2-Nitrophenol	ND	1.2	1	06/11/2024 14:57
4-Nitrophenol	ND	1.2	1	06/11/2024 14:57
N-Nitrosodiphenylamine	ND	0.25	1	06/11/2024 14:57
N-Nitrosodi-n-propylamine	ND	0.25	1	06/11/2024 14:57
Pentachlorophenol	ND	0.062	1	06/11/2024 14:57
Phenanthrene	ND	0.0013	1	06/11/2024 14:57
Phenol	ND	0.010	1	06/11/2024 14:57
Pyrene	ND	0.0013	1	06/11/2024 14:57
Pyridine	ND	0.25	1	06/11/2024 14:57
1,2,4-Trichlorobenzene	ND	0.25	1	06/11/2024 14:57
2,4,5-Trichlorophenol	ND	0.0025	1	06/11/2024 14:57

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	**2406324-002A**	**Soil**	**06/05/2024 13:45**	**GC21 06112419.D**	**295353**

Analytes	Result	RL	DF	Date Analyzed
2,4,6-Trichlorophenol	ND	0.0025	1	06/11/2024 14:57
N-Nitrosodimethylamine	ND	1.2	1	06/11/2024 14:57
2,3,4,6-Tetrachlorophenol	ND	0.25	1	06/11/2024 14:57

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorophenol	97	60-130	06/11/2024 14:57
Phenol-d5	96	50-130	06/11/2024 14:57
Nitrobenzene-d5	90	60-130	06/11/2024 14:57
2-Fluorobiphenyl	93	60-130	06/11/2024 14:57
2,4,6-Tribromophenol	63	50-130	06/11/2024 14:57
4-Terphenyl-d14	98	50-130	06/11/2024 14:57

Analyst(s): MV

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	**2406324-003A**	**Soil**	**06/05/2024 14:02**	**GC21 06112420.D**	**295353**

Analytes	Result	RL	DF	Date Analyzed
Acenaphthene	ND	0.0013	1	06/11/2024 15:26
Acenaphthylene	ND	0.0013	1	06/11/2024 15:26
Acetochlor	ND	0.25	1	06/11/2024 15:26
Anthracene	ND	0.0013	1	06/11/2024 15:26
Benzidine	ND	1.2	1	06/11/2024 15:26
Benzo (a) anthracene	ND	0.012	1	06/11/2024 15:26
Benzo (a) pyrene	ND	0.0013	1	06/11/2024 15:26
Benzo (b) fluoranthene	ND	0.0025	1	06/11/2024 15:26
Benzo (g,h,i) perylene	ND	0.0025	1	06/11/2024 15:26
Benzo (k) fluoranthene	ND	0.0025	1	06/11/2024 15:26
Benzoic Acid	ND	1.2	1	06/11/2024 15:26
Benzyl Alcohol	ND	1.2	1	06/11/2024 15:26
1,1-Biphenyl	ND	0.012	1	06/11/2024 15:26
Bis (2-chloroethoxy) Methane	ND	0.25	1	06/11/2024 15:26
Bis (2-chloroethyl) Ether	ND	0.0013	1	06/11/2024 15:26
Bis (2-chloroisopropyl) Ether	ND	0.0025	1	06/11/2024 15:26
Bis (2-ethylhexyl) Adipate	ND	0.25	1	06/11/2024 15:26
Bis (2-ethylhexyl) Phthalate	ND	0.062	1	06/11/2024 15:26
4-Bromophenyl Phenyl Ether	ND	0.25	1	06/11/2024 15:26
Butylbenzyl Phthalate	ND	0.062	1	06/11/2024 15:26
4-Chloroaniline	ND	0.0013	1	06/11/2024 15:26
4-Chloro-3-methylphenol	ND	0.25	1	06/11/2024 15:26
2-Chloronaphthalene	ND	0.25	1	06/11/2024 15:26
2-Chlorophenol	ND	0.012	1	06/11/2024 15:26
4-Chlorophenyl Phenyl Ether	ND	0.25	1	06/11/2024 15:26
Chrysene	ND	0.0013	1	06/11/2024 15:26
Dibenzo (a,h) anthracene	ND	0.0025	1	06/11/2024 15:26
Dibenzofuran	ND	0.0013	1	06/11/2024 15:26
Di-n-butyl Phthalate	ND	0.062	1	06/11/2024 15:26
1,2-Dichlorobenzene	ND	0.25	1	06/11/2024 15:26
1,3-Dichlorobenzene	ND	0.25	1	06/11/2024 15:26
1,4-Dichlorobenzene	ND	0.25	1	06/11/2024 15:26
3,3-Dichlorobenzidine	ND	0.0013	1	06/11/2024 15:26
2,4-Dichlorophenol	ND	0.0025	1	06/11/2024 15:26
2,6-Dichlorophenol	ND	0.012	1	06/11/2024 15:26
Diethyl Phthalate	ND	0.012	1	06/11/2024 15:26

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	2406324-003A	Soil	06/05/2024 14:02	GC21 06112420.D	295353

Analytes	Result	RL	DF	Date Analyzed
2,4-Dimethylphenol	ND	0.25	1	06/11/2024 15:26
Dimethyl Phthalate	ND	0.0025	1	06/11/2024 15:26
4,6-Dinitro-2-methylphenol	ND	1.2	1	06/11/2024 15:26
2,4-Dinitrophenol	ND	0.25	1	06/11/2024 15:26
2,4-Dinitrotoluene	ND	0.012	1	06/11/2024 15:26
2,6-Dinitrotoluene	ND	0.012	1	06/11/2024 15:26
Di-n-octyl Phthalate	ND	0.62	1	06/11/2024 15:26
1,2-Diphenylhydrazine	ND	0.25	1	06/11/2024 15:26
Fluoranthene	ND	0.0025	1	06/11/2024 15:26
Fluorene	ND	0.0025	1	06/11/2024 15:26
Hexachlorobenzene	ND	0.0013	1	06/11/2024 15:26
Hexachlorobutadiene	ND	0.0013	1	06/11/2024 15:26
Hexachlorocyclopentadiene	ND	1.2	1	06/11/2024 15:26
Hexachloroethane	ND	0.0025	1	06/11/2024 15:26
Indeno (1,2,3-cd) pyrene	ND	0.0025	1	06/11/2024 15:26
Isophorone	ND	0.25	1	06/11/2024 15:26
1-Methylnaphthalene	ND	0.0013	1	06/11/2024 15:26
2-Methylnaphthalene	ND	0.0013	1	06/11/2024 15:26
2-Methylphenol (o-Cresol)	ND	0.25	1	06/11/2024 15:26
3 & 4-Methylphenol (m,p-Cresol)	ND	0.25	1	06/11/2024 15:26
Naphthalene	ND	0.0025	1	06/11/2024 15:26
2-Nitroaniline	ND	1.2	1	06/11/2024 15:26
3-Nitroaniline	ND	1.2	1	06/11/2024 15:26
4-Nitroaniline	ND	1.2	1	06/11/2024 15:26
Nitrobenzene	ND	0.25	1	06/11/2024 15:26
2-Nitrophenol	ND	1.2	1	06/11/2024 15:26
4-Nitrophenol	ND	1.2	1	06/11/2024 15:26
N-Nitrosodiphenylamine	ND	0.25	1	06/11/2024 15:26
N-Nitrosodi-n-propylamine	ND	0.25	1	06/11/2024 15:26
Pentachlorophenol	ND	0.062	1	06/11/2024 15:26
Phenanthrene	ND	0.0013	1	06/11/2024 15:26
Phenol	ND	0.010	1	06/11/2024 15:26
Pyrene	ND	0.0013	1	06/11/2024 15:26
Pyridine	ND	0.25	1	06/11/2024 15:26
1,2,4-Trichlorobenzene	ND	0.25	1	06/11/2024 15:26
2,4,5-Trichlorophenol	ND	0.0025	1	06/11/2024 15:26

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	**2406324-003A**	**Soil**	**06/05/2024 14:02**	**GC21 06112420.D**	**295353**

Analytes	Result	RL	DF	Date Analyzed
2,4,6-Trichlorophenol	ND	0.0025	1	06/11/2024 15:26
N-Nitrosodimethylamine	ND	1.2	1	06/11/2024 15:26
2,3,4,6-Tetrachlorophenol	ND	0.25	1	06/11/2024 15:26

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorophenol	110	60-130	06/11/2024 15:26
Phenol-d5	105	50-130	06/11/2024 15:26
Nitrobenzene-d5	95	60-130	06/11/2024 15:26
2-Fluorobiphenyl	101	60-130	06/11/2024 15:26
2,4,6-Tribromophenol	70	50-130	06/11/2024 15:26
4-Terphenyl-d14	110	50-130	06/11/2024 15:26

Analyst(s): MV

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	2406324-004A	Soil	06/05/2024 14:14	GC21 06112421.D	295353

