FINAL TRIBAL ENVIRONMENTAL IMPACT REPORT

GRATON RESORT & CASINO EXPANSION PROJECT

MAY 2023

LEAD AGENCY:

Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
(707) 566-2288
www.gratonteir.com

FINAL TRIBAL ENVIRONMENTAL IMPACT REPORT

GRATON RESORT & CASINO EXPANSION PROJECT

MAY 2023

LEAD AGENCY:

Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
(707) 566-2288
www.gratonteir.com

GRATON RESORT & CASINO

PREPARED BY:

AES-Montrose
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479
www.aes-montrose.com

AES

TABLE OF CONTENTS

GRATON RESORT & CASINO EXPANSION PROJECT
FINAL TRIBAL ENVIRONMENTAL IMPACT REPORT

FIGURES

APPENDICES

SECTION 1.0

EXECUTIVE SUMMARY

1.1 PROJECT SUMMARY

The Federated Indians of Graton Rancheria (Tribe) proposes to enhance the existing Graton Resort & Casino (Resort) with the construction of the Graton Resort & Casino Expansion Project (Proposed Project). The Proposed Project will be developed consistent with federal law, the Tribal-State Compact (Compact) ~~between~~ executed by the Tribe and the State of California in 2012 and amended in 2017, and the agreements between the Tribe and Sonoma County and the City of Rohnert Park. The Proposed Project includes the development of additional hotel accommodations, an expanded casino floor, a rooftop restaurant, an expanded swimming pool area, an additional parking structure, a theatre, additional back-of-house, mezzanine, and support space, stormwater detention modifications, minor re-alignment to Labath Avenue within the existing Resort parking lot, and modifications to the on-site central utility plant.

1.2 ISSUES OF CONCERN

The Off-reservation Environmental Impact Analysis Checklist (**Appendix A**) identifies environmental issue areas to be considered pursuant to the Compact, if applicable.[1] A Notice of Preparation (NOP) for the Proposed Project (**Appendix B**) was issued on April 4, 2022, initiating a 30-day comment period that closed on May 4, 2022. Comment letters were received on the NOP from the Native American Heritage Commission (NAHC), County of Sonoma, City of Rohnert Park, Santa Rosa Plain Groundwater Sustainability Agency, Sonoma County Fire District, and members of the general public (**Appendix C**). Concerns expressed included impacts associated with transit and traffic, water resources and stormwater/wastewater management, greenhouse gas emissions and energy, groundwater use, noise, hazards and emergency services, housing, and biological resources. These and other concerns were considered in the preparation of the~~is~~ Draft Tribal Environmental Impact Report (Draft TEIR). Potentially significant off-reservation environmental impacts are addressed in **Section 4.0**. Mitigation is proposed where warranted.

A Notice of Availability for the Draft TEIR was published in the *Press Democrat* on December 19, 2022, and the Draft TEIR was also submitted to the State Clearinghouse the same day. This initiated a 45-day public comment period, during which time written comments regarding the Draft TEIR were accepted through February 1, 2023. An extension of the public comment period was granted through February 8, 2023 upon the request of Sonoma County. Three comment letters were received: from the County of Sonoma and Sonoma County Water Agency, the City of Rohnert Park, and the Santa Rosa Plain Groundwater Sustainability Agency. Copies of comment letters are provided in **Appendix I** and responses to each relevant comment received are provided in **Appendix J.** Revisions have been made to this Final TEIR in response to the comment letters received as warranted.

[1] The Tribal-State Compact between the Federated Indians of Graton Rancheria and the State of California was deemed approved by the Secretary of Interior "but only to the extent that the Compact is consistent with the provisions of [IGRA] 25 U.S.C. § 2710(d)(8)(C)." The Tribe's compliance with the TEIR process set forth in section 11.0 of the Compact is voluntary and shall not be deemed or construed as conceding the enforceability of Section 11.0 of the Compact.

1.3 NO PROJECT ALTERNATIVE

Under the No Project Alternative, further discussed in **Section 3.4**, the Resort would not be expanded or substantially modified and would continue to operate in its current form and capacity. Under the No Project Alternative, the project site would continue to operate as surface parking for the existing Resort.

1.4 ENVIRONMENTAL IMPACTS AND MITIGATION

Section 4.0 addresses potentially significant off-reservation environmental impacts of the Proposed Project and discusses feasible mitigation measures, taking into consideration off-reservation jurisdictional constraints. With implementation of the recommended mitigation measures, potentially significant off-reservation impacts would be reduced to less-than-significant levels. **Table 1-1** presents a summary of potential off-reservation environmental impacts of the Proposed Project and recommended mitigation measures that would allow avoidance or reduction of identified off-reservation impacts.

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
4.2 AESTHETICS			
4.2-1	The Proposed Project could significantly affect -off-reservation scenic vistas.	None	Less than Significant
4.2-2	The Proposed Project could significantly damage off-reservation scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	None	No Impact
4.2-3	The Proposed Project could create a new source of light or glare that may substantially impact day or nighttime views of historic buildings or views in the area.	None	Less than Significant
4.3 AIR QUALITY			
4.3-1	The Proposed Project could conflict with or obstruct implementation of applicable air quality plans.	None	Less than Significant
4.3-2	The Proposed Project could violate an air quality standard or contribute to an existing or projected air quality violation.	**4.3-1** - The Tribe shall require off-road construction equipment to utilize tier 3 engines as defined by the USEPA's Vehicle Emission and Fuel Standards Program. In addition, construction equipment shall be operated with a level 3 diesel particulate filter. - Exposed soil shall be sprayed with water or other suppressant at least twice a day or as needed. - Dust emissions shall be minimized during transport of fill material or soil by wetting-down loads, ensuring adequate freeboard (space from the top of the material to the top of the truck bed) on trucks, and/or covering loads. - Dirt, gravel, and debris piles shall be covered as needed to reduce dust and wind-blown debris. - A 15 mile per hour speed limit shall be enforced on unpaved roads. - CAPs, GHG, and DPM emissions shall be minimized during operation of the Proposed Project by requiring that diesel-powered vehicles and equipment be properly maintained and minimizing idling time to five minutes at loading docks when loading or unloading food, merchandise, etc. or when diesel-powered vehicles or equipment are not in use; unless per engine	Less than Significant

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
		manufacturer's specifications or for safety reasons more time is required. - The Tribe shall encourage turning off bus engines instead of idling for extended periods during operation of the Proposed Project. - Adequate ingress and egress at entrances shall be maintained to minimize vehicle idling and traffic congestion. - To the extent feasible, the Proposed Project shall utilize super compliant low volatile organic compounds (VOC) for architectural coatings. - To the extent feasible, recycling bins shall be installed throughout the Resort for glass, cans, and paper products. Trash and recycling receptacles shall be placed strategically outside to encourage people to recycle. In addition, to the extent feasible, the Tribe shall promote the use of non-polystyrene take-out containers and encourage food waste composting programs at restaurants. - The Proposed Project shall use energy-efficient lighting and appliances to the extent feasible, which would reduce indirect CAP and GHG emissions. - The Tribe shall consider and, to the extent feasible, incorporate preferential parking for Plug-In Electric Vehicles, along with the installation of corresponding electric vehicle charging stations into the design of the Proposed Project. ~~None~~	
4.3-3	The Proposed Project could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).	None	Less than Significant
4.3-4	The Proposed Project could expose off-reservation sensitive receptors to substantial pollutant concentrations.	Refer to **Mitigation Measure 4.3-1** ~~None~~	Less than Significant
4.3-5	The Proposed Project could create objectionable odors affecting a substantial number of people off-reservation.	None	Less than Significant

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
4.4 BIOLOGICAL RESOURCES			
4.4-1	The Proposed Project could have a substantial adverse impact, either directly or through habitat modifications, on any species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	**4.4-1** - Silt fencing shall be placed along the edge of the project site to serve as CTS exclusionary fencing during construction of the Proposed Project, and will also serve to protect on and off-reservation wetlands from indirect impacts. - The fencing protects against the take of CTS by preventing CTS from accessing the project site from the surrounding off-reservation critical habitat. - Fencing shall be 8 inches minimum in height, and installed in such a way as to not allow CTS to pass underneath it onto the project site. - CTS signage shall be placed around the project site, and a qualified biologist will periodically monitor the project site for the presence of CTS. **4.4-2** - Should construction activities take place during the nesting period (March 1 - September 30), a qualified biologist shall conduct a pre-construction survey for migratory bird and raptor nests within 500 feet of the project site. - The survey shall be conducted within ~~14~~ 5 days of the start of construction. - If construction activities are delayed or suspended for more than ~~14~~ 5 days after the pre-construction survey, the area shall be resurveyed. - If no active nests are identified, no further mitigation is necessary. - If active bird nests are identified, an avoidance buffer shall be implemented based on the identified species and as determined by a qualified biologist. Avoidance buffers may vary in size depending on habitat characteristics, project-related activities, and disturbance levels. Avoidance buffers shall remain in place until the end of the general nesting season or upon determination by a qualified biologist that young have fledged or the nest has failed.	Less than Significant

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
4.4-2	The Proposed Project could have a substantial adverse effect on any off-reservation riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	Refer to **Mitigation Measure 4.4-1**	Less than Significant
4.4-3	The Proposed Project could have a substantial impact on federally protected off-reservation wetlands as defined by Section 404 of the Clean Water Act.	Refer to **Mitigation Measure 4.4-1**	Less than Significant
4.4-4	The Proposed Project could interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	None	No Impact
4.4-5	The Proposed Project could conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.	None	No Impact
4.5 GEOLOGY AND SOILS			
4.5-1	The Proposed Project could expose off-reservation people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.	None	Less than Significant
4.5-2	The Proposed Project could expose off-reservation people or structures to substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking.	None	Less than Significant
4.5-3	The Proposed Project could expose off-reservation people or structures to substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction.	None	No Impact
4.5-4	The Proposed Project could expose off-reservation people or structures to substantial adverse effects, including the risk of loss, injury, or death involving landslides.	None	Less than Significant
4.5-5	The Proposed Project could result in substantial off-reservation soil erosion or the loss of topsoil**.**	Refer to **Mitigation Measure 4.4-1**	Less than Significant
4.6 GREENHOUSE GAS EMISSIONS			
4.6-1	The Proposed Project could generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the off-reservation environment.	Refer to **Mitigation Measure 4.3-1** ~~None~~	Less than Significant

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
4.6-2	The Proposed Project could conflict with any off-reservation plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Refer to **Mitigation Measure 4.3-1** ~~None~~	Less than Significant
4.7 HAZARDS AND HAZARDOUS MATERIALS			
4.7-1	The Proposed Project could create a significant hazard to the off-reservation public or the off-reservation environment through the routine transport, use, or disposal of hazardous materials.	None	Less than Significant
4.7-2	The Proposed Project could create a hazard to the off-reservation public or the off-reservation environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	None	Less than Significant
4.7-3	The Proposed Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed off-reservation school.	None	Less than Significant
4.7-4	The Proposed Project could expose off-reservation people or structures to a significant risk of loss, injury or death involving wildland fires.	None	Less than Significant
4.8 WATER RESOURCES			
4.8-1	The Proposed Project could violate water quality standards or waste discharge requirements.	None	Less than Significant
4.8-2	The Proposed Project could substantially deplete off-reservation groundwater supplies or interfere substantially with groundwater recharge such that there could be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells could drop to a level which would not support existing land uses or planned uses for which permits have been granted).	**4.8-1** The Tribe shall continue to implement the ongoing groundwater monitoring program in the approximately 11 monitoring wells within two miles of the Resort. Groundwater measurement procedures and standard operating procedures shall be based on the following: California Statewide Groundwater Elevation Monitoring for Select Sonoma County Basins and Sub-Basins prepared by Sonoma Water; the DWR Groundwater Elevation Monitoring Guidelines; and the U.S. Geological Survey Quality-Assurance Plan for Groundwater Activities. Annual reports will be compiled in graphical format showing groundwater elevations at monitoring wells.	Less than Significant

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
		4.8-2 The Tribe shall implement a reclaimed water program on the reservation. The reclaimed water program shall consist of one of the options below, or a combination thereof, to reduce groundwater pumping of the Proposed Project by approximately 35 gpm. Purchase of Reclaimed Water Option The Tribe shall purchase and use reclaimed water from the City of Rohnert Park. The Tribe shall be responsible for constructing additional infrastructure on-reservation as needed to supplement the existing recycled water system. If this option is chosen, the JEPA shall be amended accordingly in coordination with the City. On-site Reclaimed Water Production Option A wastewater treatment facility shall be constructed to treat wastewater to a tertiary level for reclaimed water production. The Tribe shall be responsible for constructing additional infrastructure on-reservation as to supplement the existing recycled water system. The WWTP would be located near the existing WTP on an existing disturbed or paved surface. Underground Injection Option Recharge of the groundwater basin shall be explored through use of leach fields or other underground injection methods. Additional geotechnical studies would be required to estimate feasibility of recharge systems given the anticipated low permeability of on-site soils. **4.8-3** The Tribe shall amend the JEPA with the City to extend the timeline to utilize the Phase 2 allowance and accommodate wastewater of the Proposed Project. This does not include the parking garage, as this component of the Proposed Project would not generate wastewater.	

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
4.8-3	The Proposed Project could substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation off-site.	None	Less than Significant
4.8-4	The Proposed Project could substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding off-site.	None	No Impact
4.8-5	The Proposed Project could contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff off-reservation.	None	Less than Significant
4.8-6	The Proposed Project could place structures which would impede or redirect off-reservation flood flows within a 100-year flood hazard area.	None	No Impact
4.8-7	The Proposed Project could expose off-reservation people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	None	No Impact
4.9 LAND USE			
4.9-1	The Proposed Project could conflict with an off-reservation land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating an environmental effect.	None	No Impact
4.9-2	The Proposed Project could conflict with an applicable habitat conservation plan or natural community conservation plan covering off-reservation land.	None	No Impact
4.10 NOISE			
4.10-1	The Proposed Project could result in an exposure of off-reservation persons to noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	None	Less than Significant
4.10-2	The Proposed Project could result in exposure of off reservation persons to excessive groundborne vibration or groundborne noise levels.	None	Less than Significant
4.10-3	The Proposed Project could result in a substantial permanent increase in ambient noise levels in the off-reservation vicinity of the project.	None	Less than Significant
4.10-4	The Proposed Project could result in a substantial temporary or periodic increase in ambient noise levels in the off-reservation vicinity of the project.	None	Less than Significant

	Impact	Recommended Mitigation Measure	Level of Significance After Mitigation
4.11 POPULATION AND HOUSING			
4.11-1	The Proposed Project could induce substantial off-reservation population growth.	None	Less than Significant
4.11-2	The Proposed Project could displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere off-reservation.	None	Less than Significant
4.12 PUBLIC SERVICES			
4.12-1	The Proposed Project could result in substantial adverse physical impacts associated with the provision of new or physically altered off-reservation governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the off-reservation public services.	<u>**4.12-1**</u> <u>The Tribe will amend existing agreements with public service providers, including the City and County, to address proportional impacts of the Proposed Project to the extent impacts exceed existing mitigation already provided by the Tribe.</u> ~~None~~	Less than Significant
4.13 TRANSPORTATION			
4.13-1	The Proposed Project could 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 non-motorized 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.	~~None~~ <u>**4.13-4**</u> <u>Updated traffic counts shall be conducted at intersections and weekend conditions shall be re-assessed prior to the groundbreaking of the hotel/casino expansion and theater to confirm the findings of the Traffic Impact Study</u>~~TIS~~<u>. If impacts are significantly greater than those specified herein, mitigation shall be adjusted accordingly. Millbrae Avenue at Stony Point Road shall also be evaluated if future traffic counts indicate that significant impacts to this intersection may occur.</u>	Significant and Unavoidable
4.13-2	The Proposed Project could 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.	**4.13-1** The Tribe shall amend existing agreements with ~~the County~~ and City <u>and if necessary, the County,</u> to address proportional impacts of the Proposed Project on the intersection at the Golf Course Drive/US-101 southbound ramps. **4.13-2** Golf Course Drive shall be modified to allow for a dual westbound left turn movement.	Significant and Unavoidable

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
		4.13-3 The US 101 southbound off-ramp approach shall be restriped to have a shared center left-through-right lane that would allow for a dual right turn movement onto Golf Course Drive. Refer to Mitigation Measure 4.13-4. **4.13-5** To address potential post-event theater traffic impacts on weekends, the following measures are recommended. **1. Wilfred Avenue at Langner Avenue** – Manual traffic control shall be implemented for special events. **2. Golf Course Drive at Labath Avenue** – Manual traffic control for special events shall be conducted. **3. Golf Course Drive at Redwood Drive** – The eastbound right-turn lane shall be restriped to create an additional shared through/right lane. – A westbound right-turn pocket shall be constructed along a portion of the gas station frontage. **4. Golf Course Drive at the U.S. 101 Southbound Ramps** – A second southbound right turn lane shall be added. **5. Golf Course Drive at Commerce Boulevard** – Signal systems on Golf Course Drive shall be monitored and adjusted. – Signal timing capabilities shall be upgraded to accommodate special event traffic. **6. Commerce Boulevard at the U.S. 101 Northbound Ramps** – Left turn storage on the off-ramp shall be increased.	

Impact		Recommended Mitigation Measure	Level of Significance After Mitigation
4.13-3	The Proposed Project could substantially increase hazards to an off-reservation design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	None	No Impact
4.13-4	The Proposed Project could result in inadequate emergency access for off-reservation responders.	None	Less than Significant
4.14 UTILITIES AND SERVICE SYSTEMS			
4.14-1	The Proposed Project could exceed off-reservation wastewater treatment requirements of the applicable Regional Water Quality Control Board.	Refer to **Mitigation Measure 4.8-3** ~~None~~	Less than Significant
4.14-2	The Proposed Project could require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant off-reservation environmental effects.	Refer to **Mitigation Measure 4.8-3** ~~None~~	Less than Significant
4.14-3	The Proposed Project could require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant off-reservation environmental effects.	None	Less than Significant
4.14-4	The Proposed Project could result in a determination by an off-reservation wastewater treatment provider (if applicable), which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	Refer to **Mitigation Measure 4.8-3** ~~None~~	Less than Significant

SECTION 2.0

INTRODUCTION

2.1 BACKGROUND

The Graton Resort & Casino (Resort), owned by the Tribe, is operated pursuant to federal law and the Tribal-State Compact ~~between~~ <u>executed by</u> the Tribe and the State of California<u> in 2012 and amended in 2017</u> (Compact). The Resort, which opened in 2013, originally included gaming, dining, a parking garage, water treatment plant, and surface parking. The Resort was the subject of an exhaustive Environmental Impact Statement (EIS) review conducted pursuant to the National Environmental Policy Act, which was approved by federal agencies in 2010. A 200-room hotel and banquet facility, also analyzed in the EIS, was subsequently constructed and opened in 2016 as part of the Resort. In 2018, the Tribe issued a TEIR for an additional 200 hotel rooms and other amenities, however, for various reasons, the project was never constructed. The Tribe now proposes to enhance the Resort with the construction of the Graton Resort & Casino Expansion Project (Proposed Project). The Proposed Project includes the development of additional hotel accommodations, expanded casino floor, rooftop restaurant, expanded swimming pool area, back of house, mezzanine, and support space, additional parking structure, theatre, stormwater detention modifications, minor re-alignment to Labath Avenue within the existing casino parking lot, and modifications to the on-site central plant. The Proposed Project would provide the additional amenities necessary to support and meet patron demands.