Analytes	Result	RL	DF	Date Analyzed
Acenaphthene	ND	0.0013	1	06/11/2024 15:55
Acenaphthylene	ND	0.0013	1	06/11/2024 15:55
Acetochlor	ND	0.25	1	06/11/2024 15:55
Anthracene	ND	0.0013	1	06/11/2024 15:55
Benzidine	ND	1.2	1	06/11/2024 15:55
Benzo (a) anthracene	ND	0.012	1	06/11/2024 15:55
Benzo (a) pyrene	ND	0.0013	1	06/11/2024 15:55
Benzo (b) fluoranthene	ND	0.0025	1	06/11/2024 15:55
Benzo (g,h,i) perylene	ND	0.0025	1	06/11/2024 15:55
Benzo (k) fluoranthene	ND	0.0025	1	06/11/2024 15:55
Benzoic Acid	ND	1.2	1	06/11/2024 15:55
Benzyl Alcohol	ND	1.2	1	06/11/2024 15:55
1,1-Biphenyl	ND	0.012	1	06/11/2024 15:55
Bis (2-chloroethoxy) Methane	ND	0.25	1	06/11/2024 15:55
Bis (2-chloroethyl) Ether	ND	0.0013	1	06/11/2024 15:55
Bis (2-chloroisopropyl) Ether	ND	0.0025	1	06/11/2024 15:55
Bis (2-ethylhexyl) Adipate	ND	0.25	1	06/11/2024 15:55
Bis (2-ethylhexyl) Phthalate	ND	0.062	1	06/11/2024 15:55
4-Bromophenyl Phenyl Ether	ND	0.25	1	06/11/2024 15:55
Butylbenzyl Phthalate	ND	0.062	1	06/11/2024 15:55
4-Chloroaniline	ND	0.0013	1	06/11/2024 15:55
4-Chloro-3-methylphenol	ND	0.25	1	06/11/2024 15:55
2-Chloronaphthalene	ND	0.25	1	06/11/2024 15:55
2-Chlorophenol	ND	0.012	1	06/11/2024 15:55
4-Chlorophenyl Phenyl Ether	ND	0.25	1	06/11/2024 15:55
Chrysene	ND	0.0013	1	06/11/2024 15:55
Dibenzo (a,h) anthracene	ND	0.0025	1	06/11/2024 15:55
Dibenzofuran	ND	0.0013	1	06/11/2024 15:55
Di-n-butyl Phthalate	ND	0.062	1	06/11/2024 15:55
1,2-Dichlorobenzene	ND	0.25	1	06/11/2024 15:55
1,3-Dichlorobenzene	ND	0.25	1	06/11/2024 15:55
1,4-Dichlorobenzene	ND	0.25	1	06/11/2024 15:55
3,3-Dichlorobenzidine	ND	0.0013	1	06/11/2024 15:55
2,4-Dichlorophenol	ND	0.0025	1	06/11/2024 15:55
2,6-Dichlorophenol	ND	0.012	1	06/11/2024 15:55
Diethyl Phthalate	ND	0.012	1	06/11/2024 15:55

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	2406324-004A	Soil	06/05/2024 14:14	GC21 06112421.D	295353

Analytes	Result	RL	DF	Date Analyzed
2,4-Dimethylphenol	ND	0.25	1	06/11/2024 15:55
Dimethyl Phthalate	ND	0.0025	1	06/11/2024 15:55
4,6-Dinitro-2-methylphenol	ND	1.2	1	06/11/2024 15:55
2,4-Dinitrophenol	ND	0.25	1	06/11/2024 15:55
2,4-Dinitrotoluene	ND	0.012	1	06/11/2024 15:55
2,6-Dinitrotoluene	ND	0.012	1	06/11/2024 15:55
Di-n-octyl Phthalate	ND	0.62	1	06/11/2024 15:55
1,2-Diphenylhydrazine	ND	0.25	1	06/11/2024 15:55
Fluoranthene	ND	0.0025	1	06/11/2024 15:55
Fluorene	ND	0.0025	1	06/11/2024 15:55
Hexachlorobenzene	ND	0.0013	1	06/11/2024 15:55
Hexachlorobutadiene	ND	0.0013	1	06/11/2024 15:55
Hexachlorocyclopentadiene	ND	1.2	1	06/11/2024 15:55
Hexachloroethane	ND	0.0025	1	06/11/2024 15:55
Indeno (1,2,3-cd) pyrene	ND	0.0025	1	06/11/2024 15:55
Isophorone	ND	0.25	1	06/11/2024 15:55
1-Methylnaphthalene	ND	0.0013	1	06/11/2024 15:55
2-Methylnaphthalene	ND	0.0013	1	06/11/2024 15:55
2-Methylphenol (o-Cresol)	ND	0.25	1	06/11/2024 15:55
3 & 4-Methylphenol (m,p-Cresol)	ND	0.25	1	06/11/2024 15:55
Naphthalene	ND	0.0025	1	06/11/2024 15:55
2-Nitroaniline	ND	1.2	1	06/11/2024 15:55
3-Nitroaniline	ND	1.2	1	06/11/2024 15:55
4-Nitroaniline	ND	1.2	1	06/11/2024 15:55
Nitrobenzene	ND	0.25	1	06/11/2024 15:55
2-Nitrophenol	ND	1.2	1	06/11/2024 15:55
4-Nitrophenol	ND	1.2	1	06/11/2024 15:55
N-Nitrosodiphenylamine	ND	0.25	1	06/11/2024 15:55
N-Nitrosodi-n-propylamine	ND	0.25	1	06/11/2024 15:55
Pentachlorophenol	ND	0.062	1	06/11/2024 15:55
Phenanthrene	ND	0.0013	1	06/11/2024 15:55
Phenol	ND	0.010	1	06/11/2024 15:55
Pyrene	ND	0.0013	1	06/11/2024 15:55
Pyridine	ND	0.25	1	06/11/2024 15:55
1,2,4-Trichlorobenzene	ND	0.25	1	06/11/2024 15:55
2,4,5-Trichlorophenol	ND	0.0025	1	06/11/2024 15:55

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/10/2024	**Analytical Method:**	SW8270E
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Semi-Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	**2406324-004A**	**Soil**	**06/05/2024 14:14**	**GC21 06112421.D**	**295353**

Analytes	Result	RL	DF	Date Analyzed
2,4,6-Trichlorophenol	ND	0.0025	1	06/11/2024 15:55
N-Nitrosodimethylamine	ND	1.2	1	06/11/2024 15:55
2,3,4,6-Tetrachlorophenol	ND	0.25	1	06/11/2024 15:55

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorophenol	104	60-130	06/11/2024 15:55
Phenol-d5	97	50-130	06/11/2024 15:55
Nitrobenzene-d5	87	60-130	06/11/2024 15:55
2-Fluorobiphenyl	93	60-130	06/11/2024 15:55
2,4,6-Tribromophenol	60	50-130	06/11/2024 15:55
4-Terphenyl-d14	99	50-130	06/11/2024 15:55

Analyst(s): MV

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3050B
Date Prepared:	06/14/2024	**Analytical Method:**	SW6020
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg-dry

CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1,2,3,4	**2406324-005A**	**Soil**	**06/06/2024 14:14**	**ICP-MS4 107SMPL.d**	**295785**

Analytes	Result	RL	DF	Date Analyzed
Antimony	ND	0.56	1	06/17/2024 10:36
Arsenic	**2.9**	0.56	1	06/17/2024 10:36
Barium	**1700**	5.6	1	06/17/2024 10:36
Beryllium	**0.80**	0.56	1	06/17/2024 10:36
Cadmium	ND	0.56	1	06/17/2024 10:36
Chromium	**77**	0.56	1	06/17/2024 10:36
Cobalt	**13**	0.56	1	06/17/2024 10:36
Copper	**200**	0.56	1	06/17/2024 10:36
Lead	**9.2**	0.56	1	06/17/2024 10:36
Mercury	**0.17**	0.056	1	06/17/2024 10:36
Molybdenum	ND	0.56	1	06/17/2024 10:36
Nickel	**120**	0.56	1	06/17/2024 10:36
Selenium	**0.65**	0.56	1	06/17/2024 10:36
Silver	ND	0.56	1	06/17/2024 10:36
Thallium	ND	0.56	1	06/17/2024 10:36
Vanadium	**72**	0.56	1	06/17/2024 10:36
Zinc	**72**	5.6	1	06/17/2024 10:36

Surrogates	REC (%)	Limits	Date Analyzed
Terbium	103	70-130	06/17/2024 10:36

Analyst(s): DB

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	ASTM D2216
Date Prepared:	06/14/2024	**Analytical Method:**	SW8000
Project:	16484.001.001; Scotts Valley Development	**Unit:**	wet wt%

Percent Moisture

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1,2,3,4	**2406324-005A**	**Soil**	**06/06/2024 14:14**	**WetChem**	**295779**

Analytes	Result	RL	Date Analyzed
% Moisture	**10.7**	0.100	06/14/2024 13:50

Analyst(s): JME

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8015B
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1	**2406324-001A**	**Soil**	**06/05/2024 13:30**	**GC11B 06092415.D**	**295173**

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	2.0	1	06/09/2024 16:40
TPH-Motor Oil (C18-C36)	ND	10	1	06/09/2024 16:40

Surrogates	REC (%)	Limits	Date Analyzed
C9	90	70-130	06/09/2024 16:40

Analyst(s): JNG

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S2	**2406324-002A**	**Soil**	**06/05/2024 13:45**	**GC11B 06092417.D**	**295173**

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	2.0	1	06/09/2024 17:18
TPH-Motor Oil (C18-C36)	**11**	10	1	06/09/2024 17:18

Surrogates	REC (%)	Limits	Date Analyzed
C9	87	70-130	06/09/2024 17:18

Analyst(s): JNG   Analytical Comments: e7

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S3	**2406324-003A**	**Soil**	**06/05/2024 14:02**	**GC11B 06092409.D**	**295173**

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	2.0	1	06/09/2024 14:45
TPH-Motor Oil (C18-C36)	ND	10	1	06/09/2024 14:45

Surrogates	REC (%)	Limits	Date Analyzed
C9	105	70-130	06/09/2024 14:45

Analyst(s): JNG

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	SW3550B
Date Prepared:	06/06/2024	**Analytical Method:**	SW8015B
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/Kg

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S4	**2406324-004A**	**Soil**	**06/05/2024 14:14**	**GC11B 06092411.D**	**295173**

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	2.0	1	06/09/2024 15:23
TPH-Motor Oil (C18-C36)	ND	10	1	06/09/2024 15:23

Surrogates	REC (%)	Limits		
C9	92	70-130		06/09/2024 15:23

Analyst(s): JNG

Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/06/2024	**BatchID:**	295213
Date Analyzed:	06/06/2024 - 06/08/2024	**Extraction Method:**	SW3550B
Instrument:	GC20, GC23	**Analytical Method:**	SW8081B/8082A
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295213 2406324-001AMS/MSD

QC Summary Report for SW8081B/8082A

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Aldrin	ND	0.00042	0.0010	-	-	-
a-BHC	ND	0.00045	0.0010	-	-	-
b-BHC	ND	0.00038	0.0010	-	-	-
d-BHC	ND	0.00036	0.0010	-	-	-
g-BHC	ND	0.00036	0.0010	-	-	-
Chlordane (Technical)	ND	0.010	0.025	-	-	-
a-Chlordane	ND	0.00035	0.0010	-	-	-
g-Chlordane	ND	0.00067	0.0010	-	-	-
p,p-DDD	ND	0.00057	0.0010	-	-	-
p,p-DDE	ND	0.00034	0.0010	-	-	-
p,p-DDT	ND	0.00043	0.0010	-	-	-
Dieldrin	ND	0.00041	0.0010	-	-	-
Endosulfan I	ND	0.00040	0.0010	-	-	-
Endosulfan II	ND	0.00051	0.0010	-	-	-
Endosulfan sulfate	ND	0.00040	0.0010	-	-	-
Endrin	ND	0.00045	0.0010	-	-	-
Endrin aldehyde	ND	0.00045	0.0010	-	-	-
Endrin ketone	ND	0.00042	0.0010	-	-	-
Heptachlor	ND	0.00067	0.0010	-	-	-
Heptachlor epoxide	ND	0.00041	0.0010	-	-	-
Hexachlorobenzene	ND	0.00038	0.010	-	-	-
Hexachlorocyclopentadiene	ND	0.00064	0.020	-	-	-
Methoxychlor	ND	0.00063	0.0010	-	-	-
Toxaphene	ND	0.064	0.20	-	-	-
Aroclor1016	ND	0.037	0.050	-	-	-
Aroclor1221	ND	0.037	0.050	-	-	-
Aroclor1232	ND	0.037	0.050	-	-	-
Aroclor1242	ND	0.037	0.050	-	-	-
Aroclor1248	ND	0.037	0.050	-	-	-
Aroclor1254	ND	0.037	0.050	-	-	-
Aroclor1260	ND	0.037	0.050	-	-	-
Surrogate Recovery						
Decachlorobiphenyl	0.049			0.05	97	70-130

(Cont.)

Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/06/2024	**BatchID:**	295213
Date Analyzed:	06/06/2024 - 06/08/2024	**Extraction Method:**	SW3550B
Instrument:	GC20, GC23	**Analytical Method:**	SW8081B/8082A
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295213 2406324-001AMS/MSD

QC Summary Report for SW8081B/8082A

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Aldrin	0.047	0.048	0.050	95	95	70-130	0.800	20
a-BHC	0.046	0.047	0.050	92	93	70-130	1.20	20
b-BHC	0.045	0.045	0.050	89	89	70-130	0.403	20
d-BHC	0.034	0.034	0.050	68,F2	68,F2	70-130	0.551	20
g-BHC	0.046	0.046	0.050	92	92	70-130	0.358	20
a-Chlordane	0.047	0.047	0.050	94	94	70-130	0.0139	20
g-Chlordane	0.047	0.047	0.050	94	94	70-130	0.129	20
p,p-DDD	0.045	0.045	0.050	90	91	70-130	0.565	20
p,p-DDE	0.049	0.049	0.050	99	98	70-130	0.272	20
p,p-DDT	0.051	0.049	0.050	101	99	70-130	2.38	20
Dieldrin	0.048	0.048	0.050	95	95	70-130	0.145	20
Endosulfan I	0.046	0.046	0.050	93	93	70-130	0.0716	20
Endosulfan II	0.046	0.046	0.050	92	91	70-130	0.197	20
Endosulfan sulfate	0.042	0.042	0.050	83	83	70-130	0.300	20
Endrin	0.050	0.049	0.050	100	98	70-130	1.19	20
Endrin aldehyde	0.047	0.047	0.050	94	94	70-130	0.229	20
Endrin ketone	0.049	0.049	0.050	99	98	70-130	0.768	20
Heptachlor	0.049	0.048	0.050	97	97	70-130	0.770	20
Heptachlor epoxide	0.046	0.046	0.050	92	92	70-130	0.281	20
Hexachlorobenzene	0.043	0.043	0.050	86	86	70-130	0.267	20
Hexachlorocyclopentadiene	0.045	0.044	0.050	90	88	50-130	2.07	20
Methoxychlor	0.051	0.050	0.050	102	100	70-130	1.82	20
Surrogate Recovery								
Decachlorobiphenyl	0.050	0.050	0.050	99	100	70-130	0.616	20

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Aldrin	1	0.045	0.045	0.050	ND	89	90	60-130	0.542	20
a-BHC	1	0.051	0.050	0.050	ND	101	100	60-130	0.684	20
b-BHC	1	0.046	0.045	0.050	ND	91	91	60-130	0.502	20
d-BHC	1	0.035	0.035	0.050	ND	70	71	60-130	0.630	20
g-BHC	1	0.053	0.053	0.050	ND	107	107	60-130	0.0677	20
a-Chlordane	1	0.044	0.045	0.050	ND	87	89	60-130	2.07	20
g-Chlordane	1	0.051	0.052	0.050	ND	101	103	60-130	2.06	20
p,p-DDD	1	0.049	0.052	0.050	ND	99	103	60-130	4.41	20
p,p-DDE	1	0.045	0.046	0.050	ND	90	93	60-130	3.04	20

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/06/2024	**BatchID:**	295213
Date Analyzed:	06/06/2024 - 06/08/2024	**Extraction Method:**	SW3550B
Instrument:	GC20, GC23	**Analytical Method:**	SW8081B/8082A
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295213 2406324-001AMS/MSD

QC Summary Report for SW8081B/8082A

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
p,p-DDT	1	0.057	0.059	0.050	ND	114	117	60-130	2.90	20
Dieldrin	1	0.047	0.048	0.050	ND	94	97	60-130	2.53	20
Endosulfan I	1	0.046	0.047	0.050	ND	91	93	60-130	2.34	20
Endosulfan II	1	0.047	0.048	0.050	ND	94	96	60-130	2.24	20
Endosulfan sulfate	1	0.053	0.054	0.050	ND	106	108	60-130	2.45	20
Endrin	1	0.061	0.063	0.050	ND	122	126	60-130	2.97	20
Endrin aldehyde	1	0.047	0.048	0.050	ND	94	96	60-130	2.25	20
Endrin ketone	1	0.055	0.056	0.050	ND	111	112	60-130	1.44	20
Heptachlor	1	0.061	0.062	0.050	ND	123	124	60-130	1.46	20
Heptachlor epoxide	1	0.047	0.048	0.050	ND	95	96	60-130	0.973	20
Hexachlorobenzene	1	0.046	0.046	0.050	ND	93	92	60-130	0.771	20
Hexachlorocyclopentadiene	1	0.072	0.068	0.050	ND	144,F1	136,F1	50-130	5.78	20
Methoxychlor	1	0.056	0.058	0.050	ND	112	115	60-130	2.34	20
Surrogate Recovery										
Decachlorobiphenyl	1	0.048	0.050	0.050		96	100	60-130	4.61	20

Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/05/2024	**BatchID:**	295160
Date Analyzed:	06/10/2024 - 06/12/2024	**Extraction Method:**	SW5030B
Instrument:	GC38	**Analytical Method:**	SW8260D
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295160

QC Summary Report for SW8260D

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g)	ND	0.25	0.25	-	-	-
Surrogate Recovery						
Dibromofluoromethane	0.11			0.125	90	70-140
Benzene-D6	0.086			0.1	86	70-140

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(g)	0.99	1.0	1	99	104	70-130	4.94	20
Surrogate Recovery								
Dibromofluoromethane	0.12	0.12	0.12	94	93	70-140	1.09	20
Benzene-D6	0.087	0.091	0.10	87	91	70-140	4.66	20

Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/05/2024	**BatchID:**	295160
Date Analyzed:	06/07/2024	**Extraction Method:**	SW5030B
Instrument:	GC49	**Analytical Method:**	SW8260D
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295160

QC Summary Report for SW8260D

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Acetone	ND	0.12	0.20	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.0012	0.0050	-	-	-
Benzene	ND	0.00095	0.0050	-	-	-
Bromobenzene	ND	0.0012	0.0050	-	-	-
Bromochloromethane	ND	0.0011	0.0050	-	-	-
Bromodichloromethane	ND	0.00023	0.0050	-	-	-
Bromoform	ND	0.0038	0.0050	-	-	-
Bromomethane	ND	0.0018	0.0050	-	-	-
2-Butanone (MEK)	ND	0.040	0.10	-	-	-
t-Butyl alcohol (TBA)	ND	0.024	0.050	-	-	-
n-Butyl benzene	ND	0.0016	0.0050	-	-	-
sec-Butyl benzene	ND	0.0018	0.0050	-	-	-
tert-Butyl benzene	ND	0.0021	0.0050	-	-	-
Carbon Disulfide	ND	0.0011	0.0050	-	-	-
Carbon Tetrachloride	ND	0.00017	0.0050	-	-	-
Chlorobenzene	ND	0.0012	0.0050	-	-	-
Chloroethane	ND	0.0017	0.0050	-	-	-
Chloroform	ND	0.00032	0.0050	-	-	-
Chloromethane	ND	0.0017	0.0050	-	-	-
2-Chlorotoluene	ND	0.0016	0.0050	-	-	-
4-Chlorotoluene	ND	0.0013	0.0050	-	-	-
Dibromochloromethane	ND	0.00040	0.0050	-	-	-
1,2-Dibromo-3-chloropropane	ND	0.00048	0.00050	-	-	-
1,2-Dibromoethane (EDB)	ND	0.00013	0.00025	-	-	-
Dibromomethane	ND	0.0012	0.0050	-	-	-
1,2-Dichlorobenzene	ND	0.0017	0.0050	-	-	-
1,3-Dichlorobenzene	ND	0.0015	0.0050	-	-	-
1,4-Dichlorobenzene	ND	0.0015	0.0050	-	-	-
Dichlorodifluoromethane	ND	0.00063	0.0050	-	-	-
1,1-Dichloroethane	ND	0.0015	0.0050	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	0.000070	0.00010	-	-	-
1,1-Dichloroethene	ND	0.00011	0.0050	-	-	-
cis-1,2-Dichloroethene	ND	0.0012	0.0050	-	-	-
trans-1,2-Dichloroethene	ND	0.0012	0.0050	-	-	-
1,2-Dichloropropane	ND	0.0013	0.0050	-	-	-
1,3-Dichloropropane	ND	0.00088	0.0050	-	-	-
2,2-Dichloropropane	ND	0.0019	0.0050	-	-	-
1,1-Dichloropropene	ND	0.0018	0.0050	-	-	-

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/05/2024	**BatchID:**	295160
Date Analyzed:	06/07/2024	**Extraction Method:**	SW5030B
Instrument:	GC49	**Analytical Method:**	SW8260D
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295160