The Compact requires the Tribe to prepare a Tribal Environmental Impact Report (TEIR) that analyzes potential off-reservation environmental impacts of the Proposed Project prior to expansion. According to the Compact, "reservation" refers to land held in federal trust for the Tribe (Compact, 2012).[1] Thus, "off-reservation" refers to locations outside of trust land. Environmental analysis herein has been conducted according to the Environmental Impact Analysis Checklist (Checklist) (**Appendix A**). This TEIR assesses the potential for significant off-reservation impacts to occur as a result of the Proposed Project, consistent with the Compact and the Checklist.

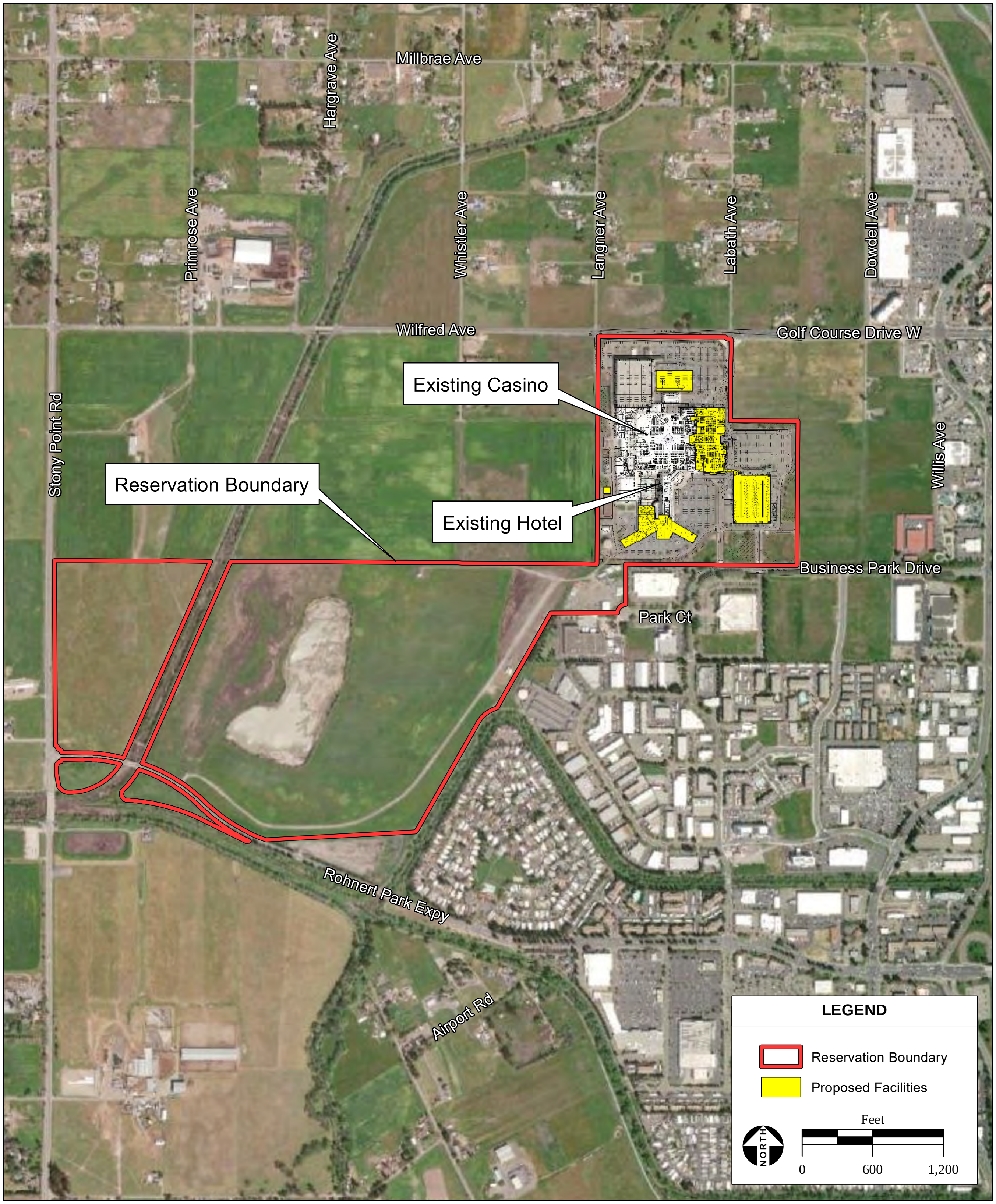
2.2 SETTING

The reservation is approximately 253-acres and located within the Santa Rosa Plain, west of Highway 101 and Rohnert Park, in unincorporated Sonoma County at 288 Golf Course Drive, Rohnert Park, California (**Figure 1**). The Resort is located in the northern portion of the reservation adjacent to and accessible from Wilfred Avenue/Golf Course Drive. The existing Resort includes gaming, dining, hotel, spa facilities, associated parking structure and lots, stormwater detention, and landscaped areas. The Resort is bounded by Wilfred Avenue/Golf Course Drive to the north, open space to the east and west, and Business Park Drive and commercial development to the south (**Figure 2**). Commercial development occurs further to east.

<u>[1] The Tribal-State Compact between the Tribe and the State was deemed approved by the Secretary of Interior "but only to the extent that the Compact is consistent with the provisions of]IGRA] 25 U.S.C. § 2710(d)(8)(C)." The Tribe's compliance with the TEIR process set forth in section 11.0 of the Compact is voluntary and shall not be deemed or construed as conceding the enforceability of Section 11.0 of the Compact.</u>

SOURCE: ESRI World Street Map, 2021; Montrose Environmental, 10/21/2022

Figure 1
Regional Location



SOURCE: Maxar aerial photograph, 4/16/2021; Montrose Environmental, 10/21/2022

Graton Resort & Casino Expansion Project / 203523 ■

Figure 2
Site and Vicinity

The area proposed for construction under the Proposed Project (project site) is currently developed as paved parking for the existing Resort (**Figure 2**). The project site is relatively flat with slopes of less than one percent and elevations ranging from approximately 85 feet above mean sea level (amsl) to 93 feet amsl. Construction and operation of the Proposed Project will utilize existing parking and other infrastructure already in place. The Proposed Project will connect to the existing hotel and casino facility.

2.3 TEIR PROCESS

This document was prepared in compliance with Sections 11.8.1 through 11.8.9 of the Compact, which requires a TEIR to be prepared before the commencement of a "project". A "project" is defined by Section 2.23 of the Compact to include any gaming-related activity occurring on Tribal land that may cause a direct or reasonably foreseeable indirect physical change in the off-reservation environment. This definition includes construction or planned expansion of any gaming facility and related improvement thereto, if the construction or expansion causes a potentially significant direct or indirect physical change in the off-reservation environment. The Proposed Project qualifies as a "project" under the Compact.

2.3.1 NOTICE OF PREPARATION

As required by Section 11.8.2 of the Compact, the Tribe issued a Notice of Preparation (NOP) (**Appendix B**) for the Proposed Project on April 4, 2022, initiating a 30-day comment period that closed on May 4, 2022. The NOP was submitted to the State Clearinghouse in the State Office of Planning and Research (State Clearinghouse), to the City of Rohnert Park, and to Sonoma County for distribution to interested parties. The NOP solicited comments on the Proposed Project and suggestions for potentially significant off-reservation environmental impacts that should be evaluated in the Draft TEIR.

Comment letters were received in response to the NOP (**Appendix C**) from the Native American Heritage Commission (NAHC), County of Sonoma, City of Rohnert Park, Santa Rosa Plain Groundwater Sustainability Agency, Sonoma County Fire District, and members of the public. Relevant comments were considered during the determination of the scope and preparation of the TEIR. Comments expressed concerns regarding project impacts on transportation and traffic, water resources and groundwater, stormwater management, greenhouse gas emissions and energy, noise, hazards and wildfire, land use, population and housing, public services, biological resources, and cumulative development. These concerns and others are addressed in **Section 4.0**.

A Notice of Availability for the Draft TEIR was published in the *Press Democrat* on December 19, 2022, and the Draft TEIR was also submitted to the State Clearinghouse on this day. The Draft TEIR was circulated to the Office of the Attorney General, California Gambling Control Commission, Sonoma County, and City of Rohnert Park, and was made available for review online at gratonteir.com, as required by the Tribal-State Compact (Compact), if applicable. This initiated a 45-day public comment period, during which time written comments regarding the Draft TEIR were accepted through February 1, 2023. An extension of the public comment period was granted through February 8, 2023 upon the request of Sonoma County. Three comment letters were received from the County of Sonoma and Sonoma County Water Agency, the City of Rohnert Park, and the Santa Rosa Plain Groundwater Sustainability Agency. Copies of comment letters are provided in **Appendix I** and responses to each relevant comment received are provided in **Appendix J.** Revisions have been made to this Final TEIR as warranted.

2.3.2 DRAFT TEIR

~~This document serves as t~~The Draft TEIR was prepared for the Proposed Project as required by Section 11.8.1 of the Compact. A description of the Proposed Project and surrounding off-reservation environment, discussions of potential off-reservation impacts, recommended measures to mitigate identified impacts, discussions of unavoidable or irreversible potentially significant off-reservation impacts, and an analysis of an alternative to the Proposed Project are included herein as required by the Compact.

Per Section 11.8.3 of the Compact, the Draft TEIR and Notice of Completion (NOC) ~~will be~~were submitted to the State Clearinghouse, the California Department of Justice, the State Gaming Agency, the City of Rohnert Park, and the County of Sonoma. A Notice of Completion ~~will be~~was made available to the public as required by the Compact. Submission of the Draft TEIR to the State Clearinghouse ~~will~~ marked the beginning of a 45-day public comment period, during which time the Tribe ~~will~~ accepted written comments at the following address:

> **Federated Indians of Graton Rancheria**
> **Attn: TEIR Comments**
> **6400 Redwood Drive, Suite 300**
> **Rohnert Park, CA 94928**

The Draft TEIR ~~will~~ was also ~~be~~ made available online for review at gratonteir.com.

2.3.3 FINAL TEIR

Written comments received by the Tribe at the above address within the 45-day comment period ~~will be~~ have been reviewed and addressed in this~~a~~ Final TEIR per Section 11.8.4 of the Compact. This~~e~~ Final TEIR ~~will~~ includes copies of comments regarding the Draft TEIR received within the 45-day comment period. This~~e~~ Final TEIR ~~will~~ also includes responses to comments and updates, modifications, and~~or~~ revisions to the Draft TEIR as warranted. ~~Upon completion, t~~The Final TEIR ~~will be~~has been considered by the Tribal Council for approval and certification. ~~At least 55 days before the finalization of the negotiations pursuant to Section 11.8.4 of the Compact, the~~. The Final TEIR ~~will be~~has been submitted to the County of Sonoma, City of Rohnert Park, State Clearinghouse, State Gaming Agency, and the California Department of Justice Office of the Attorney General.

2.3.4 INTERGOVERNMENTAL AGREEMENT

Section 11.8.7 of the Compact (to the extent applicable) requires the Tribe to commence negotiations with Sonoma County and the City of Rohnert Park regarding an Intergovernmental Agreement (IGA) no later than the issuance of the Final TEIR. The IGA will address Section 11.8.7 of the Compact regarding the mitigation of potentially significant impacts to the off-reservation environment attributable to the Proposed Project. The IGA ~~must~~ may also address other subjects listed in the Compact that are not addressed in the Final TEIR. If the Tribe, County, and City have not agreed on the terms and conditions of the IGA within 75 days of the County and City receiving the Final TEIR, the Tribe, County, or City may demand that the terms and conditions of the IGA be determined by arbitration pursuant to the process described in Section 11.8.8 of the Compact.

SECTION 3.0

PROJECT DESCRIPTION

3.1 PURPOSE AND NEED

The purpose of the Proposed Project is to provide additional amenities to the existing Resort and to generate additional revenue for the tribal government to sustain the Tribe's self-governance capability. Revenue from the Proposed Project will fund government operations of the Tribe including social services, housing, educational, health, and general welfare programs. Implementation of the Proposed Project will also assist the Tribe in meeting the following objectives:

- Improve tribal socioeconomic status by providing an augmented revenue source to strengthen the tribal government, fund social, governmental, administrative, educational, health, and general welfare services to improve quality of life of tribal members, and provide capital for other economic development and investment opportunities
- Create new jobs for tribal members and non-tribal members
- Provide additional overnight accommodations
- Provide additional space for entertainment events, gatherings, and conventions

3.2 PROJECT COMPONENTS

3.2.1 FEATURES

Key elements of the Proposed Project are shown in **Table 3-1.** A site plan and architectural renderings are provided in **Figures 3** and **4**. Proposed Project components will be constructed within the Tribe's reservation. The casino floor expansion would extend from the eastern extent of the existing game floor and would add up 86,078 square feet (sf). The new hotel wing will consist of six floors with one floor of back and front of house support and five floors of guest rooms. The new hotel wing will be consistent with the height of the existing hotel and will be constructed adjacent to the existing hotel. The new parking structure will be consistent in height with the existing parking structure and will provide five levels of guest parking. Approximately 1,500 parking stalls will be provided along with 30 motorcycle stalls, 50 bus stalls, and 45 bicycle slots. A pedestrian walkway will connect the parking structure to the casino. Approximately 500 existing surface parking spaces would be lost to accommodate the Proposed Project.

The theatre will have approximately 3,500 seats with lobby and support areas. The theatre will be constructed to the north of the existing Resort and will be up to 80 feet in height. On average, it is expected that the theatre will operate two nights per week, but may be used nightly depending on demand. The new heated swimming pool will be located adjacent to the proposed hotel tower. The rooftop restaurant will be constructed atop the casino floor expansion area and will encompass both indoor and outdoor components. In general, the restaurant will be open daily for lunch, dinner, and special events. Labath Avenue will be realigned within the Resort parking lot to remove the existing curved shape, and minor modifications to the existing stormwater basins will be made to accommodate the Proposed Project. Two flow-through water quality basins will be removed as part of the Proposed Project (**Figure 3**).

TABLE 3-1
PROJECT COMPONENTS

Feature	Approximate SF	Approximate # of Units
Casino Floor Expansion	86,078	Up to 3,000 Slot Machines Up to 20 Card Tables
Back of House, Mezzanine, and Support Space	57,613	--
Hotel Tower	290,000	6 Levels 221 Guestrooms
Parking Structure	685,000	5 Levels 1,500 vehicle spaces 30 motorcycle stalls 50 bus stalls 45 bicycle slots
Theater	97,000	3,500 seats
Swimming Pool Area	25,000	--
Rooftop Restaurant	28,000	480 seats
Roadways/Access/Landscaping	611,110	--
Central Plant Modifications	6,250	--
Labath Avenue Realignment	--	--
Stormwater Modifications	--	--
SF = Square Feet		

Construction

The project site currently consists of paved parking, and mass excavation and grading were completed during construction of the original Resort. Therefore, earthwork will be minimal, as described in the grading and drainage report attached as **Appendix D**. Construction will adhere to Section 6.4.2 of the Compact, which contains standards comparable to the California Building and Public Safety Codes. These include, but are not limited to, codes for building, electrical, energy, mechanical, plumbing, fire, and safety (Compact, 2012).

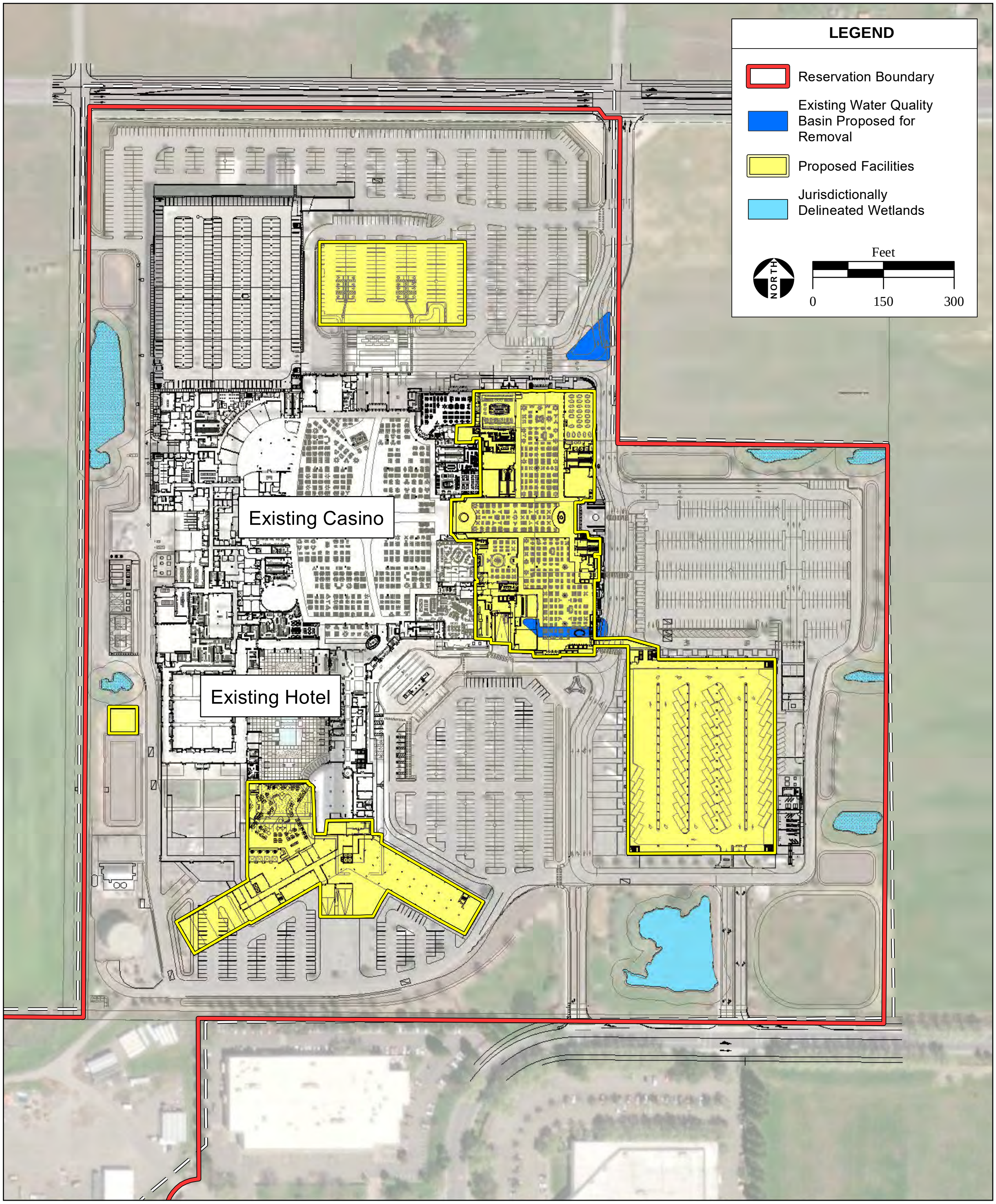
Landscaping

The Proposed Project will be designed using features and colors compatible with the existing Resort. Landscaping will be consistent with the existing landscape design. Consistent with existing facilities, the Proposed Project will use downcast, fully shielded, high efficiency lamps for exterior lighting, will avoid exterior neon and flashing lights, and will glaze exterior glass to minimize glare and nighttime illumination.

3.2.2 UTILITIES

Water Supply

Construction and operation of the Proposed Project will use well water from the existing Resort's water system. The existing water system is located on the reservation and includes two groundwater wells, a water treatment plant, a 900,000-gallon water storage tank used for domestic water supply and fire protection, and a water distribution pump system. No changes to this system are proposed to accommodate the Proposed Project's water needs.