QC Summary Report for SW8260D

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
cis-1,3-Dichloropropene	ND	0.00098	0.0050	-	-	-
trans-1,3-Dichloropropene	ND	0.00097	0.0050	-	-	-
Diisopropyl ether (DIPE)	ND	0.0018	0.0050	-	-	-
Ethylbenzene	ND	0.0011	0.0050	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.0014	0.0050	-	-	-
Freon 113	ND	0.0011	0.0050	-	-	-
Hexachlorobutadiene	ND	0.0012	0.0050	-	-	-
Hexachloroethane	ND	0.00064	0.0050	-	-	-
2-Hexanone	ND	0.0027	0.0050	-	-	-
Isopropylbenzene	ND	0.0018	0.0050	-	-	-
4-Isopropyl toluene	ND	0.0019	0.0050	-	-	-
Methyl-t-butyl ether (MTBE)	ND	0.0015	0.0050	-	-	-
Methylene chloride	ND	0.012	0.020	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	0.0017	0.0050	-	-	-
Naphthalene	ND	0.0030	0.0050	-	-	-
n-Propyl benzene	ND	0.0019	0.0050	-	-	-
Styrene	ND	0.0014	0.0050	-	-	-
1,1,1,2-Tetrachloroethane	ND	0.0013	0.0050	-	-	-
1,1,2,2-Tetrachloroethane	ND	0.00044	0.0050	-	-	-
Tetrachloroethene	ND	0.00029	0.0050	-	-	-
Toluene	ND	0.0016	0.0050	-	-	-
1,2,3-Trichlorobenzene	ND	0.0021	0.0050	-	-	-
1,2,4-Trichlorobenzene	ND	0.0016	0.0050	-	-	-
1,1,1-Trichloroethane	ND	0.0016	0.0050	-	-	-
1,1,2-Trichloroethane	ND	0.0012	0.0050	-	-	-
Trichloroethene	ND	0.0014	0.0050	-	-	-
Trichlorofluoromethane	ND	0.0013	0.0050	-	-	-
1,2,3-Trichloropropane	ND	0.00017	0.00025	-	-	-
1,2,4-Trimethylbenzene	ND	0.0016	0.0050	-	-	-
1,3,5-Trimethylbenzene	ND	0.0017	0.0050	-	-	-
Vinyl Chloride	ND	0.00012	0.00025	-	-	-
m,p-Xylene	ND	0.0026	0.0050	-	-	-
o-Xylene	ND	0.0014	0.0050	-	-	-

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/05/2024	**BatchID:**	295160
Date Analyzed:	06/07/2024	**Extraction Method:**	SW5030B
Instrument:	GC49	**Analytical Method:**	SW8260D
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295160

QC Summary Report for SW8260D

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Surrogate Recovery						
Dibromofluoromethane	0.12			0.125	95	70-140
Toluene-d8	0.14			0.125	110	70-140
4-BFB	0.013			0.0125	107	70-140
Benzene-d6	0.093			0.1	93	70-140
Ethylbenzene-d10	0.10			0.1	105	70-140
1,2-DCB-d4	0.071			0.1	71	70-140

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/05/2024	**BatchID:**	295160
Date Analyzed:	06/07/2024	**Extraction Method:**	SW5030B
Instrument:	GC49	**Analytical Method:**	SW8260D
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295160

QC Summary Report for SW8260D

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acetone	0.18	0.19	0.20	88	93	60-140	5.23	30
tert-Amyl methyl ether (TAME)	0.013	0.014	0.020	66	70	50-140	6.35	30
Benzene	0.016	0.017	0.020	82	87	60-140	6.48	30
Bromobenzene	0.018	0.020	0.020	92	98	60-140	6.21	30
Bromochloromethane	0.016	0.017	0.020	78	83	60-140	7.05	30
Bromodichloromethane	0.017	0.019	0.020	87	93	60-140	6.84	30
Bromoform	0.011	0.012	0.020	57	61	40-140	5.96	30
Bromomethane	0.018	0.018	0.020	88	92	30-140	4.88	30
2-Butanone (MEK)	0.068	0.065	0.080	85	81	50-140	4.49	30
t-Butyl alcohol (TBA)	0.060	0.062	0.080	75	78	50-140	4.07	30
n-Butyl benzene	0.024	0.025	0.020	122	127	60-150	3.64	30
sec-Butyl benzene	0.025	0.026	0.020	123	130	60-150	5.68	30
tert-Butyl benzene	0.022	0.023	0.020	111	116	60-140	4.46	30
Carbon Disulfide	0.017	0.019	0.020	85	93	50-140	8.65	30
Carbon Tetrachloride	0.019	0.020	0.020	93	100	60-140	7.80	30
Chlorobenzene	0.017	0.018	0.020	86	91	60-140	4.64	30
Chloroethane	0.017	0.018	0.020	84	92	50-140	9.04	30
Chloroform	0.018	0.019	0.020	89	95	60-140	6.31	30
Chloromethane	0.011	0.012	0.020	56	60	20-140	6.65	30
2-Chlorotoluene	0.021	0.022	0.020	103	110	60-140	6.59	30
4-Chlorotoluene	0.021	0.022	0.020	104	109	60-140	4.74	30
Dibromochloromethane	0.015	0.016	0.020	76	81	50-140	6.13	30
1,2-Dibromo-3-chloropropane	0.0080	0.0081	0.010	80	81	30-140	1.16	30
1,2-Dibromoethane (EDB)	0.010	0.010	0.010	100	105	40-140	4.71	30
Dibromomethane	0.015	0.017	0.020	77	83	60-140	7.23	30
1,2-Dichlorobenzene	0.016	0.016	0.020	80	81	60-140	1.06	30
1,3-Dichlorobenzene	0.019	0.020	0.020	96	102	60-140	5.62	30
1,4-Dichlorobenzene	0.018	0.019	0.020	91	97	60-140	6.19	30
Dichlorodifluoromethane	0.0041	0.0043	0.020	21	21	10-140	3.89	30
1,1-Dichloroethane	0.018	0.019	0.020	90	95	60-140	5.74	30
1,2-Dichloroethane (1,2-DCA)	0.018	0.019	0.020	89	94	60-140	6.43	30
1,1-Dichloroethene	0.018	0.020	0.020	91	98	60-140	7.34	30
cis-1,2-Dichloroethene	0.018	0.019	0.020	88	95	60-140	7.67	30
trans-1,2-Dichloroethene	0.018	0.020	0.020	90	98	60-140	8.35	30
1,2-Dichloropropane	0.017	0.018	0.020	83	89	60-140	6.50	30
1,3-Dichloropropane	0.016	0.017	0.020	80	84	60-140	5.39	30
2,2-Dichloropropane	0.021	0.023	0.020	105	114	60-140	8.00	30
1,1-Dichloropropene	0.018	0.020	0.020	92	99	60-140	7.54	30

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/05/2024	**BatchID:**	295160
Date Analyzed:	06/07/2024	**Extraction Method:**	SW5030B
Instrument:	GC49	**Analytical Method:**	SW8260D
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295160

QC Summary Report for SW8260D

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
cis-1,3-Dichloropropene	0.018	0.019	0.020	91	97	60-140	5.82	30
trans-1,3-Dichloropropene	0.018	0.019	0.020	92	97	60-140	5.81	30
Diisopropyl ether (DIPE)	0.016	0.017	0.020	79	84	60-140	5.64	30
Ethylbenzene	0.019	0.020	0.020	94	98	60-140	4.24	30
Ethyl tert-butyl ether (ETBE)	0.015	0.016	0.020	74	79	60-140	6.32	30
Freon 113	0.016	0.018	0.020	82	89	50-140	7.60	30
Hexachlorobutadiene	0.020	0.021	0.020	100	103	60-140	3.58	30
Hexachloroethane	0.017	0.019	0.020	87	93	60-140	6.42	30
2-Hexanone	0.013	0.015	0.020	67	74	40-140	10.5	30
Isopropylbenzene	0.022	0.023	0.020	109	117	60-140	7.33	30
4-Isopropyl toluene	0.024	0.025	0.020	120	127	60-150	6.25	30
Methyl-t-butyl ether (MTBE)	0.014	0.015	0.020	71	75	50-140	5.97	30
Methylene chloride	0.023	0.024	0.020	114	120	60-140	4.78	30
4-Methyl-2-pentanone (MIBK)	0.014	0.014	0.020	68	69	50-140	2.49	30
Naphthalene	0.011	0.0092	0.020	54	46	30-140	16.2	30
n-Propyl benzene	0.023	0.024	0.020	116	120	60-140	3.70	30
Styrene	0.014	0.015	0.020	72	75	60-140	4.24	30
1,1,1,2-Tetrachloroethane	0.016	0.018	0.020	81	88	60-140	8.59	30
1,1,2,2-Tetrachloroethane	0.015	0.015	0.020	73	77	40-140	5.54	30
Tetrachloroethene	0.020	0.022	0.020	101	109	60-140	7.46	30
Toluene	0.018	0.019	0.020	88	93	60-140	5.87	30
1,2,3-Trichlorobenzene	0.012	0.011	0.020	58	54	40-140	6.89	30
1,2,4-Trichlorobenzene	0.015	0.015	0.020	75	73	50-140	2.76	30
1,1,1-Trichloroethane	0.018	0.020	0.020	91	98	60-140	8.19	30
1,1,2-Trichloroethane	0.016	0.016	0.020	78	81	60-140	4.07	30
Trichloroethene	0.018	0.020	0.020	92	98	60-140	6.52	30
Trichlorofluoromethane	0.017	0.018	0.020	83	90	50-140	7.52	30
1,2,3-Trichloropropane	0.0088	0.0093	0.010	88	93	60-130	5.28	30
1,2,4-Trimethylbenzene	0.022	0.023	0.020	110	116	30-140	4.51	30
1,3,5-Trimethylbenzene	0.024	0.025	0.020	119	127	60-140	6.45	30
Vinyl Chloride	0.0067	0.0073	0.010	67	73	30-140	8.59	30
m,p-Xylene	0.036	0.038	0.040	90	95	60-140	5.56	30
o-Xylene	0.017	0.018	0.020	85	89	60-140	5.05	30

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/05/2024	**BatchID:**	295160
Date Analyzed:	06/07/2024	**Extraction Method:**	SW5030B
Instrument:	GC49	**Analytical Method:**	SW8260D
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295160

QC Summary Report for SW8260D

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Surrogate Recovery								
Dibromofluoromethane	0.12	0.12	0.12	96	97	70-140	1.28	30
Toluene-d8	0.14	0.14	0.12	111	112	70-140	0.382	30
4-BFB	0.014	0.014	0.012	112	111	70-140	0.826	30
Benzene-d6	0.10	0.10	0.10	100	101	70-140	0.906	30
Ethylbenzene-d10	0.11	0.11	0.10	111	112	70-140	1.41	30
1,2-DCB-d4	0.075	0.076	0.10	75	76	70-140	2.05	30

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/10/2024	**BatchID:**	295353
Date Analyzed:	06/10/2024	**Extraction Method:**	SW3550B
Instrument:	GC47	**Analytical Method:**	SW8270E
Matrix:	Soil	**Unit:**	mg/Kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295353

QC Summary Report for SW8270E

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Acenaphthene	ND	0.00035	0.0013	-	-	-
Acenaphthylene	ND	0.00028	0.0013	-	-	-
Acetochlor	ND	0.044	0.25	-	-	-
Anthracene	ND	0.00057	0.0013	-	-	-
Benzidine	ND	0.36	1.2	-	-	-
Benzo (a) anthracene	ND	0.0036	0.012	-	-	-
Benzo (a) pyrene	ND	0.00070	0.0013	-	-	-
Benzo (b) fluoranthene	ND	0.0011	0.0025	-	-	-
Benzo (g,h,i) perylene	ND	0.00089	0.0025	-	-	-
Benzo (k) fluoranthene	ND	0.0010	0.0025	-	-	-
Benzoic Acid	ND	0.32	1.2	-	-	-
Benzyl Alcohol	ND	0.55	1.2	-	-	-
1,1-Biphenyl	0.0029,J	0.0029	0.012	-	-	-
Bis (2-chloroethoxy) Methane	ND	0.030	0.25	-	-	-
Bis (2-chloroethyl) Ether	ND	0.00036	0.0013	-	-	-
Bis (2-chloroisopropyl) Ether	ND	0.0012	0.0025	-	-	-
Bis (2-ethylhexyl) Adipate	ND	0.085	0.25	-	-	-
Bis (2-ethylhexyl) Phthalate	0.0082,J	0.0047	0.062	-	-	-
4-Bromophenyl Phenyl Ether	ND	0.040	0.25	-	-	-
Butylbenzyl Phthalate	ND	0.0036	0.062	-	-	-
4-Chloro-3-methylphenol	ND	0.062	0.25	-	-	-
4-Chloroaniline	ND	0.00092	0.0013	-	-	-
2-Chloronaphthalene	ND	0.041	0.25	-	-	-
2-Chlorophenol	ND	0.0024	0.012	-	-	-
4-Chlorophenyl Phenyl Ether	ND	0.066	0.25	-	-	-
Chrysene	ND	0.00067	0.0013	-	-	-
Dibenzo (a,h) anthracene	ND	0.0011	0.0025	-	-	-
Dibenzofuran	ND	0.000093	0.0013	-	-	-
Di-n-butyl Phthalate	ND	0.0044	0.062	-	-	-
1,2-Dichlorobenzene	ND	0.053	0.25	-	-	-
1,3-Dichlorobenzene	ND	0.042	0.25	-	-	-
1,4-Dichlorobenzene	ND	0.049	0.25	-	-	-
3,3-Dichlorobenzidine	ND	0.00089	0.0013	-	-	-
2,4-Dichlorophenol	ND	0.0012	0.0025	-	-	-
Diethyl Phthalate	ND	0.0040	0.012	-	-	-
2,4-Dimethylphenol	ND	0.044	0.25	-	-	-
Dimethyl Phthalate	ND	0.0019	0.0025	-	-	-
4,6-Dinitro-2-methylphenol	ND	0.41	1.2	-	-	-

(Cont.)

Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/10/2024	**BatchID:**	295353
Date Analyzed:	06/10/2024	**Extraction Method:**	SW3550B
Instrument:	GC47	**Analytical Method:**	SW8270E
Matrix:	Soil	**Unit:**	mg/Kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295353

QC Summary Report for SW8270E

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
2,4-Dinitrophenol	ND	0.11	0.25	-	-	-
2,4-Dinitrotoluene	ND	0.0036	0.012	-	-	-
2,6-Dichlorophenol	ND	0.0032	0.012	-	-	-
2,6-Dinitrotoluene	ND	0.0078	0.012	-	-	-
Di-n-octyl Phthalate	ND	0.20	0.62	-	-	-
1,2-Diphenylhydrazine	ND	0.038	0.25	-	-	-
Fluoranthene	ND	0.00079	0.0025	-	-	-
Fluorene	ND	0.0010	0.0025	-	-	-
Hexachlorobenzene	ND	0.0012	0.0013	-	-	-
Hexachlorobutadiene	ND	0.00019	0.0013	-	-	-
Hexachlorocyclopentadiene	ND	0.52	1.2	-	-	-
Hexachloroethane	ND	0.00062	0.0025	-	-	-
Indeno (1,2,3-cd) pyrene	ND	0.0016	0.0025	-	-	-
Isophorone	ND	0.069	0.25	-	-	-
1-Methylnaphthalene	ND	0.00033	0.0013	-	-	-
2-Methylnaphthalene	ND	0.00048	0.0013	-	-	-
2-Methylphenol (o-Cresol)	ND	0.060	0.25	-	-	-
3 & 4-Methylphenol (m,p-Cresol)	ND	0.046	0.25	-	-	-
Naphthalene	ND	0.00042	0.0025	-	-	-
2-Nitroaniline	ND	0.31	1.2	-	-	-
3-Nitroaniline	ND	0.24	1.2	-	-	-
4-Nitroaniline	ND	0.28	1.2	-	-	-
Nitrobenzene	ND	0.055	0.25	-	-	-
2-Nitrophenol	ND	0.31	1.2	-	-	-
4-Nitrophenol	ND	0.35	1.2	-	-	-
N-Nitrosodimethylamine	ND	0.22	1.2	-	-	-
N-Nitrosodi-n-propylamine	ND	0.079	0.25	-	-	-
N-Nitrosodiphenylamine	ND	0.029	0.25	-	-	-
Pentachlorophenol	ND	0.029	0.062	-	-	-
Phenanthrene	ND	0.00068	0.0013	-	-	-
Phenol	ND	0.0018	0.010	-	-	-
Pyrene	ND	0.00063	0.0013	-	-	-
Pyridine	ND	0.046	0.25	-	-	-
2,3,4,6-Tetrachlorophenol	ND	0.079	0.25	-	-	-
1,2,4-Trichlorobenzene	ND	0.046	0.25	-	-	-
2,4,5-Trichlorophenol	ND	0.00059	0.0025	-	-	-
2,4,6-Trichlorophenol	ND	0.00057	0.0025	-	-	-

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/10/2024	**BatchID:**	295353
Date Analyzed:	06/10/2024	**Extraction Method:**	SW3550B
Instrument:	GC47	**Analytical Method:**	SW8270E
Matrix:	Soil	**Unit:**	mg/Kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295353

QC Summary Report for SW8270E

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Surrogate Recovery						
2-Fluorophenol	1.8			1.25	141,F3	60-130
Phenol-d5	1.7			1.25	138,F3	50-130
Nitrobenzene-d5	1.5			1.25	122	60-130
2-Fluorobiphenyl	1.6			1.25	124	60-130
2,4,6-Tribromophenol	1.1			1.25	90	50-130
4-Terphenyl-d14	1.7			1.25	138,F3	50-130

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/10/2024	**BatchID:**	295353
Date Analyzed:	06/10/2024	**Extraction Method:**	SW3550B
Instrument:	GC47	**Analytical Method:**	SW8270E
Matrix:	Soil	**Unit:**	mg/Kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295353

QC Summary Report for SW8270E

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acenaphthene	0.062	0.063	0.062	100	101	60-130	1.06	30
Acenaphthylene	0.060	0.061	0.062	96	98	60-130	1.80	30
Acetochlor	1.2	1.2	1.25	94	97	60-130	3.07	30
Anthracene	0.061	0.063	0.062	98	100	60-130	2.19	30
Benzidine	2.1	2.1	6.25	34	34	20-130	2.41	30
Benzo (a) anthracene	0.062	0.064	0.062	100	103	70-130	2.87	30
Benzo (a) pyrene	0.056	0.060	0.062	90	97	70-130	7.20	30
Benzo (b) fluoranthene	0.054	0.057	0.062	87	91	60-130	4.21	30
Benzo (g,h,i) perylene	0.054	0.056	0.062	86	89	70-130	3.67	30
Benzo (k) fluoranthene	0.069	0.070	0.062	111	113	70-130	1.45	30
Benzoic Acid	5.6	6.1	6.25	89	97	15-130	8.58	30
Benzyl Alcohol	5.2	5.3	6.25	83	86	70-130	3.15	30
1,1-Biphenyl	0.065	0.066	0.062	104	105	60-130	0.757	30
Bis (2-chloroethoxy) Methane	1.2	1.2	1.25	96	97	70-130	0.679	30
Bis (2-chloroethyl) Ether	0.054	0.055	0.062	86	89	60-130	3.31	30
Bis (2-chloroisopropyl) Ether	0.058	0.061	0.062	93	97	60-130	3.82	30
Bis (2-ethylhexyl) Adipate	1.4	1.5	1.25	113	120	60-130	6.05	30
Bis (2-ethylhexyl) Phthalate	0.059	0.066	0.062	94	105	60-130	11.2	30
4-Bromophenyl Phenyl Ether	1.1	1.1	1.25	89	91	60-130	2.43	30
Butylbenzyl Phthalate	0.066	0.073	0.062	106	116	60-130	9.03	30
4-Chloro-3-methylphenol	1.2	1.2	1.25	96	97	70-130	0.887	30
4-Chloroaniline	0.046	0.048	0.062	73	76	40-130	4.53	30
2-Chloronaphthalene	1.2	1.2	1.25	97	97	60-130	0.216	30
2-Chlorophenol	0.057	0.062	0.062	91	99	60-130	7.89	30
4-Chlorophenyl Phenyl Ether	1.2	1.2	1.25	97	96	70-130	0.673	30
Chrysene	0.061	0.063	0.062	98	100	70-130	2.86	30
Dibenzo (a,h) anthracene	0.054	0.056	0.062	87	89	70-130	3.05	30
Dibenzofuran	0.061	0.062	0.062	98	100	60-130	1.37	30
Di-n-butyl Phthalate	0.059	0.063	0.062	95	101	60-130	6.33	30
1,2-Dichlorobenzene	1.0	1.0	1.25	82	84	60-130	2.22	30
1,3-Dichlorobenzene	1.0	1.0	1.25	81	83	60-130	2.28	30
1,4-Dichlorobenzene	1.0	1.1	1.25	83	86	60-130	3.59	30
3,3-Dichlorobenzidine	0.045	0.050	0.062	72	80	40-130	11.0	30
2,4-Dichlorophenol	0.067	0.069	0.062	107	110	60-130	2.57	30
Diethyl Phthalate	0.063	0.064	0.062	100	103	70-130	2.71	30
2,4-Dimethylphenol	1.3	1.3	1.25	102	104	70-130	2.05	30
Dimethyl Phthalate	0.061	0.063	0.062	98	100	70-130	2.35	30
4,6-Dinitro-2-methylphenol	4.5	4.9	6.25	72	79	20-130	9.72	30