SOURCE: Vivid Maxar aerial photograph, 4/16/2021; BWA, 2022; Montrose Environmental, 10/21/2022

Figure 3
Site Plan

SOURCE: BWA, 10/8/2021; Montrose Environmental, 10/21/2022

Graton Resort & Casino Expansion Project / 203523

Figure 4
Architectural Renditions

The existing wells can accommodate water needs of both the Resort and Proposed Project, as described in the water resources analysis report attached as **Appendix E**. However, to reduce potential impacts to the groundwater basin, recycled water is recommended, and options are further discussed in **Section 4.8**.

Wastewater Treatment

Wastewater generated by the Resort is conveyed to the Rohnert Park sanitary waste system, which conveys the sewage to the Regional Laguna Wastewater Treatment Plant. The Proposed Project would connect to the existing system supporting the Resort. No changes in this system are necessary to accommodate the combined demands of the Resort and Proposed Project, as described in **Appendix E**.

Gas and Electric

The Tribe pays Pacific Gas & Electric for transmission of electricity and supply of natural gas to the Resort. The Resort generates 2.4 megawatts (mw) of electricity through rooftop solar power array. The Tribe also purchases electricity from Sonoma Clean Power. The existing PG&E connections would be utilized for construction and operation of the Proposed Project. The Proposed Project will use energy efficient appliances and lighting and may include an expansion of the solar array to the new rooftop area. The existing power grid and natural gas connection are adequate to serve the Resort and Proposed Project.

3.2.3 BEST MANAGEMENT PRACTICES (BMPS)

BMPs discussed below have been incorporated into project design.

Aesthetics

- Project construction will occur during the hours of 7 am to 10 pm as possible to avoid the need for nighttime construction lighting. In the event that construction activities must occur outside of these hours, lighting will be limited to the minimum amount necessary and will be angled to avoid over spilling the Reservation.
- Features and colors will be compatible with the existing Resort and will consist of earth tone exterior colors and native building materials.
- Landscaping will be consistent with existing landscape design and will complement buildings and parking areas, including setbacks and plantings of trees and shrubs.
- Exterior lighting will be downcast, fully shielded, and high efficiency. Obtrusive light-emitting devices such as neon lights or flashing lights will not be used.
- Exterior glass will be glazed consistent with the existing Resort to minimize glare and nighttime illumination.
- Timers will be used for exterior lighting where possible.
- Uplighting will be minimized and limited to uplighting of structures.

Air Quality/GHGs

- The Proposed Project may include an expansion of the solar array to the new rooftop area.
- ~~The Tribe shall require off-road construction equipment to utilize tier three engines as defined by the USEPA's Vehicle Emission and Fuel Standards Program. In addition, construction equipment shall be operated with a level three diesel particulate filter.~~
- ~~Spray exposed soil with water or other suppressant at least twice a day.~~
- ~~Minimize dust emissions during transport of fill material or soil by wetting down loads, ensuring adequate freeboard (space from the top of the material to the top of the truck bed) on trucks, and/or covering loads.~~

- ~~Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.~~
- ~~Enforce a 15 mile per hour speed limit on unpaved roads.~~
- ~~The Tribe shall reduce emissions of CAPs and GHGs during operation of the Proposed Project through the following actions.~~
- The Tribe shall use clean fuel vehicles in the vehicle fleet where practicable, which would reduce CAPs and GHG emissions.
- The Tribe shall provide preferential parking for employee vanpools, carpools, and or other rideshare vehicles which would reduce CAPs and GHGs.
- ~~The Tribe shall consider and to the extent feasible will incorporate preferential parking for Plug-In Electric Vehicles, along with the installation of corresponding electric vehicle charging stations into the design of the Proposed Project.~~
- ~~Shuttle service to and from population centers shall be provided as feasible, which would reduce CAPs and GHGs.~~
- Water consumption shall be reduced through low-flow appliances, drought resistant landscaping, and the incorporation of “Save Water” signs near water faucets throughout the development.
- To the extent feasible, the Proposed Project shall use low global warming potential (GWP) refrigerants for commercial and industrial use.
- ~~The Tribe shall control CAPs, GHG, and DPM emissions during operation of the Proposed Project by requiring that all diesel-powered vehicles and equipment be properly maintained and minimizing idling time to five minutes at loading docks when loading or unloading food, merchandise, etc. or when diesel-powered vehicles or equipment are not in use; unless per engine manufacturer’s specifications or for safety reasons more time is required.~~
- ~~The Tribe shall use energy efficient lighting, which would reduce indirect CAP and GHG emissions. Using energy efficient lighting would reduce energy usage, thus, reducing indirect GHG emissions.~~
- ~~The Tribe shall use energy-efficient appliances.~~
- ~~The Tribe shall install recycling bins throughout the casino for glass, cans, and paper products. Trash and recycling receptacles shall be placed strategically outside to encourage people to recycle. In addition, to the greatest extent feasible, the Tribe shall promote the use of non-polystyrene take-out containers and encourage food waste composting programs at all restaurants that serve more than 100 meals per day. The Tribe shall reduce the solid waste stream of the facility by at least 50 percent.~~
- ~~The Tribe shall plant trees and vegetation onsite or fund such plantings offsite . The addition of photosynthesizing plants would reduce atmospheric carbon dioxide (CO2), because plants use CO2 for elemental carbon and energy production. Trees planted near buildings would result in additional benefits by providing shade to the building; resulting in reduced heat absorption and air conditioning needs, therefore saving energy.~~
- ~~The Tribe shall encourage turning offdiscourage bus engineses instead offrom idling for extended periods during operation of the Proposed Project.~~
- ~~Adequate ingress and egress at entrances shall be provided to minimize vehicle idling and traffic congestion.~~

Biological Resources

- Adjacent wetlands will be left undisturbed and protected with silt fencing.
- Existing native vegetation will be retained where possible.

Geology and Soils

- Site clearing, preparation, moisture conditioning, review of imported fill, fill placement, observation of foundation excavations, and grading will be verified to ensure compliance with standard engineering practices.
- Stormwater detention will be designed for the maximum credible rainfall event.

Hazardous Materials

Personnel will follow BMPs for filling and servicing construction equipment and vehicles. BMPs that are designed to reduce the potential for incidents/spills involving the hazardous materials include the following:

- Fuel, oil, and hydraulic fluids will be transferred directly from a service truck to equipment.
- Catch-pans will be placed under equipment to catch potential spills during servicing.
- Vehicle engines will be shut down during refueling.
- No smoking, open flames, or welding will be allowed in refueling or service areas.
- Refueling will be conducted away from water bodies to prevent contamination in case of a leak.
- Service trucks will be provided with fire extinguishers and spill containment equipment.
- Should a spill occur, contaminated soil will be disposed of pursuant to applicable regulations.
- Containers storing hazardous materials will be inspected at least once a week for signs of leaks.
- Hazardous materials such as fuels and solvents used in the construction shall be stored in covered containers a minimum of 200 feet from aquatic environments and protected from rainfall, runoff, vandalism, and accidental release to the environment.
- A stockpile of spill cleanup materials shall be readily available at the project site. Construction workers shall be trained in spill prevention and cleanup.
- Equipment used during construction shall be properly inspected and maintained in designated areas with runoff and erosion control measures to minimize accidental release of pollutants.
- Should contaminated soil or groundwater be encountered during earth-moving activities, work will be halted until a hazardous materials specialist or other qualified individual assesses the extent of contamination. If the contamination is hazardous, the U.S. Environmental Protection Agency will be consulted to determine the appropriate course of action, including a sampling and remediation plan if necessary.
- Contractors shall prepare and implement a Hazardous Materials Business Plan in compliance with the California Health and Safety Code if large quantities of hazardous materials are used during construction.

Water Resources

- High water-demand plants will be minimized in landscaping plans.
- Energy Star rated or WaterSense low-flow water fixtures will be installed.
- A Stormwater Pollution Prevention Plan (SWPPP) will be prepared and will include the following BMPs:
    - Impervious surfaces including parking lots and rooftops will be designed and constructed so that runoff will be directed into storm drains that would subsequently direct flow into existing on-reservation engineered bioswales and stormwater basins.
    - Materials containment such as fiber rolls and straw wattles will be installed around down-slope perimeters and at the base of stockpiles.
    - Stockpiles will be covered when not in active use.
    - Straw mulch will be applied via manufacture’s specifications to stabilize disturbed areas.

  - No disturbed surfaces will be left without erosion control measures in place.
  - Temporary erosion control measures including straw wattles/fiber rolls and silt fencing will be provided over base soils until revegetation or landscaping is established.
  - Stormwater runoff during construction will be diverted to on-Reservation stormwater treatment facilities, and observed sedimentation will be removed and properly disposed of on-Reservation.

Noise

- Construction will generally be limited to weekdays, 7 am to 10 pm to the extent feasible.
- Construction vehicles will typically enter and exit the project site from the construction access road separate from the public entrance. The construction access road enters the Reservation from Rohnert Park Expressway.
- Construction vehicles will adhere to the posted speed limit of 15 miles per hour on the construction access road.
- Powered equipment will comply with applicable federal regulations and will be fitted with adequate mufflers according to manufacturing specifications to minimize construction noise.
- Heating, ventilating, and air conditioning equipment will be shielded to reduce noise.
- The theater will incorporate noise-reducing design measures, such as noise dampening insulation and noise cancelling windows. The theatre will be designed such that soundproofing measures will reduce noise production below the Sonoma County General Plan nighttime noise thresholds.
- The hotel and casino expansion will incorporate soundproofing consistent with the existing hotel and casino.

Public Services

- Buildings will be equipped with an early detection system associated with fires.
- Construction equipment that normally includes a spark arrester will be equipped with a spark arrester in good working order.
- During construction, staging areas, welding areas, or areas slated for development using spark-producing equipment would be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, these areas will be kept clear of combustible materials.
- Fire extinguishers will be maintained on-site and inspected on a regular basis.

Transportation

- A Traffic Demand Management Plan will be prepared parallel to requirements set forth by the SCTA. The plan shall include the following:
  - Truck drivers shall be notified of and required to use the most direct routes.
  - Site ingress and egress will occur only at the main driveways to the project site and construction activities may require installation of temporary traffic signals.
  - Designated travel routes for large vehicles will be monitored and controlled by flaggers for large construction vehicle ingress and egress.
  - Warning signs indicating frequent truck entry and exit will be posted on Golf Course Drive.
  - Debris and mud on nearby streets caused by trucks will be monitored daily and may require instituting a street cleaning program.
- A Traffic Control Plan will be implemented for large theater events.

Utilities and Service Systems

- The City's sewer main and utility easement along the edge of the Resort parking lot and the vacated Labath Avenue will be avoided during construction.

3.3 SCHEDULE AND EMPLOYMENT

Construction of the Proposed Project will occur over a period of ~~approximately~~ at least 26~~18~~ months, beginning in mid ~~early~~ 2023. However, construction will be phased, with the parking garage being constructed first, then~~ce~~ the casino/hotel expansion, and then the theater, which may be built at a later date over a period of an additional 18~~5~~ months. The Proposed Project will generate approximately 2,000 temporary jobs during construction and approximately 500 - 600 additional permanent jobs. The Resort will continue to be owned and operated by the Tribe and will be open 24 hours a day, 7 days a week.

3.4 NO PROJECT ALTERNATIVE

Under the No Project Alternative, expansion of the Resort would not occur. The Resort would not be modified, and would continue to operate in its current form and capacity. The Proposed Project would not be developed and the project site would continue to serve as surface parking for the existing Resort. Positive impacts of the Proposed Project include the generation of additional patronage and jobs in the Sonoma County and Rohnert Park areas, thus providing an economic benefit both on and off-reservation. The No Action Alternative would not result in the economic benefits of the Proposed Project and would prevent the existing Resort from properly accommodating patrons to meet current and projected demand. The objectives listed in **Section 3.1** would not be met.

SECTION 4.0

ENVIRONMENTAL ANALYSIS

4.1 INTRODUCTION

Potentially significant off-Reservation environmental impacts have been evaluated in this TEIR as required by the Compact. A good faith effort has been made to identify potentially significant and adverse off-reservation impacts and to feasibly mitigate these impacts, taking into consideration off-reservation jurisdictional constraints (Compact, 2012). Topics were identified for analysis based on the NOP and comments received on the NOP (**Appendix B** and **C**).

4.1.1 ISSUE AREAS

Off-reservation issue areas identified as having the potential to be adversely affected by the Proposed Project, as well as potential areas of controversy, are addressed in greater detail within this TEIR. These areas include:

- Aesthetics
- Air Quality
- Biological Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Water Resources
- Land Use
- Noise
- Population and Housing
- Public Services
- Transportation
- Utilities and Service Systems
- Cumulative Impacts

Issue areas for which it was determined the Proposed Project will not have potentially significant adverse off-reservation environmental impacts were eliminated from detailed discussion. These areas include: cultural resources, agricultural and forest resources, mineral resources, and recreation.

4.1.2 SIGNIFICANCE CRITERIA

The Compact defines potentially significant off-reservation impacts as changes to the off-reservation environmental setting attributable to the Proposed Project. Potentially significant off-reservation impacts are identified for each off-reservation environmental resource along with a description of the methodology used in the analysis. According to the Compact, a "significant effect" occurs if any of the following conditions exist:

- The Proposed Project has the potential to degrade the quality of the off-reservation environment, curtail the range of the environment, or achieve short-term, to the disadvantage of long-term, environmental goals;
- The possible effects on the off-reservation environment of the Proposed Project are individually limited but cumulatively considerable. As used herein, 'cumulatively considerable' is defined as incremental effects of the Proposed Project which become considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of potential future projects; or
- The off-reservation environmental effects of the Proposed Project will cause substantially adverse effects on human beings, either directly or indirectly.

For each off-reservation environmental resource evaluated, significance criteria have been adopted from the Checklist and incorporated into the off-reservation environmental analysis in each subsection.

4.1.3 MITIGATION MEASURES

Mitigation measures are recommended to eliminate or reduce the magnitude of potentially significant off-reservation impacts that may occur during construction and/or operation of the Proposed Project. In cases where no mitigation is available or required, this conclusion is noted. Unless stated otherwise, where multiple mitigation measures are listed, all are necessary to mitigate a potentially significant off-reservation environmental impact.

4.1.4 CUMULATIVE IMPACTS

The cumulative impact analysis in **Section 4.15** is based on implementation of the Proposed Project as well as the potential cumulative developments described in **Section 4.15**, which may or may not occur.

4.2 AESTHETICS

This section addresses the existing aesthetic resources of the project site and surrounding region, evaluates potential off-reservation environmental impacts that may result from implementation of the Proposed Project, and presents mitigation measures, if necessary, to reduce identified off-reservation impacts to aesthetic resources.

4.2.1 REGULATORY SETTING

Federal

National Scenic Byway Program

The National Scenic Byway Program was established by Congress in 1991 as the Intermodal Surface Transportation Efficiency Act. The Program is administered by the Federal Highway Administration and was established to preserve scenic but less-traveled roadways. A national scenic byway is a road recognized by the U.S. Department of Transportation for one or more of six intrinsic qualities. These intrinsic qualities are archeological, cultural, historic, natural, recreational, and scenic. National scenic byways must already be designated as state scenic byways or must possess all six intrinsic qualities to be nominated (FHWA, 2021a). There are no National Scenic Byways in the vicinity of the project site.

State and Local

The project site is located on trust land and is not subject to State or local laws and regulations concerning aesthetic resources. However, such laws and regulations apply to off-reservation land in the vicinity of the project site.

State Scenic Highways

In 1963, the State Legislature established the California Scenic Highway Program through Senate Bill 1467 and 1468, provisions of which were added to the Streets and Highways Code. The goal of the California Scenic Highway Program is to preserve and enhance the natural beauty of California, with scenic highways being designated based upon the amount of natural landscape visible to a passing motorist. Scenic highway designation does not preclude nearby development; however, the program encourages development that does not degrade the scenic value of the highway corridor. There are no State Scenic Highways in the vicinity of the project site.

Sonoma County Zoning Ordinance

Chapter 26 of the Sonoma County Municipal Code contains the Zoning Ordinance for Sonoma County and regulates the location and uses of all structures and land. The Zoning Ordinance establishes various districts within the unincorporated territory of the County and designates lawful permitted land uses. The purpose of the Zoning Ordinance is to promote and protect the public welfare, to provide for the orderly and beneficial land use of the County, to protect economic stability of agricultural, residential, commercial, industrial and other communities within the County, and to protect and conserve the scenic resource characteristics of the County. The Zoning Ordinance establishes districts within the unincorporated territory of the county and designates lawful permitted uses, and uses which may be approved through the use permit process. In addition, the Zoning Ordinance designates the limitation of height and bulk of future building, and maintains that certain open areas be required around future buildings.

Sonoma County General Plan

The Sonoma County 2020 General Plan is the guiding document for development in the unincorporated areas of Sonoma County, which includes a portion of off-reservation properties in the vicinity of the Proposed Project (Sonoma County, 2018). The Land Use Element provides the distribution, location and extent of uses of land for housing, business, industry, open space, agriculture, natural resources, and other uses. For each appropriate land use category, the Sonoma County 2020 General Plan includes standards for population density and building intensity. The Land Use Element and its policies serve as framework for the development and use of land. The Open Space and Resource Conservation Element provides additional guidance on development within the County. Specifically, this element provides policies for protecting nighttime skies through the use of downcast or shielded lights.

Sonoma County Visual Assessment Guidelines

The County's guidelines provide standards by which to analyze potential visual impacts of development within the County, and suggest possible mitigation measures. While visual evaluations involve qualitative decisions, the County has developed standards with the intent of being objective to the extent possible. The County guidelines first require determining public viewpoints. Then, the use of photographs with visual aids to evaluate impacts is recommended. The visual sensitivity of the site is evaluated by considering the location of the Project Site in relation to scenic resources and scenic protection zoning and given a rating between low and maximum. Visual dominance is then determined by comparing the form and appearance of the site to the surrounding environment, and given a rating. The visual sensitivity and visual dominance results are combined to determine whether visual impacts are significant or less than significant.

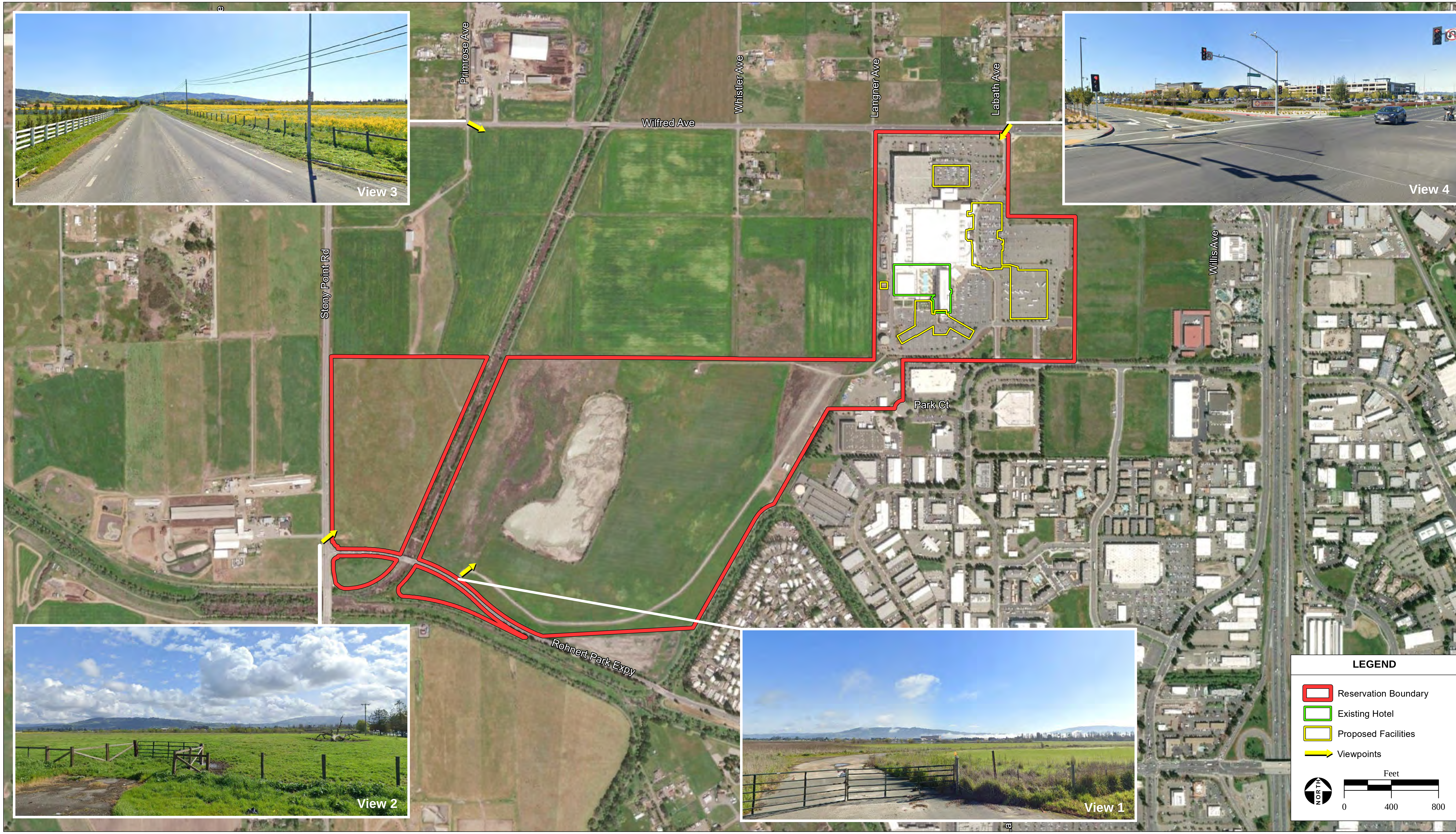
City of Rohnert Park General Plan, NWSP, and WDSP

The Rohnert Park General Plan 2020 is the guiding document for development within the City limits and Sphere of Influence of the City of Rohnert Park, which includes a portion of the off-reservation vicinity of the Proposed Project. The Rohnert Park General Plan is a document required by State law and adopted by the City Council that is a comprehensive, long-term plan for the physical development and growth of the City. The Northwest Specific Plan area is immediately east of the Graton Resort and Casino. The Northwest Specific Plan provides development standards that regulate new development concerning height, building setbacks, parking requirements, and other development features. The Wilfred/Dowdell Village Specific Plan has a 2020 General Plan designation of Regional Commercial.

4.2.2 ENVIRONMENTAL SETTING

A viewshed is comprised of one or more vistas. A vista is defined as a visual corridor that is scenic in nature, pleasing to the public eye, and usually interrupted to some extent by landscaping or buildings. Vistas are identified by considering existing and planned land uses of an area.

A site plan and architectural renderings are provided in **Figures 3** and **4**. Currently, the project site contains the Resort and paved parking. The Resort is a source of nighttime lighting in the area. However, external lighting consists of downcast, fully shielded, high efficiency lamps for all exterior lighting to minimize glare and nighttime illumination. The existing Resort also avoids the use of exterior neon and flashing lights in order to further minimize light pollution.



SOURCE: Vivid Maxar Aerial Photograph, 4/16/2021; Google Streetview, 3/2019, 3/2021; Montrose Environmental, 11/10/2022

Figure 5
Views of the Project Site

VIEW 1: Northeast View from Rohnert Park Expressway

VIEW 2: Northeast view from Stony Point Road and Rohnert Park Expressway

VIEW 3: Southeast view from Wilfred Avenue and Primrose Avenue

VIEW 4: Southwest view from Labath Avenue north of Wilfred Avenue

SOURCE: Google Streetview, 3/2019, 3/2021; Montrose Environmental, 10/21/2022

Figure 6
Viewshed Photographs

Views of the project site are shown in **Figure 5**. Enlarged views of the project site from different viewing locations are shown in **Figure 6.** The dominant vista of the project site is the view of the Sonoma Mountains. The Sonoma Mountains are visible behind the existing Resort, as shown in **Views 1, 2,** and **3** of **Figure 6**. From the project site, the Sonoma Mountains begin approximately three miles to the east and are approximately 25 miles in length.

Historically, the off-reservation area was used for agriculture, cattle grazing, and rural residential purposes. Agricultural land uses are still present to the north, east, and west of the project site, and several parcels also contain rural residential development. Off-reservation land to the south of the project site is developed with commercial and residential land uses. The Rancho Verde Mobile Home Park and several apartment complexes are also located south of the project site intermixed within larger business and commercial developments. Areas to the east and northeast of the project site along Redwood Drive near US-101 are heavily developed with commercial properties, including Costco, Home Depot, Walmart, and the Scandia Family Fun Center.

Off-reservation viewsheds that include the project site are generally limited to passers-by on nearby roadways. Scenic corridors and highways are major routes of travel that offer tourists scenic views. No designated national scenic byways occur in viewing range of the project site (FHWA, 2021b). Caltrans has determined that Gravenstein Highway (CA-116) is eligible as a scenic highway. Gravenstein Highway is approximately 1.7 miles south of the project site and does not offer views of the project site (Caltrans, 2021). However, a portion of US-101 located approximately 0.40 miles from the project site is designated by the County in the General Plan as a scenic corridor (Sonoma County, 2016a).

Major roadways bordering the reservation include Wilfred Avenue/Golf Course Drive to the north, Rohnert Park Expressway to the south, Stony Point Road to the west, and U.S. Highway 101 (US-101) to the east (**Figure 2**). Major roadways used to assess viewshed impacts of the Proposed Project from the perspective of passing motorists are discussed below. Duration of views is dependent on traffic conditions, vehicle speed, obstruction due to buildings or landscape, and direction of travel.

US-101

US-101 is located approximately 0.40 miles east and offers passing motorists very brief and obstructed views of the project site. Residential complexes, large commercial buildings, and thick trees and shrubbery line the roadways along US-101 in between US-101 and the project site. Due to the high speeds of passing motorists and the buildings and trees obstructing views of the project site, the project site is not readily visible to motorists travelling on US-101.

Wilfred Avenue/Golf Course Drive

Wilfred Avenue/Golf Course Drive provides the primary entrance to patrons visiting the Resort. The existing Resort is accessible and visible from Wilfred Avenue/Golf Course Drive looking in a general southerly direction. **View 3** of **Figure 6** shows the existing Resort from the intersection of Wilfred Avenue/Golf Course Drive at Primrose Avenue looking southeast, approximately 0.75 miles from the project site. **View 4** offers a closer view of the existing Resort looking from Wilfred Avenue/Golf Course Drive at Labath Avenue in a southwesterly direction, approximately 500 feet from the project site. However, with the exception of the theatre, the majority of the project site is located towards the east and south of the existing Resort. While aspects of the Proposed Project will be visible from this road, the design will remain consistent with that of existing facilities and will be partly obscured by on-site vegetation.

Rohnert Park Expressway

The project site is visible from a portion of Rohnert Park Expressway looking in a northeasterly direction. **View 1** from Rohnert Park Expressway is approximately 0.8 miles from the project site. Rohnert Park Expressway offers motorists only a very brief view of the project site due to obstruction from development between the project site and Rohnert Park Expressway. Development includes multi-level apartments, business complexes, and the Rancho Verde Mobile Home Park. Because the viewshed of the project site from Rohnert Park Expressway is dominated by buildings unrelated to the Proposed Project, visuals to passing motorists are largely obstructed.

Stony Point Road

Stony Point Road offers passing motorists a partial visual of the project site looking in an easterly direction. **View 2** from Stony Point Road at Rohnert Park Expressway is approximately one mile from the project site. Views from Stony Point Road towards the project site are generally unobstructed as there is no significant development between Stony Point Road and the project site, and topography is relatively flat. Part of the Proposed Project is located to the east, behind the existing on-site structures, and would not be visible from Stony Point Road.

4.2.3 Impact Analysis

Significance Criteria

The following criteria are established by the Off-reservation Environmental Impact Analysis Checklist (**Appendix A**) and have been used in this section to evaluate potential off-reservation environmental impacts of the Proposed Project to off-reservation aesthetics. Such impacts are considered significant if they would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage off-reservation scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway; or
- Create a new source of substantial light or glare, which would adversely affect day or nighttime views of historic buildings or views in the area.

The evaluation of potential impacts of the Proposed Project to off-reservation aesthetics distinguishes between impacts related to construction and operation of the Proposed Project. Construction impacts would be temporary while operational impacts could be permanent. Vantage points from along major roadways are the standard for assessing visual impacts. The evaluation of potential impacts to off-reservation aesthetics consisted of field observation, photographic documentation, review of site plans and renderings, and analysis of regulations that apply to off-reservation aesthetic resources.

Vistas within the viewshed are described by expressing the length and quality of the viewing experience, according to the criteria listed below. <u>These criteria were sourced from the Visual Impact Assessment guidelines provided by the Department of Transportation (U.S. DOT, 2015).</u> While the viewing experience is personal and subjective in nature, the application of the below criteria allows for an objective, baseline assessment of the visual environment and subsequent visual impacts. The visual experience within each vista is comprised of the following constituent elements:

- Clarity in line of sight: The overall visibility of the object within the viewshed, influenced by such factors as trees, buildings, topography, or other potential visual obstruction within the viewshed;
- Duration of Visibility: The amount of time the object is exposed to viewers within the viewshed. For example, a passing commuter will experience a shorter period of viewing time than a resident within the viewshed;
- Proximity of the Viewer: The effects of foreshortening due to the distance of the viewer from the object will influence the dominance of the object in the perspective of the viewer within the viewshed; and
- Number of Viewers: The number of viewers anticipated to experience the visual character of the object in forward-oriented view (i.e., not through a rear-view mirror). A densely populated residential district, or a busy highway within the viewshed of the object would present more viewers than unpopulated areas.

Impact 4.2-1: The Proposed Project could significantly affect off-reservation scenic vistas.

Construction

Construction of the Proposed Project could temporarily alter views of the project site from several off-reservation vantage points. The project site is located to the north, east and south of the existing Resort, and is partially obstructed from view by existing buildings. Machinery and construction activities would be visible to passing motorists on Wilfred Avenue/Golf Course Drive, and briefly visible from Stony Point Road and a portion of Rohnert Park Expressway. The project site is not readily visible from US-101. Wilfred Avenue/Golf Course Drive would be the closest point from which passing motorists could view the project site, approximately 250 feet from the road.

Visibility of construction activities from off-reservation locations would be temporary in nature and would not permanently degrade existing visual characteristics. Construction activities would not damage a scenic vista. Construction activities would be limited to the hours of 7 am and 10 pm as feasible and, should exceptions to this be unavoidable, lighting would be oriented so as not to overspill the reservation. The majority of construction activities would therefore generally occur during daylight hours and would not generate nighttime lighting or excessive glare. No construction would occur off-reservation, and construction would take place on areas previously developed and paved for Resort parking. Construction activities would not physically obstruct off-reservation scenic vistas.

There would be a less-than-significant impact.

Operation

The Sonoma Mountains can be viewed beyond the existing Resort when looking in an easterly direction. This vista will be minimally impacted due to the comparatively large expanse and high elevation of the Sonoma Mountains in conjunction with the project design. The lateral layout design and scale of the Proposed Project is consistent with existing development. Buildings, such as the proposed hotel expansion, would be consistent in height with existing facilities. BMPs outlined in **Section 3.0** would further minimize impacts to scenic vistas by incorporating design elements that complement the surrounding area and existing development.

Furthermore, utilizing Sonoma County's Visual Assessment Guidelines (Sonoma County, 2019a) the Proposed Project would be classified as having a less-than-significant impact. The Proposed Project would likely have "Moderate Sensitivity" as it is within a rural land use designation, and the site does not have any designations that are intended to protect scenic resources. Further, it would likely be considered to be "Co-Dominant" visual dominance as the Proposed Project would be consistent with existing buildings on-site and would utilize landscaping and exterior features consistent with the existing Resort.

There would be a less-than-significant impact.

Impact 4.2-2: The Proposed Project could significantly damage off-reservation scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

Construction

Construction of the Proposed Project could temporarily alter views of the project site from certain off-reservation vantage points. With construction of the Proposed Project contained within trust land, no off-reservation scenic resources would be damaged during construction activities. No off-reservation trees, outcroppings, or historic buildings would be physically altered by construction. Additionally, there are no state scenic highways that offer a view of the project site. Therefore, off-reservation scenic resources visible from scenic highways would not be impacted or interrupted by construction of the Proposed Project.

There would be no impact.

Operation

There are no designated state scenic highways within viewing distance of the project site. Therefore, off-reservation scenic resources visible from scenic highways would not be impacted or interrupted by operation of the Proposed Project.

However, a portion of US-101 located approximately 0.40 miles from the project site is designated by the County in the General Plan as a scenic corridor (Sonoma County, 2016a). Residential complexes, large commercial buildings, and thick trees and shrubbery line the roadways along US-101. Thus, US-101 offers passing motorists very brief and obstructed views of the project site. Due to the high speeds of passing motorists and the buildings and trees obstructing views of the project site, the project site is barely visible to motorists travelling on US-101. Completion of the Proposed Project would not alter off-reservation scenic resources. Building designs and colors of the Proposed Project would remain consistent with those of existing facilities. In addition, the Proposed Project would be consistent in height with existing facilities.

There would be no impact.

Impact 4.2-3: The Proposed Project could create a new source of light or glare that may substantially impact day or nighttime views of historic buildings or views in the area.

Construction

Construction of the Proposed Project would primarily occur during daytime hours. Minor construction lighting could be visible from off-reservation residences during dusk and nighttime hours. BMPs outlined in **Section 3.0** would minimize off-reservation light and glare impacts of the Proposed Project by limiting construction to daylight hours and ensuring construction personnel do not allow construction lighting to overspill the reservation.

There would be a less-than-significant impact.

Operation

The Proposed Project would be developed within an existing parking lot that is currently lit. Lighting of the Proposed Project would remain consistent with lighting of the existing parking lot and Resort. The Proposed Project will use downcast, fully shielded, high efficiency lamps for exterior lighting, will avoid the use of exterior neon and flashing lights, and will glaze exterior glass with a non-reflective tinted coating to minimize glare and nighttime illumination, thus maintaining consistency with the adherence of applicable building and safety code standards.

These design standards, included as BMPs in **Section 3.0,** would minimize off-reservation light and glare impacts of the Proposed Project through the design and installation of appropriate lighting.

There would be a less-than-significant impact.

4.2.4 MITIGATION MEASURES

None.

4.3 AIR QUALITY

This section addresses air quality of the surrounding region, identifies potential impacts of the Proposed Project on the off-reservation environment, and if necessary, presents mitigation measures to reduce potentially significant off-reservation impacts. Air quality is defined as the concentration of regulated pollutants, odor, and exposure to sensitive receptors.

4.3.1 REGULATORY SETTING

Federal

Federal Clean Air Act

The Federal Clean Air Act (CAA) was enacted for the purposes of protecting and enhancing the quality of the nation’s air resources to benefit public health, welfare, and productivity. In 1971, the U.S. Environmental Protection Agency (USEPA) developed primary and secondary National Ambient Air Quality Standards (NAAQS). Six pollutants of concern were designated: carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrous oxides (NO_X), lead (Pb), and suspended particulate matter (PM). PM is designated into two size classes, coarse particulate matter 10 micrometers or less in diameter (PM_{10}) and fine particulate matter 2.5 micrometers or less in diameter ($PM_{2.5}$). The primary NAAQS must “protect the public health with an adequate margin of safety” and the secondary standards must “protect the public welfare from known or anticipated adverse effects (aesthetics, crops, architecture, etc.)”. The primary standards consider long-term exposures for the most sensitive groups in the general population. The USEPA allows states the option to develop stricter standards. California elected this option and adopted standards that are more stringent. **Table 4.3-1** shows applicable USEPA standards.

TABLE 4.3-1
NAAQS PRIMARY STANDARDS AND ASSOCIATED VIOLATION CRITERIA

Pollutant	Symbol	Average Time	NAAQS	Violation Criteria
Ozone	O_3	8 hours	0.07 ppm	If exceeded on more than 3 days in 3 years
Carbon monoxide	CO	1 hour	35 ppm	If exceeded on more than 1 day per year
		8 hours	9.0 ppm	If exceeded on more than 1 day per year
Nitrogen dioxide	NO_2	Annual average	0.053 ppm	If exceeded
		1 hour	0.1 ppm	If exceeded on more than 1 day per year
Sulfur dioxide	SO_2	3 hours	0.5 ppm	If exceeded on more than 1 day in 3 years
		1 hour	.075 ppm	If exceeded on more than 1 day per year
Inhalable particulate matter	PM_{10}	24 hours	150 g/m3	If exceeded on more than 1 day per year
Fine particulate matter	$PM_{2.5}$	Annual arithmetic mean	12 g/m3	If exceeded
		24 hours	35 g/m3	If exceeded on more than 1 day per year
Lead particles	Pb	Calendar quarter	1.5 g/m3	If exceeded
NOTES: ppm = parts per million; g/m3 = micrograms per cubic meter SOURCE: USEPA, 2016				

Attainment Status

To determine compliance with the NAAQS, states are responsible for providing ambient air monitoring data to the USEPA. The USEPA then determines, using the violation criteria, if the results of the monitoring data indicate compliance with the NAAQS. The USEPA classifies areas in compliance with the NAAQS as being in "attainment". Areas that do not meet the NAAQS are classified as being in "nonattainment" by the USEPA. Once an area meets the NAAQS and the local air district has instituted a 10 year maintenance plan to continue meeting those standards, the area can be re-designated to maintenance, and eventually to attainment by the USEPA.

For O_3, if the air quality within a region is determined by the USEPA to be nonattainment, the region is further classified as a marginal, moderate, serious, severe, or extreme nonattainment area. Areas designated as marginal (the least severe nonattainment group) must implement a permit program and conduct an inventory of ozone-producing emissions. The more severe classifications also require implementation of control measures. Control measures must be implemented to reduce emissions of the two pollutants known to be precursors to ozone. These two pollutants are NO_x and reactive organic gasses (ROGs).

Federal General Conformity

The General Conformity Rule of the CAA implements Section 176(c) and establishes minimum thresholds for volatile organic compounds (VOCs), ozone precursors, CO, and other regulated constituents for nonattainment and maintenance areas. Federal General Conformity was promulgated in order to determine conformity of federal actions to state or federal implementation plans. A federal agency must make a determination that a federal action conforms to the applicable implementation plan before the action is taken. A Conformity Determination is required for each pollutant where a total of direct and indirect emissions in a nonattainment or maintenance area caused by the federal action are greater than *de minimis* thresholds. These thresholds provide simple and direct guidance for federal agencies to assure that they comply with approved State Implementation Plans (SIPs). The General Conformity Rule includes a procedure for determining whether the rule is applicable to the actions of a federal agency. There are two phases to general conformity:

1) The Conformity Review process entails a review of each analyzed alternative to assess whether a full conformity determination is necessary; and
2) The Conformity Determination process, which demonstrates how an action would conform with the applicable implementation plan (usually the SIP).