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/10/2024	**BatchID:**	295353
Date Analyzed:	06/10/2024	**Extraction Method:**	SW3550B
Instrument:	GC47	**Analytical Method:**	SW8270E
Matrix:	Soil	**Unit:**	mg/Kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295353

QC Summary Report for SW8270E

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
2,4-Dinitrophenol	0.70	0.79	1.25	56	64	15-130	13.2	30
2,4-Dinitrotoluene	0.064	0.066	0.062	102	105	70-130	3.32	30
2,6-Dichlorophenol	0.059	0.061	0.062	94	98	60-130	3.66	30
2,6-Dinitrotoluene	0.062	0.065	0.062	99	104	60-130	4.10	30
Di-n-octyl Phthalate	1.3	1.4	1.25	104	111	60-130	6.22	30
1,2-Diphenylhydrazine	1.2	1.3	1.25	99	100	60-130	1.16	30
Fluoranthene	0.060	0.061	0.062	96	98	70-130	1.82	30
Fluorene	0.068	0.066	0.062	108	106	60-130	2.35	30
Hexachlorobenzene	0.058	0.059	0.062	93	95	70-130	1.45	30
Hexachlorobutadiene	0.061	0.062	0.062	97	99	70-130	1.66	30
Hexachlorocyclopentadiene	5.5	5.7	6.25	88	91	60-130	2.82	30
Hexachloroethane	0.052	0.054	0.062	83	86	70-130	4.08	30
Indeno (1,2,3-cd) pyrene	0.055	0.057	0.062	87	92	70-130	4.94	30
Isophorone	1.1	1.2	1.25	89	98	60-130	9.66	30
1-Methylnaphthalene	0.063	0.064	0.062	100	102	70-130	1.75	30
2-Methylnaphthalene	0.064	0.065	0.062	102	104	70-130	2.22	30
2-Methylphenol (o-Cresol)	1.1	1.2	1.25	91	94	60-130	3.11	30
3 & 4-Methylphenol (m,p-Cresol)	1.2	1.2	1.25	94	96	60-130	1.67	30
Naphthalene	0.062	0.062	0.062	98	100	70-130	1.09	30
2-Nitroaniline	6.8	6.9	6.25	108	110	70-130	1.40	30
3-Nitroaniline	5.0	5.0	6.25	80	80	50-130	0.0116	30
4-Nitroaniline	6.0	6.0	6.25	96	96	60-130	0.290	30
Nitrobenzene	1.3	1.3	1.25	100	103	60-130	2.68	30
2-Nitrophenol	6.6	6.9	6.25	106	111	70-130	4.74	30
4-Nitrophenol	5.2	5.3	6.25	84	85	60-130	1.41	30
N-Nitrosodimethylamine	5.0	5.1	6.25	80	82	70-130	2.49	30
N-Nitrosodi-n-propylamine	1.0	1.1	1.25	83	87	60-130	4.47	30
N-Nitrosodiphenylamine	1.2	1.2	1.25	95	96	70-130	1.10	30
Pentachlorophenol	0.29	0.29	0.31	92	93	50-130	1.19	30
Phenanthrene	0.059	0.060	0.062	95	95	60-130	0.339	30
Phenol	0.23	0.24	0.25	93	97	60-130	4.10	30
Pyrene	0.070	0.072	0.062	113	115	70-130	2.31	30
Pyridine	0.85	0.82	1.25	68	66	60-130	2.82	30
2,3,4,6-Tetrachlorophenol	1.2	1.2	1.25	96	98	60-130	2.17	30
1,2,4-Trichlorobenzene	1.2	1.2	1.25	96	96	60-130	0.344	30
2,4,5-Trichlorophenol	0.065	0.067	0.062	103	108	60-130	4.02	30
2,4,6-Trichlorophenol	0.061	0.063	0.062	97	102	60-130	4.34	30

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/10/2024	**BatchID:**	295353
Date Analyzed:	06/10/2024	**Extraction Method:**	SW3550B
Instrument:	GC47	**Analytical Method:**	SW8270E
Matrix:	Soil	**Unit:**	mg/Kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295353

QC Summary Report for SW8270E

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Surrogate Recovery								
2-Fluorophenol	1.2	1.3	1.25	98	104	60-130	5.28	30
Phenol-d5	1.2	1.3	1.25	97	103	50-130	5.22	30
Nitrobenzene-d5	1.3	1.3	1.25	103	108	60-130	4.19	30
2-Fluorobiphenyl	1.3	1.3	1.25	102	105	60-130	2.59	30
2,4,6-Tribromophenol	1.3	1.3	1.25	102	103	50-130	0.487	30
4-Terphenyl-d14	1.4	1.4	1.25	114	116	50-130	1.71	30

Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/14/2024	**BatchID:**	295785
Date Analyzed:	06/17/2024	**Extraction Method:**	SW3050B
Instrument:	ICP-MS4	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295785 2406324-005AMS/MSD

QC Summary Report for Metals

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Antimony	ND	0.10	0.50	-	-	-
Arsenic	ND	0.084	0.50	-	-	-
Barium	ND	0.73	5.0	-	-	-
Beryllium	ND	0.086	0.50	-	-	-
Cadmium	ND	0.080	0.50	-	-	-
Chromium	ND	0.17	0.50	-	-	-
Cobalt	ND	0.063	0.50	-	-	-
Copper	ND	0.19	0.50	-	-	-
Lead	ND	0.089	0.50	-	-	-
Mercury	ND	0.039	0.050	-	-	-
Molybdenum	0.093,J	0.093	0.50	-	-	-
Nickel	ND	0.28	0.50	-	-	-
Selenium	ND	0.21	0.50	-	-	-
Silver	ND	0.084	0.50	-	-	-
Thallium	ND	0.073	0.50	-	-	-
Vanadium	ND	0.097	0.50	-	-	-
Zinc	ND	1.8	5.0	-	-	-
Surrogate Recovery						
Terbium	520			500	103	70-130

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/14/2024	**BatchID:**	295785
Date Analyzed:	06/17/2024	**Extraction Method:**	SW3050B
Instrument:	ICP-MS4	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295785 2406324-005AMS/MSD

QC Summary Report for Metals

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Antimony	49	48	50	98	97	75-125	1.19	20
Arsenic	52	51	50	103	103	75-125	0.259	20
Barium	500	500	500	100	100	75-125	0.128	20
Beryllium	51	51	50	102	102	75-125	0.141	20
Cadmium	51	51	50	102	102	75-125	0.0925	20
Chromium	52	51	50	104	102	75-125	2.27	20
Cobalt	51	52	50	103	103	75-125	0.505	20
Copper	53	53	50	105	105	75-125	0.103	20
Lead	51	51	50	102	102	75-125	0.125	20
Mercury	1.3	1.3	1.25	100	101	75-125	1.03	20
Molybdenum	50	50	50	99	99	75-125	0.0949	20
Nickel	52	51	50	104	103	75-125	1.60	20
Selenium	51	51	50	103	103	75-125	0.0429	20
Silver	48	48	50	95	96	75-125	0.434	20
Thallium	51	52	50	102	103	75-125	1.60	20
Vanadium	52	52	50	103	103	75-125	0.0562	20
Zinc	520	520	500	104	104	75-125	0.346	20
Surrogate Recovery								
Terbium	530	530	500	105	106	70-130	0.528	20

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Antimony	1	49	48	50	ND	97	96	75-125	1.53	20
Arsenic	1	52	54	50	2.627	100	102	75-125	2.54	20
Barium	1	2200	2300	500	1531	129,F10	157,F10	75-125	6.40	20
Beryllium	1	47	48	50	0.7110	93	94	75-125	1.13	20
Cadmium	1	51	50	50	ND	102	101	75-125	1.30	20
Chromium	1	110	120	50	68.98	91	94	75-125	1.52	20
Cobalt	1	61	58	50	12.27	98	92	75-125	4.96	20
Copper	1	240	240	50	177.0	122	117	75-125	0.953	20
Lead	1	60	60	50	8.243	103	103	75-125	0.0785	20
Mercury	1	1.4	1.5	1.25	0.1450	102	108	75-125	5.35	20
Molybdenum	1	50	49	50	ND	99	98	75-125	1.13	20
Nickel	1	160	160	50	107.3	106	100	75-125	1.93	20
Selenium	1	51	50	50	0.5750	100	100	75-125	0.388	20
Silver	1	47	48	50	ND	94	95	75-125	0.765	20

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/14/2024	**BatchID:**	295785
Date Analyzed:	06/17/2024	**Extraction Method:**	SW3050B
Instrument:	ICP-MS4	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295785 2406324-005AMS/MSD

QC Summary Report for Metals

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Thallium	1	52	51	50	ND	104	101	75-125	3.08	20
Vanadium	1	120	130	50	63.83	104	129,F10	75-125	10.5	20
Zinc	1	590	580	500	64.25	104	103	75-125	1.12	20
Surrogate Recovery										
Terbium	1	530	530	500		106	106	70-130	0.370	20

Analyte	DLT Result	DLTRef Val	%D	%D Limit
Antimony	ND<2.5	ND	100	-
Arsenic	2.6	2.6	0.0761	-
Barium	1400	1500	5.51	20
Beryllium	ND<2.5	0.71	0.141	-
Cadmium	ND<2.5	ND		-
Chromium	72	69	5.11	20
Cobalt	13	12	5.91	20
Copper	180	180	0.802	20
Lead	7.9	8.2	4.65	-
Mercury	ND<0.25	0.15	100	-
Molybdenum	ND<2.5	ND	142	-
Nickel	110	110	0.998	20
Selenium	ND<2.5	0.58	100	-
Silver	ND<2.5	ND		-
Thallium	ND<2.5	ND	100	-
Vanadium	67	64	4.81	20
Zinc	61	64	5.35	-

%D Control Limit applied to analytes with concentrations greater than 25 times the reporting limits.