The first step compares emissions estimates for the project to the appropriate general conformity *de minimis* threshold based on a nonattainment type. If the emission estimates from step one are below the thresholds, then a General Conformity Determination is not necessary and step two is not required. The regulations apply to a proposed federal action that would cause emissions of criteria air pollutants (CAPs) above certain levels to occur in locations designated as nonattainment or maintenance areas for the emitted pollutants. If a federal action occurs in a location designated as attainment or unclassified, the General Conformity regulation does not apply to the project. The San Francisco Bay Area Air Basin (SFBAAB) is listed as marginal nonattainment for O_3 and the associated *de minimis* threshold for ozone precursors (VOC and NO_X) is 100 tons per year.

Federal Hazardous Air Pollutant Program

Title III of the CAA requires the USEPA to promulgate National Emissions Standards for Hazardous Air Pollutants (NESHAP). The NESHAP may differ between major sources and area sources of hazardous air pollutants (HAPs). Major sources are defined as stationary sources with potential to emit more than 10 tons per year (tpy) of any HAP or more than 25 tpy of any combination of HAPs; all other sources are considered area sources. The emissions standards were to be promulgated in two phases. In the first phase (1992–2000), USEPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. For area sources, the standards were different, and were based on generally available control technology. In the second phase (2001–2008), USEPA is required to promulgate health risk–based emissions standards when necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAA requires the USEPA to promulgate vehicle or fuel standards to include reasonable controls for toxic emissions, addressing at a minimum benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions.

Federal Clean Air Act and Indian Tribes

The CAA authorizes USEPA to issue regulations specifying the provisions of the CAA for which Indian tribes may be treated in the same manner as states. For those provisions specified, a tribe may develop and implement one or more of its own air quality programs under the Act. The USEPA issued its final rule on this issue in 1998. The rule provides that tribes will be treated in the same manner as states for virtually all CAA programs. The rule grants tribes with USEPA-approved CAA programs authority over all air resources within the exterior boundaries of a reservation (including non-Indian owned fee lands). No such program exists for the Federated Indians of Graton Rancheria, and thus the USEPA retains permitting authority for sources of air pollution located on the project site.

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 promised to prevent significant deterioration of air quality under the Prevention of Significant Deterioration (PSD) program. 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.” There are 156 mandatory Class I areas nationwide. Any major source of emissions within 100 kilometers (km) (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). The PSD Program protects Class I areas by allowing only a small increment of air quality deterioration in these areas by providing for assessment of potential impacts on air quality related values of Class I areas. A “major source” for the PSD program is defined as a facility that will emit (from direct stationary sources) 250 tons per year of regulated pollutant. “Mobile sources (i.e., vehicle emissions) are by definition not stationary sources and are therefore not considered under the PSD program”. For certain industries, the requirements apply to facilities that emit (through direct stationary sources) 100 tons per year or more of a regulated pollutant. The Proposed Project is within 100 km of the Point Reyes National Seashore. As presented in **Section 4.3.3**, the Proposed Project would not be considered a major source, and no further analysis is required.

Tribal New Source Review

A tribal new source review (NSR) permit is required prior to construction in both attainment and nonattainment areas if the projected aggregate operational emissions from stationary sources at the proposed facility exceed the minor NSR thresholds listed in **Table 4.3-2.** 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. If applicable, the Tribe would apply for and obtain a site-specific or, if promulgated prior to the start of construction, a general minor NSR permit in accordance with USEPA guidelines and Tribal NSR regulations. The San Francisco Bay Area Air Basin (SFBAAB), within which the project site is located, is listed as marginal nonattainment for O_3; therefore, the associated emissions thresholds for nonattainment areas will be used for O_3, and thresholds for attainment areas will be used for all other pollutants.

TABLE 4.3-2
TRIBAL MINOR NEW SOURCE REVIEW THRESHOLDS

Pollutant	Emissions Thresholds for Nonattainment Areas (TPY)	Emissions Thresholds for Attainments Areas (TPY)
NO_x	5.0	10
ROGs	2.0	5.0
PM	5.0	10
PM_{10}	1.0	5.0
$PM_{2.5}$	0.6	3.0
CO	5.0	10
SO_2	5.0	10
Pb	0.1	0.1
SOURCE: 40 CFR 49.153		

State and Local

California Clean Air Act

In 1988, the State legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. CCAA requirements include annual emission reductions, development and use of low emission vehicles, establishment of the California Ambient Air Quality Standards (CAAQS), and submittal of air quality attainment plans by air districts for incorporation into the California SIP. The California Air Resource Board (CARB) is the state agency responsible for coordinating both state and federal air pollution control programs in California. CARB designated CAAQS for the six federal CAPs and four additional pollutants: vinyl chloride, visibly reducing particles, sulfates, and hydrogen sulfide. CARB designated 15 individual air basins within the State by grouping similar geographic or political (such as a county) areas together that exhibit similar air quality conditions. The project site is located within the SFBAAB (refer to **Section 3.3.2**). Air districts were established for each air basin or similar groups of air basins within California to implement the enforcement provisions of the CCAA and the CAA and to develop individual air quality attainment plans for incorporation into the SIP. The air districts are designated as air quality management districts (AQMDs) or air pollution control districts (APCDs). Both AQMDs and APCDs were given the authority under the CCAA to regulate stationary, indirect, and area sources of air pollution. The off-reservation environment surrounding the project site is governed by the Bay Area Air Quality Management District (BAAQMD).

California SIP

California's SIP is comprised of the State's overall air quality attainment plans to meet the NAAQS as well as the individual air quality attainment plans of each AQMD and APCD. The California SIP is a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), AQMD and APCD rules, state regulations, and federal controls for each air basin and California's overall air quality. Many of the items within the California SIP rely on the same control strategies, such as emissions standards for cars and heavy trucks, fuel regulations, and limitations on emissions from consumer products. AQMDs and APCDs, as well other agencies such as the Bureau of Automotive Repair, prepare draft California SIP elements and submit them to CARB for review and approval. The CCAA identifies CARB as the lead agency for compiling items for incorporation into the California SIP, and submitting the items to the USEPA for approval.

Assembly Bill 1493 (AB 1493)

Assembly Bill 1493 (2002) requires CARB to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as Pavley I. Subsequent improvements to these standards covered model years 2012 to 2016 and resulted in 30 percent GHG reductions by 2016. The most recent standards establish a range of annual GHG reductions for 2017 to 2025 model year light-duty vehicles of 3 to 6 percent per year.

Executive Order S-3-05 (EO S-3-05)

Executive Order 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; and
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

Executive Order S-3-05 created a "Climate Action Team" (CAT) headed by the California Environmental Protection Agency and including several other state agencies. The CAT is mandated by EO S-3-05 to outline the effects of climate change on California and recommend an adaptation plan. The CAT is also mandated with creating a strategy to meet the emission reduction target required by the EO. In April 2006 the CAT published an initial report that accomplished these two tasks. Subsequent CAT reports discussed the progress and supplemental recommendations to ensure the targets of EO S-3-05. The 2010 CAT Report to the Governor and Legislature was issued December 2010 (CalEPA, 2010).

California Global Warming Solutions Act of 2006 (Assembly Bill 32 [AB 32])

Asembly Bill 32 codifies a key requirement of EO S-3-05, specifically the requirement to reduce statewide GHG emissions to 1990 levels by 2020, and mandates that CARB monitor state sources of GHGs and design 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. Assembly Bill 32 required that CARB prepare a comprehensive "scoping plan" every five years that identifies all strategies necessary to fully achieve the required 2020 emissions reductions. In early December 2008, CARB released its scoping plan to the public, which was approved by CARB on December 12, 2008. The scoping plan relies on existing technologies and improving energy efficiency to achieve the 30 percent reduction in GHG emission levels by 2020.

A second update to the Climate Change Scoping Plan was adopted on December 14, 2017. The 2017 Scoping Plan Update addresses the 2030 target established by SB 32, as discussed below, and establishes a proposed framework of action for California to meet a 40 percent reduction in GHG by 2030 compared to 1990 levels. Key programs that the 2017 Scoping Plan Update builds on include the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, an increase in the use of renewable energy in the State, and a reduction of methane emissions from agricultural and other wastes (CARB, 2017).

The California Climate Crisis Act (AB 1279)

Assembly Bill 1279 declares the State's policy to achieve net zero greenhouse gas emissions no later than 2045 and achieve and maintain net negative greenhouse gas emissions thereafter. The bill also ensures that by 2045, statewide anthropogenic greenhouse gas emissions will be reduced to at least 85% below the 1990 levels. The bill requires the State Board to work with relevant State agencies to ensure that updates to the CARB 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, as specified.

The 2022 CARB Scoping Plan (Plan) lays out the sector-by-sector roadmap for California to achieve carbon neutrality by 2045 or earlier, outlining a technologically feasible, cost-effective, and equity-focused path to achieve the State's climate target. Previous plans have focused on GHG reduction targets for our industrial, energy, and transportation sectors—first to meet 1990 levels by 2020, then to meet the more aggressive target of 40% below 1990 levels by 2030. The 2022 Scoping Plan extends and expands on the earlier plans with a target of reducing anthropogenic emissions to 85% below 1990 levels by 2045. The Plan outlines how carbon neutrality can be achieved by taking bold steps to reduce GHGs to meet the anthropogenic emissions target and by expanding actions to capture and store carbon through the State's natural and working lands and using a variety of mechanical approaches (CARB, 2022). The major element of the 2022 Scoping Plan focuses on the aggressive reduction of fossil fuels wherever they are currently used in California. The main tenets of the Scoping Plan include the electrification of vehicles, homes, and buildings; stricter regulation of chemicals and refrigerants that potentiate climate change; encouraging sustainable forms of public transportation; increased production of renewable energies and fuels; and promotion and expansion of healthy natural working lands (forests, shrublands/chaparral, croplands, wetlands, and other lands) (CARB, 2022).

Executive Orders S-01-07 and B-30-15

Executive Order S-01-07 mandates a statewide 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 sets interim GHG targets of 40 percent below 1990 by 2030, to ensure California will meet its 2050 targets set by AB 32. It also directs the CARB to update the Climate Change Scoping Plan.

Senate Bills 350 and 32

Senate Bill 350 (2015) codifies the GHG targets for 2030 set by EO B-30-15. To meet these goals, SB 350 also raises the renewable portfolio standard from 33 percent renewable generation by 2020 to 50 percent renewable generation by December 31, 2030. Passed by the California State Legislature in 2016, SB 32 codifies a GHG emissions reduction target of 40 percent below 1990 levels by 2030 and provides additional direction for developing Scoping Plan updates as described by the companion legislation, AB 197.

Bay Area Air Quality Management District

The BAAQMD is the responsible air district for regulating off-reservation air quality in the portion of the SFBAAB surrounding the project site. The BAAQMD has jurisdiction over all or portions of the nine counties in the Bay Area including the southern portion of Sonoma County. The following BAAQMD rules and regulations apply to the off-reservation environment in the vicinity of the project site:

> **Regulation 1-300–Public Nuisance:** No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. For purposes of this section, three or more violation notices validly issued in a 30-day period to a facility for public nuisance shall give rise to a rebuttable presumption that the violations resulted from negligent conduct.

> **Regulation 7–Odorous Substances:** This Regulation places general limitations on odorous substances and specific emission limitations on certain odorous compounds. A person must meet all limitations of this Regulation, but meeting such limitations shall not exempt such person from any other requirements of the District or state or federal law.

The BAAQMD periodically prepares and updates plans to achieve the goal of clean air. Bay Area plans are prepared with the cooperation of the Metropolitan Transportation Commission and the Association of Bay Area Governments. The BAAQMD has an Air Toxics Program that consists of several elements that are designed to identify and reduce public exposure to toxic air contaminants (TACs). The three primary control programs are 1) a preconstruction review of new and modified sources, 2) the Air Toxics “Hot Spots” program, and 3) air pollution control measures designed to reduce emissions from categories of sources of TACs, statewide Airborne Toxic Control Measures, and NESHAPs.

Bay Area Air Quality Management District 2017 Clean Air Plan

The BAAQMD 2017 Clean Air Plan focuses on two closely related goals, protecting public health and protecting the climate. Consistent with the GHG reduction targets adopted by the state of California, the plan lays the groundwork for a long-term effort to reduce Bay Area GHG emissions by 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050.

The Plan offers a long-range vision of how the Bay Area could look and function in the year 2050 post-carbon economy and describes a comprehensive control strategy that the Air District will implement over the next three to five years to protect public health and protect the climate while setting the region on a pathway to achieve the 2050 vision.

The 2017 Plan updates the most recent Bay Area ozone plan, the 2010 Clean Air Plan, pursuant to air quality planning requirements defined in the California Health & Safety Code. To fulfill State ozone planning requirements, the 2017 control strategy includes all feasible measures to reduce emissions of ozone precursors—ROG and NOx—and reduce the transport of ozone and its precursors to neighboring air basins. In addition, the Plan builds upon and enhances the Air District’s efforts to reduce emissions of fine particulate matter and toxic air contaminants.

Sonoma County General Plan

The Open Space and Resource Conservation Element in the Sonoma County General Plan addresses regional air quality. The Element presents policies in accordance with requirements of the Federal and State Clean Air Acts that encourage preservation of air quality to protect human health and preclude crop, plant, and property damage. Projects are generally referred to local air quality districts for review.

Sonoma County Climate Action Plan

The County adopted the Regional Climate Protection Authority's (RCPA) Climate Action Plan (CAP) in 2016 as an implementation measure of the Sonoma County 2020 General Plan. Although the CAP was not upheld in court following litigation, and the certification of the CAP's EIR was rescinded on November 13, 2017, the RCPA backs the research and GHG reduction strategies developed in the CAP for planning purposes.

Sonoma County Five-Year Strategic Plan 2021-2026: Climate Action and Resiliency

Sonoma County's Five-Year Strategic Plan provides context to inform policies and projects that are prioritized over the span of 2021 to 2026. Specifically, the Plan's Climate Action and Resiliency portion focuses on countywide mobilization efforts toward mitigating and preventing climate change through strategies involving preparedness, adaptation, and resiliency. Air Quality and GHG Goals adopted by the Strategic Plan include the following:

Goal 1: Continue to invest in wildfire preparedness and resiliency strategies
Goal 2: Invest in the community to enhance resiliency and become carbon neutral by 2030
Goal 3: Make all County facilities carbon-free, zero waste, and resilient
Goal 4: Maximize sustainability and emissions reductions in all County Fleet vehicles
Goal 5: Maximize opportunities for mitigation of climate change and adaptation through land conservation work and land use policies

City of Rohnert Park General Plan, NWSP, and WDSP

Chapter 6.4 of the City's General Plan outlines air pollutants of concern and sensitive receptors. Policies and goals are presented to meet federal and state standards as well as improve overall air quality by reducing the generation of air pollutants from stationary and mobile sources. Policies are in cooperation with BAAQMD to achieve emissions reductions for nonattainment pollutants.The Rohnert Park General Plan states that a specific plan process is necessary for the northwest area to plan for land uses. The Northwest Specific Plan area is immediately east of the Graton Resort & Casino.

The Northwest Specific Plan provides development standards that regulate new development concerning height, building setbacks, parking requirements, and other development features. The Wilfred/Dowdell Village Specific Plan applies to approximately 20.19 acres generally south of Wilfred Avenue. The Specific Plan was approved by the City in 2008. The Wilfred/Dowdell Village Specific Plan has a 2020 General Plan designation of Regional Commercial.

4.3.2 ENVIRONMENTAL SETTING

The project site is located on the Santa Rosa Plain, within the larger SFBAAB. To the east, the Santa Rosa Plain is bordered by the Sonoma and Mayacama Mountains, with the San Pablo Bay at the southeast end. To the west is flat agricultural land and then a series of low hills.

Further west are the Estero Lowlands, which open to the Pacific Ocean. The region from the Estero Lowlands to the San Pablo Bay is known as the Petaluma Gap. This low-terrain area is a major transport corridor allowing marine air to pass into the SFBAAB.

A semi-permanent high-pressure area centered over the northeastern Pacific Ocean dominates the summer climate of the West Coast. This high-pressure cell is quite persistent, and storms rarely affect the California coast during the summer. Thus, the conditions that persist along the coast of California during summer are a northwest airflow and negligible precipitation. A thermal low-pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the SFBAAB during the summer. In winter, the Pacific high-pressure area weakens and shifts southward, upwelling ceases, and winter storms become frequent. Almost all of the Bay Area's annual precipitation occurs in the November through April period. During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate, and air pollution potential is very low. During some periods in winter, when the Pacific high becomes dominant, inversions become strong and often are surface-based; winds are light and pollution potential is high.

Criteria Air Pollutants

Criteria Air Pollutants are classified in each air basin, county, or, in some cases, within a specific area. The classification is determined by comparing actual monitoring data with federal and California standards. If a criteria air pollutant's concentration is lower than the standard or not monitored in an area, the area is classified as attainment, or unclassified. If an area exceeds the standard, the area is classified as nonattainment for that pollutant. If an area was previously nonattainment, but is now meeting the standard, it is classified as maintenance and treated as a transitional zone. The maintenance designation is only applicable to the Federal standards, and does not have a California equivalent. The SFBAAB is designated as nonattainment for O_3 and $PM_{2.5}$ under the NAAQS and CAAQS, as well as, nonattainment for PM_{10} under the CAAQS, and therefore these are the pollutants of concern, shown in **Table 4.3-3**.

TABLE 4.3-3
SFBAAB ATTAINMENT STATUS

Pollutant	NAAQS	CAAQS
O_3, 8-hour	Nonattainment (Marginal)	Nonattainment
PM_{10}	Unclassified	Nonattainment
$PM_{2.5}$	Nonattainment (Moderate)	Nonattainment
CO	Attainment	Attainment
N_2O	Unclassified/Attainment	Attainment
SO_2	Attainment	Attainment
Pb	Attainment	Attainment
SOURCE: BAAQMD, 2022		

Ozone

O_3 is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include ROGs and NO_X, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem and often the effects of the emitted ROG and NO_X is felt a distance downwind of the emission sources.

Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone can irritate lung airways and cause inflammation much like a sunburn. Chronic ozone exposure can induce morphological changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung.

Particulate Matter

Particle pollution is a mixture of microscopic solids and liquid droplets suspended in air. This pollution, also known as particulate matter, 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 that are 2.5 micrometers in diameter ($PM_{2.5}$) pose the greatest problems, because they can get deep into lungs and the bloodstream. Exposure to such particles can affect both lungs and heart. Larger particles are of less concern, although they can irritate eyes, nose, and throat. Both long and short-term particle exposures have been linked to health problems.

Emission Sources

California is a diverse state with many sources of air pollution. To estimate the sources and quantities of pollution, CARB, in cooperation with local air districts and industry, maintains an inventory of California emission sources. Sources are subdivided into four major emission categories: stationary sources, area-wide sources, mobile sources, and natural sources. Stationary source emissions are based on estimates made by facility operators and local air districts. Emissions from specific facilities can be identified by name and location. The CARB and the local air district estimate area-wide emissions. Emissions from area-wide sources may be from small individual sources, such as residential fireplaces, or from widely distributed sources that cannot be tied to a single location, such as consumer products and dust from unpaved roads. The CARB estimates mobile source emissions with assistance from districts and other government agencies. Mobile sources include planes, trains, and automobiles.

Odors

Existing odor sources in the area of the project site are primarily limited to those associated with various agricultural activities, including fertilization and cattle grazing activities. During site visits, no significant odors were detected on the project site.

Toxic Air Contaminants (TAC)

A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. Toxic Air Contaminants are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. The majority of estimated health risks from TACs can be attributed to relatively few compounds, including diesel particulate matter (DPM), benzene, formaldehyde, 1,3-butadiene, and acetaldehyde (CARB, 2014). The most significant of these being particulate matter from diesel-fueled engines.

Diesel particulate matter differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. The CARB's DPM reduction efforts and reductions in public exposure to DPM are of increased importance. The CARB's Risk Reduction Plan to Reduce Particulate Matter Emission from Diesel-Fueled Engines and Vehicles (CARB, 2014) ("Diesel Reduction Plan") calls for all new diesel-fueled vehicles and engines to use catalyzed diesel particulate filters and low-sulfur diesel fuel. The projected emission benefits associated with the full implementation of CARB's plan, including proposed federal measures, are reductions in DPM emissions of 85 percent by 2020.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for sensitivity include pre-existing health problems, proximity to emissions and odor sources, or duration of exposure to air pollutants or odors. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality related health problems. Residential areas are considered sensitive to poor air quality, because people usually stay home for extended periods of time, with greater associated exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

The nearest residences to the project site are located on Wilfred Avenue, approximately 0.15 miles northeast of the project site where groundbreaking would occur. Another residence occurs approximately 0.25 miles to the northwest of the westmost component of the Proposed Project. Additionally, Fiori Estates and the Reserve at Dowdell (apartment complexes) are approximately 0.25 miles from the project site and from construction access. The closest school, Pathways Charter School, is located approximately 0.65 miles east of the project site on Professional Center Drive. The closest assisted living facility is Brookdale, which is located approximately two miles east of the project site on Snyder Lane. The nearest medical facility is Concentra Urgent Care, located 1.15 miles southeast of the project site on State Farm Drive.

4.3.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by Off-reservation Environmental Impact Analysis Checklist (**Appendix A**) and have been used in this section to evaluate the potential off-reservation impacts of the Proposed Project on air quality. Such impacts are considered significant if they would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors);
- Expose off-reservation sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people off-reservation.

The SFBAAB surrounding the project site is classified as nonattainment for ozone and $PM_{2.5}$ under both the Federal and State standards, and nonattainment for the State PM_{10} standard.

A significant impact would occur if the Proposed Project would result in emissions of PM_{10}, $PM_{2.5}$ or ozone precursors (ROGs and NO_X) at levels that would conflict with or obstruct an applicable air quality plan, violate an air quality standard, or contribute to an existing or projected air quality violation.

Accordingly, the *de minimis* levels set forth in the Federal General Conformity rule are used to evaluate the significance of the Proposed Project's off-reservation air quality impacts. *De minimis* levels for ozone precursors ROG and NO_X are 100 tons per year each because BAAQMD is designated as marginal nonattainment for ozone under the NAAQS. Additionally, *de minimis* levels for $PM_{2.5}$ are 100 tons per year because BAAQMD is designated as moderate nonattainment for $PM_{2.5}$ under the NAAQS. The BAAQMD is designated as attainment by the USEPA for PM_{10}, therefore there are no applicable *de minimis* standards, however these emissions are disclosed for informational purposes, because the off-reservation environment is designated as nonattainment at the State level.

Construction

Emissions from equipment, mobile sources, and architectural coating applications were calculated using the California Emissions Estimator Model (CalEEMod) (refer to CalEEMod output in **Appendix F**). The CalEEMod is the air quality modeling tool preferred by AQMDs and APCDs statewide. The CalEEMod utilizes land use and transportation data from projects to estimate project emissions using local emission factors from sources such as energy and transportation. The CalEEMod accounts for increases in fuel efficiency, renewable energy procurement, and energy efficiency mandated by state laws. Published emissions factors from CARB were applied to project-specific estimates of equipment use, number of construction employee and vendor vehicle trips, and application rates of architectural coatings based on square footages of the components of the Proposed Project.

Operation

Operational emissions were calculated at the buildout year of 2024 by quantifying operation-related fuel combustion from building energy and stationary engines and mobile sources. Mobile-source emissions estimates are based on miles traveled by the new vehicle trips associated with the Proposed Project and trip characteristics of the patrons and employees. The number of trips traveled by patrons was calculated with data described in **Appendix G** and **Section 4.13**.

The *Transportation Project-Level CO Protocol* (CO Protocol; UC Davis, 1997) deals with project-level air quality analysis needed for federal conformity determinations, NEPA, and CEQA. In 1997, the USEPA approved the CO Protocol for use as an alternative "hot spot" analysis method in California. The CO Protocol provides a screening procedure for determining when a project may be of concern for CO violations and identifies a standardized method of using the CALINE4 dispersion model for detailed analysis if necessary. The CO Protocol is the standard method for project-level CO analysis by Caltrans, replacing the *Air Quality Technical Analysis Notes* (Caltrans, 2014). Carbon monoxide (CO) concentrates on the ground and does not disperse well, causing localized impacts at major congested intersections. Hotspot analysis is deemed necessary if the Proposed Project involves or worsens a signalized intersection to LOS E or F.

Diesel Particulate Matter

Diesel Particulate Matter emissions from construction and operational emissions were quantified using the same procedures as CAP emissions estimates and include emissions from vendor trips during construction, which were conservatively assumed to be made entirely by heavy duty vehicles.

For this analysis it is conservatively assumed that 100 percent of the exhaust PM would be DPM, although actual exhaust would not consist entirely of DPM. Construction worker commute trips were not included in the analysis due to their vehicle classes, which constitute a negligible fraction of diesel vehicles. Patron trips by private vehicle and employee commute trips to the Resort and the project site were not considered in the analysis because these trips would be made by vehicle classes that emit negligible amounts of DPM.

Impact 4.3-1: The Proposed Project could conflict with or obstruct implementation of applicable air quality plans.

Construction

The Proposed Project is located on trust land and governed by the California SIP, which is certified by the USEPA. The efficacy of the SIP as a whole is determined by the air basin reaching attainment levels of all CAPs. A project's compliance with the SIP to meet Federal standards is determined by emissions related to the Proposed Project in relation to the applicable *de minimis* standards.

Construction of the Proposed Project would generate ROG, NO_X, PM_{10}, and $PM_{2.5}$ from the operation of heavy equipment and construction machinery, construction worker and vendor trips (mobile sources), and application of architectural coatings. Construction activities are temporary in nature and would occur intermittently. Construction would be phased, beginning with the parking garage. The casino and hotel expansion would be constructed in the next phase, followed by the theater. **Table 4.3-4** through **4.3-6** present the average daily unmitigated construction emissions associated with each phase of the Proposed Project. Quantified construction emissions are presented in **Appendix F**.

TABLE 4.3-4
PARKING GARAGE UNMITIGATED AVERAGE DAILY CONSTRUCTION EMISSIONS

Construction Year	Pollutants of Concern (lb/day)			
	ROG	NOx	PM_{10}	$PM_{2.5}$
2023	3.63	28.30	21.07	11.31
2024	25.38	8.32	0.56	0.41
Maximum Average Daily Emissions	25.38	28.30	21.07	11.31
Average Daily Emissions Threshold	54	54	82	54
Threshold Exceeded	No	No	No	No

NOTES: lb/day = pounds per day;
Emissions reflect maximum average winter and summer emissions.
SOURCE: **Appendix F**

Unmitigated Proposed Project emissions would exceed daily allowable limits for ROG during construction of the hotel and casino expansion and theater (**Tables 4.3-4** through **4.3-6**). However, implementation of best management practices in **Section 3.0** and Mitigation Measure 4.3-1 would reduce ROG emissions to under allowable emission threshold levels. Therefore, construction emissions related to ROG, NO_X, PM_{10}, and $PM_{2.5}$ would be less than allowable emission thresholds and construction of the Proposed Project would not conflict with or obstruct the implementation of the applicable air quality plan.

TABLE 4.3-5
HOTEL AND CASINO EXPANSION UNMITIGATED AVERAGE DAILY CONSTRUCTION EMISSIONS

Construction Year	Pollutants of Concern (lb/day)			
	ROG	NOx	PM_{10}	$PM_{2.5}$
2024	210.96	27.22	21.03	11.27
2025	210.94	1.22	0.33	0.13
Maximum Average Daily Emissions	210.96	27.22	21.03	11.27
Average Daily Emissions Threshold	54	54	82	54
Threshold Exceeded	Yes	No	No	No

NOTES: lb/day = pounds per day;
Emissions reflect maximum average winter and summer emissions.
SOURCE: **Appendix F**

TABLE 4.3-6
THEATER UNMITIGATED AVERAGE DAILY CONSTRUCTION EMISSIONS

Construction Year	Pollutants of Concern (lb/day)			
	ROG	NOx	PM_{10}	$PM_{2.5}$
2025	82.32	17.89	8.35	4.12
Maximum Average Daily Emissions	82.32	17.89	8.35	4.12
Average Daily Emissions Threshold	54	54	82	54
Threshold Exceeded	Yes	No	No	No

NOTES: lb/day = pounds per day;
Emissions reflect maximum average winter and summer emissions.
SOURCE: **Appendix F**

There would be a less-than-significant impact with mitigation.

Operation

Operational emissions would be primarily indirect (i.e., not associated with a point source on the project site) and would be generated by new patron and employee vehicle trips to the project site. Combustion of natural gas on the project site would also contribute to total emissions associated with the operation of the Proposed Project. Operational emissions were estimated for the buildout year of 2026. **Table 4.3-7** presents the unmitigated operational emissions associated with the Proposed Project as quantified in **Appendix F**.

TABLE 4.3-7
UNMITIGATED OPERATIONAL EMISSIONS

Category	Pollutants of Concern (tons per year)			
	ROG	NOx	PM_{10}	$PM_{2.5}$
Area	2.19	0.00	0.00	0.00
Energy	0.11	1.01	0.08	0.08
Mobile	4.31	4.89	6.48	1.78
Total	**6.61**	**5.90**	**6.56**	**1.86**
Annual Emission Thresholds	**10**	**10**	**15**	**10**
Threshold Exceeded	No	No	No	No

SOURCE: **Appendix F**

Unmitigated Proposed Project emissions would be less than the allowable BAAQMD operational air quality thresholds. Because operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ would be below the annual emission thresholds, operation of the Proposed Project would not conflict with or obstruct implementation of the applicable air quality plan, violate an air quality standard, or contribute to the existing or projected air quality violation related to the emissions of ozone precursors.

There would be a less-than-significant impact.

Impact 4.3-2: The Proposed Project could violate an air quality standard or contribute to an existing or projected air quality violation.

As discussed in **Impact 4.3-1,** with the implementation of Mitigation Measure 4.3-1 and best management practices described in **Section 3.0**, the Proposed Project would not emit ROG, NO_X, PM_{10}, or $PM_{2.5}$ above construction and emission thresholds. Therefore, the Proposed Project would not violate an air quality standard or contribute to an existing or projected violation.

There would be a less-than-significant impact with mitigation.

Impact 4.3-3: The Proposed Project could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).

As discussed in **Impact 4.3-1,** with the implementation of best management practices described in **Section 3.0,** the Proposed Project would not emit ROG, NO_X, PM_{10} or $PM_{2.5}$ above construction and emission thresholds. Therefore, the Proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard.

There would be a less-than-significant impact.

Impact 4.3-4: The Proposed Project could expose off-reservation sensitive receptors to substantial pollutant concentrations.

CO concentrates on the ground and does not disperse well, causing localized impacts at major congested intersections. Therefore, elevated concentrations of CO, which can have adverse effects on sensitive receptors, tend to occur at intersections that experience high traffic volumes, resulting in long delays and vehicle idling times if the LOS is exceeded for the intersection.

As described previously under the significance threshold for CAPs, emissions of CO generated by the Proposed Project would have the potential to cause a violation of short-term standards if implementation of the Proposed Project would result in a decrease in LOS (**Appendix G**). The concern relating to CO is normally limited to major signalized intersections operating at LOS E or F. According to the Traffic Impact Study prepared for the Proposed Project (**Appendix G**), no major signalized intersections or roadways within the off-reservation study roadway network would operate at LOS E or F as a result of the Proposed Project.

Therefore, the screening procedures described in the CO Protocol (UC Davis, 1997) do not indicate that microscale CO modeling is necessary (Caltrans, 2014). Implementation of the Proposed Project would not expose off-reservation sensitive receptors to substantial CO concentrations.

There would be a less-than-significant impact.

Impact 4.3-5: The Proposed Project could create objectionable odors affecting a substantial number of people off-reservation

Construction

Construction of the Proposed Project would result in emissions of DPM from heavy equipment use, which could result in odors. However, due to the minimal extent of ground-breaking activities (refer to **Section 2.0**), and the distance from the project site to the nearest sensitive receptor (0.14 miles from construction activities to the nearest residents), exposure of substantial levels of DPM to off-reservation sensitive receptors would not occur. Quantification of construction DPM emissions is provided in **Appendix F**.

There would be a less-than-significant impact.

Operation

Off-reservation DPM emissions would primarily occur from vendor trips and charter buses; however, the levels of emissions from these types of vehicles are not sufficient to expose nearby sensitive receptors to substantial DPM concentrations. As discussed in **Section 4.8** and **4.14**, a water recycling facility may be constructed on the reservation in order to produce reclaimed water for non-potable uses. If constructed, the system would be on the reservation and would not cause off-reservation impacts. Because the facility would only remove tertiary water from the wastewater stream, and not treat or dispose of solids, there would be no odors associated with the facility.

There would be a less-than-significant impact.

4.3.4 MITIGATION MEASURES

4.3-1

- The Tribe shall require off-road construction equipment to utilize tier 3 engines as defined by the USEPA's Vehicle Emission and Fuel Standards Program. In addition, construction equipment shall be operated with a level 3 diesel particulate filter.
- Exposed soil shall be sprayed with water or other suppressant at least twice a day or as needed.
- Dust emissions shall be minimized during transport of fill material or soil by wetting-down loads, ensuring adequate freeboard (space from the top of the material to the top of the truck bed) on trucks, and/or covering loads.
- Dirt, gravel, and debris piles shall be covered as needed to reduce dust and wind-blown debris.
- A 15 mile per hour speed limit shall be enforced on unpaved roads.
- CAPs, GHG, and DPM emissions shall be minimized during operation of the Proposed Project by requiring that diesel-powered vehicles and equipment be properly maintained and minimizing idling time to five minutes at loading docks when loading or unloading food, merchandise, etc. or when diesel-powered vehicles or equipment are not in use; unless per engine manufacturer's specifications or for safety reasons more time is required.

- The Tribe shall encourage turning off bus engines instead of idling for extended periods during operation of the Proposed Project.
- Adequate ingress and egress at entrances shall be maintained to minimize vehicle idling and traffic congestion.
- To the extent feasible, the Proposed Project shall utilize super compliant low volatile organic compounds (VOC) for architectural coatings.
- To the extent feasible, recycling bins shall be installed throughout the Resort for glass, cans, and paper products. Trash and recycling receptacles shall be placed strategically outside to encourage people to recycle. In addition, to the extent feasible, the Tribe shall promote the use of non-polystyrene take-out containers and encourage food waste composting programs at restaurants.
- The Proposed Project shall use energy-efficient lighting and appliances to the extent feasible, which would reduce indirect CAP and GHG emissions.
- The Tribe shall consider and, to the extent feasible, incorporate preferential parking for Plug-In Electric Vehicles, along with the installation of corresponding electric vehicle charging stations into the design of the Proposed Project.

4.4 BIOLOGICAL RESOURCES

This section addresses the off-reservation environment associated with biological resources, discusses the impacts of the Proposed Project on off-reservation biological resources, and presents mitigation measures, if necessary, to reduce potentially significant off-reservation environmental impacts associated with the Proposed Project.

4.4.1 REGULATORY SETTING

Federal

Federal Endangered Species Act

Provisions of the federal Endangered Species Act of 1973 (FESA), as amended (16 United States Code [USC] 1531), protect federally-listed threatened and endangered wildlife and their habitat from take (50 CFR §17.11, 17.12). Under FESA, "take" includes activities that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" as well as any "attempt to engage in any such conduct" (16 USC 1531[3]). Additionally, the USFWS and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) implement Section 10(a)(1)(b) of FESA, which allows entities under consultation with the USFWS and NMFS to obtain incidental take permits for federally listed fish and wildlife.

"Critical Habitat" is defined under FESA as specific geographic areas within a listed species range that contain features considered essential for the conservation of the listed species. Critical Habitat for a given species supports habitat deemed by USFWS to be important for the recovery of the species. Under FESA, habitat loss is considered to be an impact to the species.

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 the MBTA. As such, project-related disturbances must be reduced or eliminated during the nesting season.

Wetlands and Other Waters of the United States

A project that involves discharge of dredged or fill material in off-reservation navigable Waters of the U.S. must first obtain authorization from the U.S. Army Corps of Engineers (USACE), under Section 404 of the Clean Water Act (CWA). Projects requiring a 404 permit under the CWA also require a Section 401 certification from either the U.S. Environmental Protection Agency (USEPA) for trust land, or the Regional Water Quality Control Board (RWQCB) for non-trust land. These two agencies also administer the National Pollutant Discharge Elimination System general permits for construction activities disturbing one acre or more.

State and Local

The project site is located on trust land and is therefore not subject to State or local laws and regulations concerning biological resources. However, such laws and regulations apply to off-reservation land in the vicinity of the project site.

California Endangered Species Act

The California Endangered Species Act (CESA) is similar to FESA, but is limited to species under state jurisdiction listed by the state as threatened or endangered. Under Section 2080 of the California Fish and Game Code, off-reservation take is prohibited. Take is defined as activities that "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Under Section 2081, the California Department of Fish and Wildlife (CDFW) can authorize take if an incidental take permit is issued by the Secretary of the Interior or Commerce in compliance with FESA for jointly listed species, or if the director of CDFW issues a permit and impacts are minimized and mitigated for State listed species. In general, CESA does not cover habitat impacts.

California Department of Fish and Game Code

California Fish and Game Code~~s~~ Sections ~~§~~ 3503, 3503.5, and 3800 prohibit the off-reservation possession, incidental take, or needless destruction of birds, their nests, and eggs. California Fish and Game Code § 3511 lists birds or other species that are "fully protected" off-reservation and may not be taken or possessed except under specific permit. Consultation with CDFW may be required if construction would potentially impact off-reservation state-listed species or nesting raptors.

California Fish and Game Code Section 1602

California Fish and Game Code Section 1602 requires notification before beginning off-reservation activities that obstruct or divert the natural flow of an off-reservation river, stream, or lake; change or use of any material from the bed, channel, or bank of an off-reservation river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into an off-reservation river, stream, or lake. California Fish and Game Code Section 1602 applies to off-reservation perennial, intermittent, and ephemeral bodies of water in California.

Santa Rosa Plain Conservation Strategy

In cooperation with the USEPA, USACE, CDFW, and RWQCB, USFWS has developed a strategy to conserve and contribute to the recovery of certain federally listed species of the Santa Rosa Plain and their habitats. The Santa Rosa Plain Conservation Strategy identifies potential habitat and survey guidelines for five special-status species known to occur on the Santa Rosa Plain; California Tiger Salamander (CTS), Burke's goldfields, Sonoma sunshine, Sebastopol meadowfoam, and many-flowered navarretia (USFWS, 2005).