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/14/2024	**BatchID:**	295779
Date Analyzed:	06/14/2024	**Extraction Method:**	ASTM D2216
Instrument:	WetChem	**Analytical Method:**	SW8000
Matrix:	Soil	**Unit:**	wet wt%
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB-295779 2406324-005A

QC Summary Report for Percent Moisture

Analyte	MB Result	MDL	RL			
% Moisture	ND	0.100	0.100	-	-	-

Analyte	SAMP Result	DUP Result	RPD	RPD Limit
% Moisture	10.7	10.2	4.50	15

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/06/2024	**BatchID:**	295173
Date Analyzed:	06/10/2024	**Extraction Method:**	SW3550B
Instrument:	GC6B	**Analytical Method:**	SW8015B
Matrix:	Soil	**Unit:**	mg/Kg
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295173

QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
TPH-Diesel (C10-C23)	ND	1.1	2.0	-	-	-
TPH-Motor Oil (C18-C36)	ND	4.3	10	-	-	-
Surrogate Recovery						
C9	22			25	90	70-130

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	35	37	40	88	93	70-130	6.44	20
Surrogate Recovery								
C9	23	23	25	93	94	70-130	0.375	20

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CHAIN-OF-CUSTODY RECORD

WorkOrder: 2406324 **ClientCode: ENGE**

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☐ Detection Summary ☑ Excel []

Report to:
Scott Johns
ENGEO Incorporated
2010 Crow Canyon Place, Ste 250
San Ramon, CA 94583-4634
(925) 866-9000 FAX: 888-279-2698

Email: sjohns@engeo.com
cc/3rd Party:
PO:
Project: 16484.001.001; Scotts Valley Development

Bill to:
Chantelle Maloney
ENGEO Incorporated
2010 Crow Canyon Place, Ste 250
San Ramon, CA 94583-4634
AP@engeo.com; cmaloney@engeo.co

Requested TAT: **5 days;**

Date Received: **06/05/2024**
Date Logged: **06/06/2024**

Lab ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
2406324-001	Tailings C S1	Soil	6/5/2024 13:30	☐	A	A	A	A	A	A	A	A				
2406324-002	Tailings C S2	Soil	6/5/2024 13:45	☐	A	A	A	A	A	A	A	A				
2406324-003	Tailings C S3	Soil	6/5/2024 14:02	☐	A	A	A	A	A	A	A	A				
2406324-004	Tailings C S4	Soil	6/5/2024 14:14	☐	A	A	A	A	A	A	A	A				

Test Legend:

1	8081PCB_S	2	8260_S	3	8260GAS_S	4	8270_SCSM_S
5	CAM17MS_TTLC_S	6	PRDisposal Fee	7	STLC_MSEXTRACTONLY	8	TPH(DMO)_S
9		10		11		12	

Prepared by: Agustina Venegas

The following SampIDs: 001A, 002A, 003A, 004A contain testgroup Gas8260_S.

Comments:

NOTE: Soil samples are discarded 60 days after receipt unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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WORK ORDER SUMMARY

Client Name: ENGEO INCORPORATED **Project:** 16484.001.001; Scotts Valley Development **Work Order:** 2406324
Client Contact: Scott Johns **QC Level:** LEVEL 2
Contact's Email: sjohns@engeo.com **Comments:** **Date Logged:** 6/6/2024

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LabID	ClientSampID	Matrix	Test Name	Cont./ Comp.	Bottle & Preservative	U**	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	Sub Out
001A	Tailings C S1	Soil	SW8015B (Diesel & Motor Oil)	1	Stainless Steel tube 2"x6"	☐	☐	☐	6/5/2024 13:30	5 days	6/12/2024		☐	☐
			STLC Extract and Hold			☐	☐	☐		5 days*	6/12/2024		☐	☐
			SW6020 (CAM 17)			☐	☐	☐		5 days	6/12/2024		☐	☐
			SW8270E (SVOCs)			☐	☐	☐		5 days	6/12/2024		☐	☐
			TPH(g) & 8260 by P&T GCMS			☐	☐	☐		5 days	6/12/2024		☐	☐
			SW8081B/8082A (OC Pesticides+PCBs)			☐	☐	☐		5 days	6/12/2024		☐	☐
002A	Tailings C S2	Soil	SW8015B (Diesel & Motor Oil)	1	Stainless Steel tube 2"x6"	☐	☐	☐	6/5/2024 13:45	5 days	6/12/2024		☐	☐
			STLC Extract and Hold			☐	☐	☐		5 days*	6/12/2024		☐	☐
			SW6020 (CAM 17)			☐	☐	☐		5 days	6/12/2024		☐	☐
			SW8270E (SVOCs)			☐	☐	☐		5 days	6/12/2024		☐	☐
			TPH(g) & 8260 by P&T GCMS			☐	☐	☐		5 days	6/12/2024		☐	☐

NOTES: * STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- ISM prep requires 5 to 10 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 6 to 11 days from sample submission). Due date listed on WO summary will not accurately reflect the time needed for sample preparation.

- Organic extracts are held for 40 days before disposal; Inorganic extract are held for 30 days.

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

U = An unpreserved container was received for a method that suggests a preservation in order to extend hold time for analysis.**

Cont./Comp. = Containers /Composites

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WORK ORDER SUMMARY

Client Name: ENGEO INCORPORATED **Project:** 16484.001.001; Scotts Valley Development **Work Order:** 2406324
Client Contact: Scott Johns **QC Level:** LEVEL 2
Contact's Email: sjohns@engeo.com **Comments:** **Date Logged:** 6/6/2024

☐ WaterTrax ☐ CLIP ☐ EDF ☑ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

LabID	ClientSampID	Matrix	Test Name	Cont./ Comp.	Bottle & Preservative	U**	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	Sub Out
002A	Tailings C S2	Soil	SW8081B/8082A (OC Pesticides+PCBs)	1	Stainless Steel tube 2"x6"	☐	☐	☐	6/5/2024 13:45	5 days	6/12/2024		☐	☐
003A	Tailings C S3	Soil	SW8015B (Diesel & Motor Oil)	1	Stainless Steel tube 2"x6"	☐	☐	☐	6/5/2024 14:02	5 days	6/12/2024		☐	☐
			STLC Extract and Hold			☐	☐	☐		5 days*	6/12/2024		☐	☐
			SW6020 (CAM 17)			☐	☐	☐		5 days	6/12/2024		☐	☐
			SW8270E (SVOCs)			☐	☐	☐		5 days	6/12/2024		☐	☐
			TPH(g) & 8260 by P&T GCMS			☐	☐	☐		5 days	6/12/2024		☐	☐
			SW8081B/8082A (OC Pesticides+PCBs)			☐	☐	☐		5 days	6/12/2024		☐	☐
004A	Tailings C S4	Soil	SW8015B (Diesel & Motor Oil)	1	Stainless Steel tube 2"x6"	☐	☐	☐	6/5/2024 14:14	5 days	6/12/2024		☐	☐
			STLC Extract and Hold			☐	☐	☐		5 days*	6/12/2024		☐	☐
			SW6020 (CAM 17)			☐	☐	☐		5 days	6/12/2024		☐	☐
			SW8270E (SVOCs)			☐	☐	☐		5 days	6/12/2024		☐	☐

NOTES: * STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

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WORK ORDER SUMMARY

Client Name: ENGEO INCORPORATED | **Project:** 16484.001.001; Scotts Valley Development | **Work Order:** 2406324

Client Contact: Scott Johns | **QC Level:** LEVEL 2

Contact's Email: sjohns@engeo.com | **Comments:** | **Date Logged:** 6/6/2024

☐ WaterTrax ☐ CLIP ☐ EDF ☑ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

LabID	ClientSampID	Matrix	Test Name	Cont./ Comp.	Bottle & Preservative	U**	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	Sub Out
004A	Tailings C S4	Soil	TPH(g) & 8260 by P&T GCMS	1	Stainless Steel tube 2"x6"	☐	☐	☐	6/5/2024 14:14	5 days	6/12/2024		☐	☐
			SW8081B/8082A (OC Pesticides+PCBs)			☐	☐	☐		5 days	6/12/2024		☐	☐

NOTES: * STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

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Cont./Comp. = Containers /Composites

CHAIN OF CUSTODY RECORD

2406324

PROJECT NUMBER:	PROJECT NAME:
16484.001.001	Scotts Valley Developoment

SAMPLED BY: (SIGNATURE/PRINT) [signature] / Lars Beeson

PROJECT MANAGER: Scott Johns

ROUTING: E-MAIL sjohns@engeo.com Hard Copy NA

SAMPLE NUMBER	DATE	TIME	MATRIX	NUMBER OF CONTAINERS	CONTAINER SIZE	PRESERVATIVE	VOCs + TPHgas (8260B)	TPH-diesel and -motor oil (8015M)	SVOCs (8270)	OCPs (8081)	PCBs (8082)	CAM 17 Metals (6010)	STLC Extraction and HOLD	REMARKS REQUIRED DETECTION LIMITS
Tailings C S1	6/5/2024	1:30	Soil	1	Liner	Ice								
Tailings C S2	6/5/2024	1:45	Soil	1	Liner	Ice	X	X	X	X	X	X	X	
Tailings C S3	6/5/2024	2:02	Soil	1	Liner	Ice								
Tailings C S4	6/5/2024	2:14	Soil	1	Liner	Ice								

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	6/5/24 4:01	[signature] 6/5/24 1601			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
			J. Owen		

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
				Standard 5-day TAT. Discrete

ENGEO INCORPORATED

2010 CROW CANYON PLACE, SUITE 250
SAN RAMON, CALIFORNIA 94583
(925) 866-9000 FAX (888) 279-2698
WWW.ENGEO.COM

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Sample Receipt Checklist

Client Name:	ENGEO Incorporated	Date and Time Received:	6/5/2024 16:04
Project:	16484.001.001; Scotts Valley Development	Date Logged:	6/6/2024
		Received by:	Lilly Ortiz
WorkOrder №:	2406324 Matrix: Soil	Logged by:	Agustina Venegas
Carrier:	Client Drop-In		

Chain of Custody (COC) Information

	Yes	No	NA
Chain of custody present?	✔	☐	
Chain of custody signed when relinquished and received?	✔	☐	
Chain of custody agrees with sample labels?	✔	☐	
Sample IDs noted by Client on COC?	✔	☐	
Date and Time of collection noted by Client on COC?	✔	☐	
Sampler's name noted on COC?	✔	☐	
COC agrees with Quote?	☐	☐	✔

Sample Receipt Information

	Yes	No	NA
Custody seals intact on shipping container/cooler?	☐	☐	✔
Custody seals intact on sample bottles?	☐	☐	✔
Shipping container/cooler in good condition?	✔	☐	
Samples in proper containers/bottles?	✔	☐	
Sample containers intact?	✔	☐	
Sufficient sample volume for indicated test?	✔	☐	

Sample Preservation and Hold Time (HT) Information

	Yes	No	NA
All samples received within holding time?	✔	☐	☐
Samples Received on Ice? (Ice Type: WET ICE)	✔	☐	
Sample/Temp Blank temperature	Temp: 1°C		☐
ZHS conditional analyses: VOA meets zero headspace requirement (VOCs, TPHg/BTEX, RSK)?	☐	☐	✔
Sample labels checked for correct preservation?	✔	☐	
pH acceptable upon receipt (Metal: <2)?	☐	☐	✔

UCMR Samples:

	Yes	No	NA
pH tested and acceptable upon receipt (200.7: ≤2; 533: 6 - 8; 537.1: 6 - 8)?	☐	☐	✔
Free Chlorine tested and acceptable upon receipt (<0.1mg/L) [not applicable to 200.7]?	☐	☐	✔

Comments:

McCampbell Analytical, Inc.

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Analytical Report

WorkOrder: 2406324 B

Report Created for: ENGEO Incorporated

2010 Crow Canyon Place, Ste 250
San Ramon, CA 94583-4634

Project Contact: Scott Johns
Project P.O.:
Project: 16484.001.001; Scotts Valley Development

Project Location:
Project Received: 06/05/2024

Analytical Report reviewed & approved for release on 06/19/2024 by:

Christine Askari
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in a case narrative.

NELAP ACCREDITED TNI LABORATORY

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Glossary of Terms & Qualifier Definitions

Client: ENGEO Incorporated **WorkOrder:** 2406324 B

Project: 16484.001.001; Scotts Valley Development

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
CCV	Continuing Calibration Verification.
CCV REC (%)	% recovery of Continuing Calibration Verification.
CPT	Consumer Product Testing not NELAP Accredited
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LCS2	Second LCS for the batch. Spike level is lower than that for the first LCS; applicable to method 1633.
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit [1]
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit [2]
RPD	Relative Percent Difference
RRT	Relative Retention Time
RSD	Relative Standard Deviation
SNR	Surrogate is diluted out of the calibration range
SPK Val	Spike Value

[1] MDL is the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results. Definition and Procedure for the Determination of the Method Detection Limit, Revision 2, 40CFR, Part 136, Appendix B, EPA 821-R-16-006, December 2016. Values are based upon our default extraction volume/amount and are subject to change.

[2] RL is the lowest level that can be reliably determined within specified limits of precision and accuracy during routine laboratory operating conditions. (The RL cannot be lower than the lowest calibration standard used in the initial calibration of the instrument and must be greater than the MDL.) Values are based upon our default extraction volume/amount and are subject to change.

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Glossary of Terms & Qualifier Definitions

Client: ENGEO Incorporated **WorkOrder:** 2406324 B

Project: 16484.001.001; Scotts Valley Development

SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TNTC	“Too Numerous to Count;” greater than 250 colonies observed on the plate.
TZA	TimeZone Net Adjustment for sample collected outside of MAI's Coordinated Universal Time (UTC). (Adjustment for Daylight Saving is not accounted.)
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

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Analytical Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Received:	06/05/2024 16:04	**Extraction Method:**	CA Title 22
Date Prepared:	06/15/2024	**Analytical Method:**	SW6020
Project:	16484.001.001; Scotts Valley Development	**Unit:**	mg/L

Metals (STLC)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Tailings C S1,2,3,4	**2406324-005A**	**Soil**	**06/06/2024 14:14**	**ICP-MS6 117SMPL.d**	**295823**

Analytes	Result	RL	DF	Date Analyzed
Barium	**39**	1.0	1	06/18/2024 15:48
Chromium	ND	0.10	1	06/18/2024 15:48

Analyst(s): MIG

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Quality Control Report

Client:	ENGEO Incorporated	**WorkOrder:**	2406324
Date Prepared:	06/15/2024	**BatchID:**	295823
Date Analyzed:	06/17/2024	**Extraction Method:**	CA Title 22
Instrument:	ICP-MS4	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/L
Project:	16484.001.001; Scotts Valley Development	**Sample ID:**	MB/LCS/LCSD-295823

QC Summary Report for Metals (STLC)

Analyte	MB Result	MDL	RL			
Barium	ND	1.0	1.0	-	-	-
Chromium	ND	0.10	0.10	-	-	-

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Barium	98	99	100	98	99	75-125	1.48	20
Chromium	9.8	9.9	10	98	99	75-125	0.0690	20

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CHAIN-OF-CUSTODY RECORD

WorkOrder: 2406324 **B** **ClientCode: ENGE**

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☐ Detection Summary ☑ Excel []

Report to:
Scott Johns
ENGEO Incorporated
2010 Crow Canyon Place, Ste 250
San Ramon, CA 94583-4634
(925) 866-9000 FAX: 888-279-2698

Email: sjohns@engeo.com
cc/3rd Party:
PO:
Project: 16484.001.001; Scotts Valley Development

Bill to:
Chantelle Maloney
ENGEO Incorporated
2010 Crow Canyon Place, Ste 250
San Ramon, CA 94583-4634
AP@engeo.com; cmaloney@engeo.co

Requested TAT: **1 day;**

Date Received: **06/05/2024**
Date Logged: **06/06/2024**
Date Add-On: **06/18/2024**

Lab ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
2406324-005	Tailings C S1,2,3,4	Soil	6/6/2024 14:14	☐	A											

Test Legend:

1	METALSMS_STLC_S	2		3		4	
5		6		7		8	
9		10		11		12	

Prepared by: Agustina Venegas

Add-On Prepared By: Maria Venegas

Comments: 4pt Comp added for CAM17, STLC Extraction, percent moisture 6/13/24 Rush TAT. STLC Cr,Ba added to 005 6/18/24 Rush TAT.

NOTE: Soil samples are discarded 60 days after receipt unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

WORK ORDER SUMMARY

Client Name: ENGEO INCORPORATED
Client Contact: Scott Johns
Contact's Email sjohns@engeo.com

Project: 16484.001.001; Scotts Valley Development

Comments: 4pt Comp added for CAM17, STLC Extraction, percent moisture 6/13/24 Rush TAT. STLC Cr,Ba added to 005 6/18/24 Rush TAT.

Work Order: 2406324
QC Level: LEVEL 2
Date Logged: 6/6/2024
Date Add-On: 6/18/2024

LabID	ClientSampID	Matrix	Test Name	Cont. /Comp	Bottle & Preservative	U**	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	Sub Out
005A	Tailings C S1,2,3,4	Soil	SW6020 (Metals) (STLC) <Barium, Chromium>	4 / (4:1)	Stainless Steel tube 2"x6"	☐	☐	☐	6/6/2024 14:14	1 day*	6/21/2024		☐	☐

NOTES: *** STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).**

- ISM prep requires 5 to 10 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 6 to 11 days from sample submission). Due date listed on WO summary will not accurately reflect the time needed for sample preparation.

- Organic extracts are held for 40 days before disposal; Inorganic extract are held for 30 days.

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

U = An unpreserved container was received for a method that suggests a preservation in order to extend hold time for analysis.**

Cont. / Comp. = Containers /Composites

CHAIN OF CUSTODY RECORD

2406324

PROJECT NUMBER: 16484.001.001
PROJECT NAME: Scotts Valley Developoment
SAMPLED BY: (SIGNATURE/PRINT) [signature] / Lucas Beeson
PROJECT MANAGER: Scott Johns
ROUTING: E-MAIL: sjohns@engeo.com   Hard Copy: NA

SAMPLE NUMBER	DATE	TIME	MATRIX	NUMBER OF CONTAINERS	CONTAINER SIZE	PRESERVATIVE	VOCs + TPHgas (8260B)	TPH-diesel and -motor oil (8015M)	SVOCs (8270)	OCPs (8081)	PCBs (8082)	CAM 17 Metals (6010)	STLC Extraction and HOLD	4pt COMP	CAM17	STLC Ba,Cr	REMARKS REQUIRED DETECTION LIMITS
Tailings C S1	6/5/2024	1:30	Soil	1	Liner	Ice	X	X	X	X	X	X	X				
Tailings C S2	6/5/2024	1:45	Soil	1	Liner	Ice											
Tailings C S3	6/5/2024	2:02	Soil	1	Liner	Ice											
Tailings C S4	6/5/2024	2:14	Soil	1	Liner	Ice											

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	6/5/24 4:01	[signature]	6/5/24 1601		

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
			J. Owen		

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS
				Standard 5-day TAT. Discrete 4pt Comp CAM17 6/13/24 RUSH

ENGEO INCORPORATED

2010 CROW CANYON PLACE, SUITE 250
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(925) 866-9000 FAX (888) 279-2698
WWW.ENGEO.COM

DISTRIBUTION: ORIGINAL ACCOMPANIES SHIPMENT, COPY TO PROJECT FIELD FILES

Added 6/18/24 RUSH