Recovery Plan for the Santa Rosa Plain

The Recovery Plan for the Santa Rosa Plain was developed by the USFWS and identifies actions that USFWS feels are prudent to recover or protect Sonoma sunshine, Burke's goldfields, Sebastopol meadowfoam, and California tiger salamander (Sonoma County Distinct Population Segment). The Recovery Plan considers habitat loss and degradation the primary threat to all four of these species. Therefore, the Recovery Plan proposes surveys to identify high-quality habitat with continuity of habitat, preservation and maintenance of high-quality habitat, and restoration with possible introduction.

Laguna de Santa Rosa Foundation

The planners of the Laguna de Santa Rosa Foundation brought together a task force of private organizations and public agencies ~~. The purpose of the task force was~~ to develop management guidelines within a 21,000-acre core planning area. As a result of the task force, the Enhancing and Caring for the Laguna plan was drafted (Laguna de Santa Rosa Foundation, 2006).

This Plan discusses preservation of biological diversity, identifying watersheds and sustaining water resources, controlling invasive species, and developing trails and recreational facilities. In coordination with the Sonoma Land Trust, the Laguna de Santa Rosa Protection Plan was drafted. The goal of the Laguna De Santa Rosa Protection Plan is to preserve wetlands, vernal pools, valley oak savannah, riparian woodlands, and special-status species.

Sonoma County Agricultural Preservation and Open Space District Comprehensive Plan 2021

In 2000, the Sonoma County Agricultural Preservation and Open Space District (SCAPOSD, also known as Ag + Open Space) adopted a plan to purchase land and easements and identified the Laguna de Santa Rosa as a priority riparian and wetland area~~,~~ and a priority greenbelt area. The 2006 plan further developed those goals. In 2021, the ~~Sonoma County Agricultural Preservation and Open Space District (~~SCAPOSD~~ also known as Ag + Open Space~~) adopted a long-range comprehensive plan through 2031. The current plan further develops land strategies and actions, incorporating new data to inform conservation strategies and actions within Sonoma County and provides interactive maps outlining specific priority areas (SCAPOSD, 2021).

Sonoma County General Plan

The Open Space and Resource Conservation Element of Sonoma County's ~~the~~ general plan identifies goals and policies of the County for preserving natural resources and recreational open space. This element identifies scenic resource areas, biotic resource areas, important environmental areas, and important open space areas.

City of Rohnert Park General Plan, NWSP, and WDSP

Section 6.2 of the Rohnert Park General Plan outlines local habitats and biological resources, including wetlands, vernal pools, and special-status species. Conservation measures are proposed to protect and enhance valuable biological resources (City of Rohnert Park, 2000). The Rohnert Park General Plan states that a specific plan process is necessary for the northwest area to plan for land uses. The Northwest Specific Plan (NWSP) area is immediately east of the ~~Graton~~ Resort~~ and Casino~~. The Northwest Specific Plan provides development standards that regulate new development concerning height, building setbacks, parking requirements, and other development features. The Wilfred/Dowdell Village Specific Plan (WDSP) applies to approximately 20.19 acres generally south of Wilfred Avenue. The Specific Plan was approved by the City in 2008. The Wilfred/Dowdell Village Specific Plan area has a 2020 General Plan designation of Regional Commercial (City of Rohnert Park, 2000).

4.4.2 ENVIRONMENTAL SETTING

The project site is situated on paved parking lots serving the existing Resort. T~~t~~he R~~r~~eservation is located in an area dominated by agricultural land uses, commercial development, and rural residential development. Currently, the portion of the reservation that contains the project site is developed with the existing Resort and associated structures.

Biological Study Area

For the purpose of this report, the Biological Study Area (BSA) is defined as the off-reservation area within which the Proposed Project may result in impacts to biological resources (**Figure 7**). As discussed above, areas that are on-reservation and under Tribal jurisdiction are therefore not included in the BSA. Areas that are paved, developed, heavily disturbed independent of the Proposed Project, or far enough away to be outside of impact range~~,~~ have also been eliminated from further analysis.

Biological surveys have been conducted in surrounding off-reservation areas from 2004 to 2022 to assess and identify biological resources. During these surveys, plant species identification, nomenclature, and taxonomy followed either *The Jepson Manual: Higher Plants of California* (Hickman et al., 1993) or *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin, 2012), depending on the date of the survey. Supplementary background information regarding fishery resources of the Laguna de Santa Rosa was obtained from the 2011 Essential Fish Habitat Assessment (EFHA) completed by Analytical Environmental Service (AES, 2011). Additional information was obtained from the 2009 Biological Opinion (BO) by the U.S. Fish and Wildlife Service (USFWS) (USFWS, 2009) and the 2006 Biological Assessment (BA) prepared for the existing Resort by Huffman-Broadway Group, Inc. (Huffman, 2006).

Habitat Types

Habitat types of the BSA were characterized and evaluated for their potential to support regionally occurring special-status species and were assessed for the presence of potentially jurisdictional Waters of the U.S., isolated wetlands, wildlife corridors, and other biologically sensitive features. The following habitat types were identified within the BSA (**Figure 8**).

Ruderal/Disturbed

Ruderal/disturbed habitat within the BSA consists of unmanaged areas dominated by non-native plant species. These areas are highly disturbed by surrounding development or agricultural uses but could possibly return to a more natural state if left undisturbed. The ruderal/disturbed portions of the BSA consist of the shoulders of paved roadways, dirt/gravel roadways, ruderal fields, and highly disturbed areas that can no longer be classified as another habitat because of such low density or diversity of native plant species.

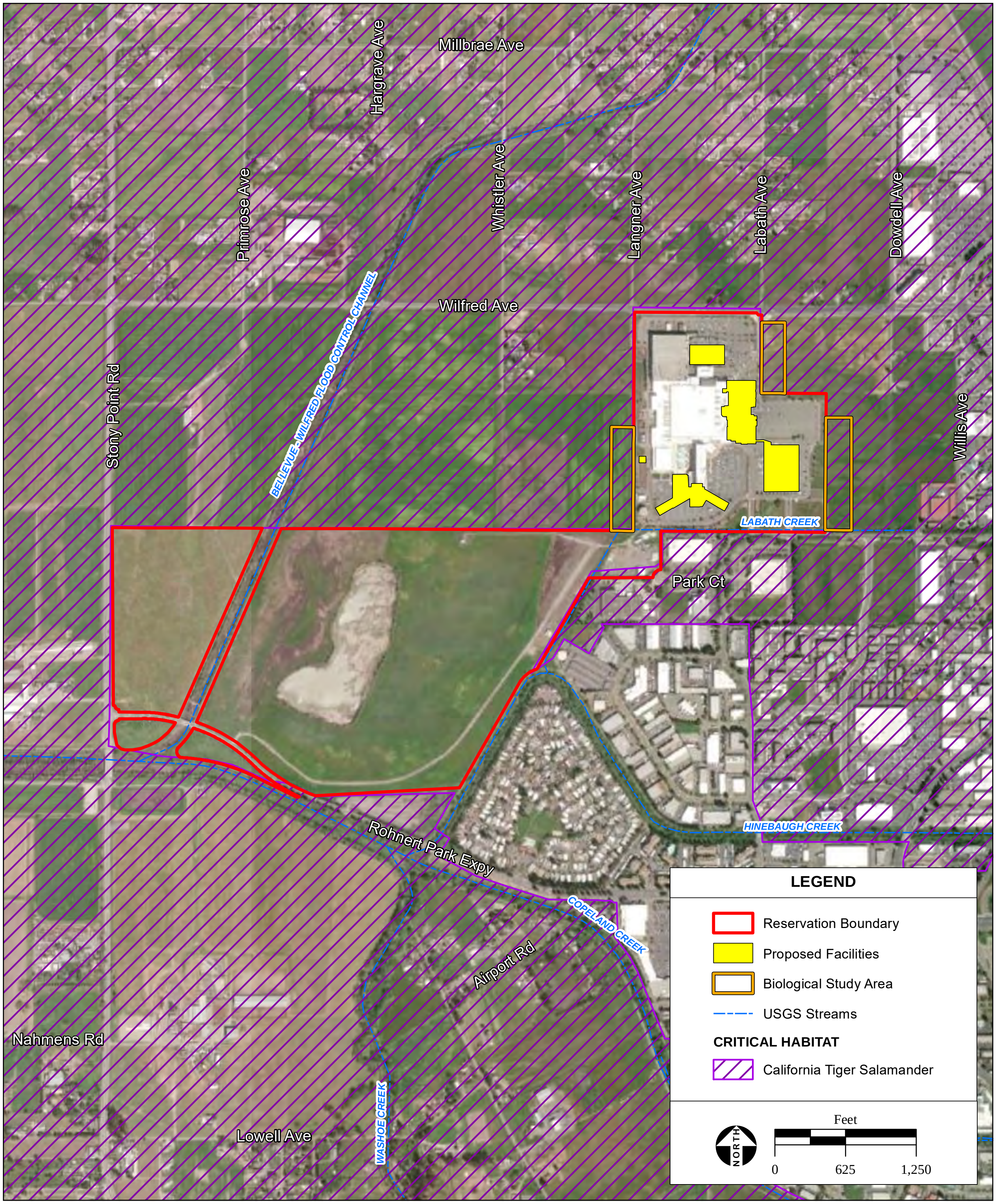
Plant species common in this habitat include perennial ryegrass (*Lolium perenne*), bristly ox-tongue (*Helminthotheca echioides*), curly dock (*Rumex crispus*), field mustard (*Brassica rapa*), orchard grass (*Dactylis glomerata*), and cheeseweed (*Malva parviflora*). This habitat can provide low to medium habitat value for wildlife but does not provide habitat for native plants as non-native species planted for agriculture are dominant and will outcompete native species or will be removed as part of agricultural activities. This habitat category typically provides low habitat value for wildlife as it has been so highly disturbed or developed. These areas may provide marginal habitat for native plants and wildlife, however, native plants were generally not present as non-native species generally outcompeted them.

Isolated Wetlands

Isolated wetlands occur on-reservation and off-reservation within the BSA (**Figure 8**). Regarding on-reservation wetlands, the USACE issued a CWA Section 404 permit to the Tribe prior to initial construction of the Resort, which required wetland protection through the use of setbacks and monitoring.

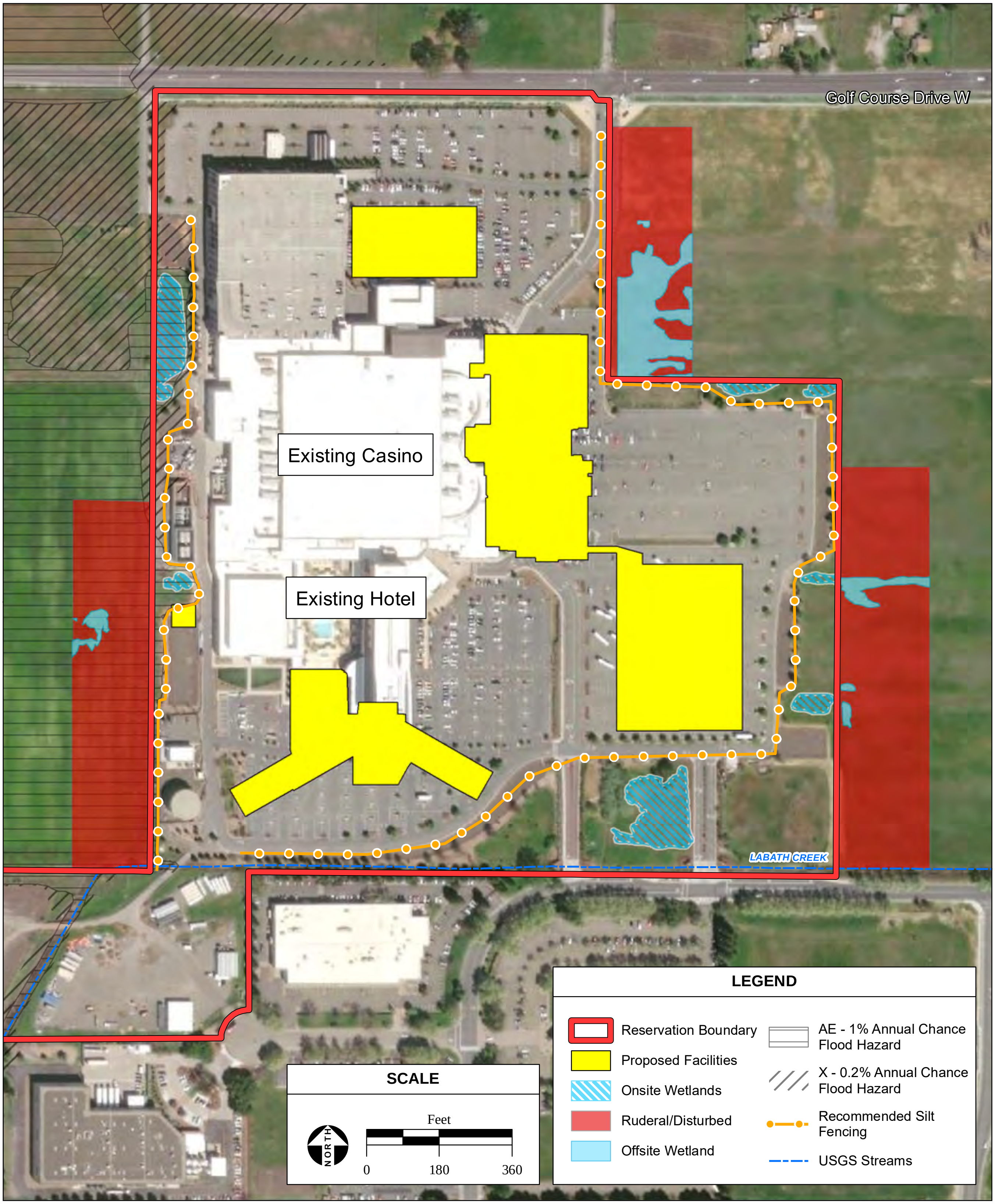
Waters of the U.S.

Potentially jurisdictional W~~w~~aters of the U.S. are located in the vicinity of the project site. Labath Creek is a small, intermittent, linear channel modified for flood control located in the BSA between Labath Avenue and Business Park Drive. Labath Creek flows south into Hinebaugh Creek, thence the Laguna de Santa Rosa, thence the Russian River, thence the Pacific Ocean. Labath Creek, Hinebaugh Creek, and the Laguna de Santa Rosa are classified by the County and City as flood control channels and are managed by the Sonoma County Water Agency (NMFS, 2008).



SOURCE: Vivid Maxar aerial photography, 4/16/2021; AES-Montrose, 10/25/2022

Figure 7
Biological Study Area



SOURCE: Maxar aerial photograph, 4/16/2021; FEMA, 2022; AES-Montrose, 10/26/2022

Figure 8
Habitat Types of the Biological Study Area

Labath Creek flows south into Hinebaugh Creek, thence the Laguna de Santa Rosa, thence the Russian River, thence the Pacific Ocean. Labath Creek, Hinebaugh Creek, and the Laguna de Santa Rosa are classified by the County and City as flood control channels and are managed by the Sonoma County Water Agency (NMFS, 2008). Labath Creek is low gradient, dense in emergent vegetation, and has a bed of fine silt. No coarse substrates are present in the creek. Instream habitat complexity is minimal and water supply is dependent on stormwater runoff. Species occurring in Labath Creek include: water smartweed (*Polygonum punctatum*), willow-herb (*Epilobium ciliatum* ssp *ciliatum*), white sweet clover (*Melilotus alba*), and curly dock (*Rumex crispus*). Labath Creek, Hinebaugh Creek, and the Laguna de Santa Rosa are not designated as Critical Habitat for anadromous fish species, however, these features are considered potential waters of the U.S. subject to USACE jurisdiction.

A small man-made drainage ditch occurs in the BSA west of the project site. The drainage ditch runs north to south and carries water after heavy periods of rain. Vegetation is minimal, and comprised of non-native plant species. The drainage ditch lacks hydrologic capacity as well as suitable habitat to support anadromous fish species (AES, 2011). The Bellevue-Wilfred Channel bisects the southwestern portion of the reservation from north to south, and the Laguna de Santa Rosa transects the southwestern portion of the reservation from east to west. In the vicinity of the Reservation, the Laguna de Santa Rosa is a broad, shallow channel. It is the Russian River's largest tributary and one of the larger freshwater wetlands in northern California (Sonoma Land Trust and Laguna de Santa Rosa Foundation, 2003). The Bellevue-Wilfred Channel is a channelized drainage that flows into the Laguna de Santa Rosa south of the reservation. Wetlands contained within the BSA as well as Labath Creek have previously been evaluated by USACE, and USACE has considered these features W~~w~~aters of the U.S. subject to USACE jurisdiction.

Critical Habitat

Designated Critical Habitat for CTS occurs within the BSA (**Figure 7**) in accordance with the Santa Rosa Plain Conservation Strategy. The closest known occurrence for the species is located near the corner of Stony Point Road and Wilfred Avenue/Golf Course Drive. The adjacent off-reservation areas are largely within a floodplain west of the project site and outside of the BSA. No recent occurrences of CTS have been documented in the BSA.

Special-Status Species

For the purposes of this document, "special-status" is defined to include off-reservation species that are:

- Listed as endangered or threatened under FESA (or formally proposed as/candidates for listing);
- Listed as endangered or threatened under CESA (or formally proposed as/candidates for listing);
- Designated as endangered or rare, pursuant to CFG Code 1901;
- Designated as fully protected, pursuant to CFG Codes 3511, 4700, or 5050~~)~~;
- Designated as species of concern by CDFW;
- Defined as rare or endangered under CEQA; or
- Considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (lists 1B and 2).

Off-reservation special-status species with the potential to occur in the vicinity of the project site were identified based on survey findings, a review of pertinent literature, aerial photographs, topographic maps, and special-status species lists from the USFWS, California Native Diversity Database (CNDDB), and CNPS. Special-status species lists are included in **Appendix H**. The USFWS list was generated using the Information for Planning and Consultation online program for the BSA.

The CNDDB list was developed by querying the online database for special-status species records within the Cotati 7.5-minute quadrangle. The CNPS list was obtained by querying the CNPS Online Inventory of Rare and Endangered Plants program for special-status species records within the Cotati 7.5-minute quadrangle.

Table 4.4-1 lists the name, list status, distribution, habitat requirements, period of identification, and potential to occur within the BSA for each of the regionally occurring special-status species identified in the CNDDB, CNPS, and USFWS species lists. For each species, necessary habitat requirements were assessed and compared with the habitats identified within the BSA (**Figure 8**). Species that are not addressed further were determined to have no potential to occur in the off-reservation vicinity of the project site based on elevational distribution, specific habitat requirements, soil requirements, and other environmental needs.

Based on the results of surveys and the review of regionally occurring special-status species and their habitat requirements, portions of the BSA may provide potential habitat for two special-status species. Special-status species with the potential to occur in the BSA are discussed in **Table 4.4-1**. No special-status species were observed within the BSA during the biological surveys. Special-status species that do not have to potential to occur in the BSA due to lack of suitable habitat are not discussed further.

4.4.3 Impact Analysis

Significance Criteria

The following criteria are established by the off-reservation Environmental Impact Analysis Checklist (**Appendix A**) and have been used in this section to evaluate potential off-reservation environmental impacts of the Proposed Project to off-reservation biological resources. Such impacts are considered significant if they would:

- Have a substantial adverse impact, either directly or through habitat modifications, on any species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;
- Have a substantial adverse effect on any off-reservation riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Assessment of existing off-reservation biological resources was based on biological resources surveys conducted to document existing habitat types and determine the potential for the occurrence of special-status species. AES biologists have conducted biological surveys on and in the vicinity of the BSA since 2004. The BSA was assessed for the presence of waters of the U.S., isolated wetlands, special-status species, and other biologically sensitive features.

TABLE 4.4-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

SCIENTIFIC NAME **COMMON NAME**	**LIST STATUS**	**DISTRIBUTION**	**HABITAT REQUIREMENTS**	**IDENTIFICATION PERIOD**	**POTENTIAL TO OCCUR IN BSA**
PLANTS					
Alopecurus aequalis ssp. sonomensis Sonoma alopecurus	FE/--/1B	Known to have fewer than five native occurrences in Marin and Sonoma counties.	Found in freshwater marshes and swamps, and riparian scrub. Elevation 5 to 210 m.	May-July	**Yes.** The BSA may contain potential habitat for this species.
Amorpha californica var. *napensis* Napa false indigo	--/--/1B.2	Known to occur in Lake, Monterey, Marin, Napa, and Sonoma counties.	Found in broad-leafed upland forest (openings), chaparral, and cismontane woodland habitats. Elevations range from 0-2000 m.	April-July	**No.** The BSA does not contain suitable habitat for this species.
Blennosperma bakeri Sonoma sunshine	FE/CE/1B.1	Known to occur in the Laguna de Santa Rosa and Sonoma areas of Sonoma County.	Found in wetland areas, vernal pools and mesic grassland. Elevation 10 to 110 m.	March-May	**Yes.** The BSA may contain potential habitat for this species.
Centromadia parryi ssp. parryi Pappose tarplant	--/--/1B.2	Known to occur in Butte, Colusa, Glenn, Lake, Napa, San Mateo, Solano, Sonoma, and Yolo Counties.	Annual herb found in chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), and valley and foothill grassland (vernally mesic/ often alkaline). Elevations: 2-420 m.	May-November	**Yes.** The BSA may contain potential habitat for this species.
Downingia pusilla dwarf downingia	--/--/2B.2	Known to occur in Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties.	Found in wetland areas, mesic grasslands, and vernal pools. Elevation 0 to 445 m.	March-May	**Yes.** The BSA may contain potential habitat for this species.
Hemizonia congesta ssp. Congesta congested-headed hayfield tarplant	--/--/1B.2	Known to occur in Mendocino, Marin, San Francisco, San Mateo and Sonoma counties.	Found on roadsides and grasslands. Elevation 20 to 560 m.	April-November	**Yes.** The BSA may contain potential habitat for this species.
Lasthenia burkei Burke's goldfields	FE/CE/1B	Known to occur in southern Mendocino County, southern Lake County, and northeastern Sonoma County.	Found in wetlands, vernal pools, and moist meadows. Elevation 15 to 600 m.	April-June	**Yes.** The BSA may contain potential habitat for this species.
Limnanthes vinculans Sebastopol meadowfoam	FE/CE/1B	Known to occur in Sonoma County and one occurrence in Napa County.	Found in vernal pools, vernally moist sites in meadows, and grassland. Elevation 15 to 305 m.	April-May	**Yes.** The BSA may contain potential habitat for this species.
Microseris paludosa marsh microseris	--/--/1B.2	Known to occur in Mendocino, Monterey, Marin, San Benito, San Luis Obispo, Santa Cruz, Solano, and Sonoma counties, as well as San Francisco and San Mateo counties (though may be extirpated).	Perennial herb found in moist valley and foothill grasslands, open woodlands, closed-cone coniferous forest, coastal scrub. Elevations range from; 5-355 m.	April-July	**Yes.** The BSA may contain potential habitat for this species.

SCIENTIFIC NAME **COMMON NAME**	**LIST STATUS**	**DISTRIBUTION**	**HABITAT REQUIREMENTS**	**IDENTIFICATION PERIOD**	**POTENTIAL TO OCCUR IN BSA**
Pleuropogon hooverianus North Coast semaphore grass	--/CT/1B.1	Known to occur in Mendocino, Marin, and Sonoma counties.	Broadleafed upland forest, Meadows and seeps, and North Coast coniferous forest/open areas, mesic. Elevations; 10-671 m.	April-June	**Yes.** The BSA may contain potential habitat for this species.
Rhynchospora globularis round-headed beaked-rush	--/--/2B.1	Within California, known only in Sonoma County.	Perennial rhizomatous herb found in freshwater wetlands, marshes and in riparian areas. Elevations range from 40 - 60 m.	July-August	**No.** The BSA is outside the known elevation range of this species.
Trifolium amoenum two-fork clover	FE/--/1B.1	Known to occur in Marin and San Mateo counties, as well as Alameda, Napa, Santa Clara, Solano,and Sonoma counties (though may be extirpated).	Annual herb found in coastal bluff scrub and valley and foothill grassland habitats sometime in serpentine soil at elevations ranging from 5 - 415 m.	April-June	**Yes.** The BSA may contain potential habitat for this species.
Trifolium hydrophilum saline clover	--/--/1B.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Monterey, Napa, Sacramento, San Benito, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, and Yolo counties.	Annual herb found in marshes and swamps, valley and foothill grassland that are occasionally on mesic, alkaline soils, and vernal pools. Elevations range from 0-300 m.	April-June	**Yes.** The BSA may contain potential habitat for this species.
ANIMALS					
Mammals					
Taxidea taxus American badger	--/CSC/--	Found throughout most of california in suitable habitat.	Suitable habitat occurs in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, parklands, and cold desert areas.	All Year	**No.** The BSA does not contain suitable habitat for this species.
Crustaceans					
Syncaris pacifica California freshwater shrimp	FE/CE/--	Known to occur in Marin, Napa, and Sonoma counties.	Found in low gradient, perennial coastal streams typically 1-3 feet deep, with exposed live roots along undercut banks and overhanging woody debris or vegetation.	All Year	**No.** The BSA does not contain suitable habitat for this species.
Fish					
Oncorhynchus mykiss steelhead – central California coast DPS	FT/CH/--	Federal listing includes all runs in coastal basins from the Russian River south to Soquel Creek including San Francisco and San Pablo bays.	Found in permanent or nearly permanent water in a wide variety of habitats.	Consult Agency	**No.** The BSA does not contain suitable habitat for this species.

SCIENTIFIC NAME COMMON NAME	LIST STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	IDENTIFICATION PERIOD	POTENTIAL TO OCCUR IN BSA
Amphibians					
Ambystoma californiense California tiger salamander	FT/CSC/--	Known to occur in western California from Sonoma County in the north to Santa Barbara County in the south.	Breeds in vernal pools and ponds of grassland and open woodland of low hills and valleys. Will utilize burrows for refuge.	November-February (adults) March 15-May15 (larvae)	**Yes.** The BSA may contain potential habitat for this species. Designated Critical Habitat for this species is present in the BSA.
Rana boylii foothill yellow-legged frog	--/CSC/--	Known to occur in the Oregon Cascades south to the Sierra San Pedro Martir, Baja California, Mexico; including the Sierra Nevada, North Coast ranges, and San Gabriel Mountains.	Found in partly shaded shallow streams and riffles with a rocky substrate.	May-November	**No.** The BSA does not contain suitable habitat for this species.
Rana draytonii California red-legged frog	FT/CSC/--	Known to occur along the Coast from Mendocino County to Baja, inland through the northern Sacramento Valley into the foothills of the Sierra Nevadas, south to eastern Tulare County, and possibly eastern Kern County. Currently accepted range excludes the Central Valley.	Occurs in permanent and temporary pools of streams, marshes, and ponds with dense grassy and/or shrubby vegetation. Elevations range from 0-1160 m.	November – March (breeding) June – August (non-breeding)	**No.** The BSA does not contain suitable habitat for this species.
Reptiles					
Emys marmorata western pond turtle	--/CSC/--	Known to occur in western Washington to Baja California, Mexico west of the Cascade, Sierra Nevada, and Peninsular Mountain axis.	Found in permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nests found up to 0.5 miles from water.	Consult Agency	**No.** The BSA does not contain suitable habitat for this species.
Chelonia mydas green sea turtle	FT/--/--	Globally distributed and generally found in tropical waters along continental coasts and islands between 30°N and 30°S. In the eastern North Pacific, occurs from Baja to southern Alaska.	Nests on oceanic beaches, feeds in benthic grounds in coastal areas, and frequents convergence zones in the open ocean.	Consult Agency	**No.** The BSA does not contain suitable habitat for this species.
Birds					
Strix occidentalis caurina northern spotted owl	FT/CT; CSC/--	Geographic range extends from British Colombia to northwestern California south to San Francisco. The breeding range includes the Cascade Range, North Coast Ranges, and the Sierra Nevada. Some breeding populations also occur in the Transverse Ranges and Peninsular Ranges.	Resides in mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2,300 m. Prefer old-growth forests, but use of managed lands is not uncommon. Nesting habitat is a tree or snag cavity. Requires a nearby permanent source of water. Foraging habitat consists of any forest habitat with sufficient prey.	Year-round	**No.** The BSA does not contain suitable habitat for this species.

SCIENTIFIC NAME **COMMON NAME**	**LIST STATUS**	**DISTRIBUTION**	**HABITAT REQUIREMENTS**	**IDENTIFICATION PERIOD**	**POTENTIAL TO OCCUR IN BSA**
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT/CE/--	Known to occur in isolated pockets in the San Francisco Bay region, Mojave Desert, and San Diego region of California; south to Mexico.	Found in lowland riparian habitats. Nest and seek cover in densely foliaged, deciduous trees and shrubs, especially willows.	June-September	**No.** The BSA does not contain suitable habitat for this species.

SOURCE: USFWS, 2022; CDFW, 2022; CNPS, 2022

STATUS CODES

FEDERAL: United States Fish and Wildlife Service
FE Federally Endangered
FT Federally Threatened
FC Candidate for Federal Listing

STATE: California Department of Fish and Game
CE California Listed Endangered
CT California Listed Threatened
CR California Rare
CSC California Species of Special Concern

CNPS: California Native Plant Society (California Rare Plant Rank (CRPR))
1A Plants Presumed Extinct in California
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2B Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

CNPS Threat Ranks:
0.1 – Seriously Threatened in California (Over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 – Fairly Threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

The off-reservation impact assessment was based on information gathered from field surveys and the environmental setting described in **Section 4.4.2** and the significance criteria presented above. Supplementary background information regarding fishery resources of the Laguna de Santa Rosa was obtained from the EFHA (AES, 2011). Additional information was obtained from the BO (USFWS, 2009) and BA (Huffman, 2006).

Impact 4.4-1: The Proposed Project could have a substantial adverse impact, either directly or through habitat modifications, on any species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

Special-status species with the potential to occur within the BSA include 11 special-status plant species and one special-status animal species. No special-status plant species have been observed in the BSA during surveys, thus special-status plants are presumed absent. Additionally, nine out of the 11 special status plant species have the potential to occur in wetland areas, which would be avoided.

The BSA is in an area classified by the USFWS as critical habitat for the endangered Sonoma County Distinct Population Segment of CTS (USFWS, 2022). CTS tunnels were constructed in the vicinity of the BSA along Golf Course Drive/Wilfred Avenue. These tunnels were intended to allow CTS passage under the road, however no CTS occurrences have been identified in the BSA.

During construction of the existing Resort, silt fencing was placed around the edge of the impact area to serve as CTS exclusionary fencing during construction, as required by the BO. Similar to the requirements of the BO, **Mitigation Measure 4.4-1** would address impacts to CTS by installing exclusionary silt fencing that would prevent potentially occurring CTS from entering the project site from off-reservation areas. Silt fencing would also protect on and off-reservation wetlands from impacts.

Marginal nesting habitat for migratory birds is present in the BSA. Construction activities may involve increased machinery, noise levels, and disturbances which have the potential to adversely affect off-reservation nesting migratory bird species. **Mitigation Measure 4.4-2** includes a pre-construction survey for nesting birds and the establishment of an avoidance buffer during construction activities for any identified active nests.

There would be a less-than-significant impact with mitigation.

Impact 4.4-2: The Proposed Project could have a substantial adverse effect on any off-reservation riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

Construction and operation of the Proposed Project would occur on-reservation in a previously developed areas. Therefore, direct impacts to off-reservation habitat would not occur. Prior to and during construction of the Proposed Project, the General Construction NPDES permit from the USEPA under federal requirements of the CWA shall be complied with.

Per the NPDES permit, a SWPPP will be prepared and implemented prior to construction of the Proposed Project, and will contain applicable BMPs to reduce off-reservation impacts associated with stormwater runoff that could potentially affect off-reservation sensitive habitats, including wetlands and Labath Creek. BMPs listed in **Section 3.2.3** would be implemented, and include a SWPPP with measures to protect against off-reservation runoff. **Mitigation Measure 4.4-1** would also be implemented to address potential impacts to on and off-reservation wetlands by installing protective silt fencing.

There would be a less-than-significant impact with mitigation.

Impact 4.4-3: The Proposed Project could have a substantial impact on federally protected off-reservation wetlands as defined by Section 404 of the Clean Water Act.

Direct impacts to off-reservation habitats would not occur as construction activities would be limited to the project site, which is within the reservation. Wetlands have been avoided through the use of setbacks in accordance with a previously issued USACE Section 404 permit. Avoidance is consistent with requirements of the BO originally issued for the development of the existing Resort. Additionally, BMPs listed in **Section 3.2.3** would be implemented, and would include a SWPPP with measures to protect against off-reservation runoff. **Mitigation Measure 4.4-1** would also be implemented to address potential impacts to on and off-reservation wetlands by installing protective silt fencing.

There would be a less-than-significant impact with mitigation.

Impact 4.4-4: the Proposed Project could interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

The Proposed Project does not involve components that would interfere with the movement of native resident or migratory fish or wildlife species. The project site has been previously developed, and there are no migratory wildlife corridors in the BSA. There are no native wildlife nursery sites in the BSA. The movement of native resident or migratory fish or wildlife species, resident or migratory wildlife corridors, and native wildlife nursery sites would not be impacted as a result of construction or operation of the Proposed Project.

There would be no impact.

Impact 4.4-5: The Proposed Project could conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

No HCP/NCCP, or other approved local, regional, or state HCPs have been adopted that are applicable to the Proposed Project, which is located on federal trust land. The Proposed Project avoids wetlands and is consistent with the Santa Rosa Plain Conservation Strategy. No biological resources protected by the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP would be impacted as a result of construction or operation of the Proposed Project.

There would be no impact.

4.4.4 MITIGATION MEASURES

4.4-1 Silt fencing shall be placed along the edge of the project site to serve as CTS exclusionary fencing during construction of the Proposed Project, and will also serve to protect on and off-reservation wetlands from indirect impacts. The fencing protects against the take of CTS by preventing CTS from accessing the project site from the surrounding off-reservation critical habitat.

- Fencing shall be 8 inches minimum in height, and installed in such a way as to not allow CTS to pass underneath it onto the project site.
- ~~CTS signage shall be placed around the project site, and a~~ A qualified biologist will periodically monitor the project site for the presence of CTS.

4.4-2

- Should construction activities take place during the nesting period (March 1 - September 30), a qualified biologist shall conduct a pre-construction survey for ~~raptor~~ migratory bird and raptor nests within 500 feet of the project site.
- The survey shall be conducted within 5 ~~14~~ days of the start of construction.
- If construction activities are delayed or suspended for more than ~~14~~ 5 days after the pre-construction survey, the area shall be resurveyed.
- If no active nests are identified, no further mitigation is necessary.
- If active bird nests are identified, an avoidance buffer shall be implemented based on the identified species and as determined by a qualified biologist. Avoidance buffers may vary in size depending on habitat characteristics, project-related activities, and disturbance levels. Avoidance buffers shall remain in place until the end of the general nesting season or upon determination by a qualified biologist that young have fledged or the nest has failed.

4.5 GEOLOGY AND SOILS

This section discusses the off-reservation environment associated with geological features; analyzes the impacts of the Proposed Project on off-reservation geological features, and presents mitigation measures if necessary to reduce potentially significant off-reservation impacts on geological features. Geological features include topography, soils, geology, and faults.

4.5.1 REGULATORY SETTING

Federal

National Earthquake Hazards Reduction Program

The Earthquake Hazards Reduction Act of 1977 (Public Law 95-124, 42 United States Code 7701 et. seq.), as amended in 2004 (Public Laws 101-614, 105-47, 106-503, and 108-360), established the National Earthquake Hazards Reduction Program. This program was designed to develop measures for earthquake hazards reduction and improve the understanding of earthquakes and their effects.

State and Local

The Proposed Project is located on trust land and is not subject to state or local laws and regulations concerning geological features. However, such laws and regulations apply to off-reservation land in the vicinity of the Proposed Project.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law in December 1972, requires the delineation of zones along active and potentially active faults in California. The California Geological Survey (CGS) defines an "active" fault as one that exhibits evidence of activity during the last 11,000 years. Faults that exhibit evidence of quaternary activity 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 structures for human occupancy across these traces.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was enacted in 1991 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 the zones over which 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 of the site must be conducted and appropriate mitigation measures must be incorporated into the project's design.

Sonoma County General Plan

The Public Safety Element of Sonoma County's General Plan describes geologic hazards specific to the County. Applicable geologic hazards include seismic hazards, fault movement, ground shaking, and ground failure. Reducing risks of geologic hazards to acceptable levels requires special permit review procedures and construction standards. Construction must meet reasonable standards for seismic resistance, site stability, grading, and geologic studies.

City of Rohnert Park General Plan, NWSP, and WDSP

The Rohnert Park General Plan 2020 is the guiding document for development within the City of Rohnert Park's city ~~(City)~~ limits and its ~~the City~~ Sphere of Influence, which includes the Dowdell Property. The General Plan is a document required by state law and adopted by the City Council that is a comprehensive, long-term plan for the physical development and growth of the City. Section 7.1 discusses geology and soils and seismic hazards. Applicable geologic and seismic hazards are similar to those identified in the Sonoma County General Plan 2020. The Northwest Specific Plan (NWSP) area is immediately east of the ~~Graton~~ Resort ~~and Casino~~. The Northwest Specific Plan provides development standards that regulate new development concerning height, building setbacks, parking requirements, and other development features. The Wilfred/Dowdell Village Specific Plan (WDSP) applies to approximately 20.19 acres generally south of Wilfred Avenue.

4.5.2 ENVIRONMENTAL SETTING

Topography

The topography surrounding the project site is flat and includes the developed areas of Rohnert Park to the east and north and flat agricultural land with sparse residential development to the north and west. With the exception of depressed waterways, the project site and surrounding lands are generally flat and level with slopes of less than 1 percent and elevations ranging from approximately 85 feet above msl to 93 feet above msl. The major drainageways in the area include the Bellevue-Wilfred Channel and the Laguna de Santa Rosa. The former traverses the larger, western portion of the reservation in a northeasterly direction, while the latter forms a portion of the southern boundary. Both channels intersect at the southwest corner of the reservation.

Soils

The project site is located within the Santa Rosa Plain. The Santa Rosa Plain is characterized by fluvial and alluvial deposits, as well as basin sediment. The project site is currently paved, and has been built up with several feet of engineered fill consistent with the requirements of the 2009 Environmental Impact Statement prepared for the existing Resort (AES, 2009). Below the engineered fill the project site is Clear Lake clay (CeA) and~~,~~ sandy substratum (NRCS, 2021). Beneath the upper layers are alluvial strata comprised of basic and sedimentary rock. Clays in the Clear Lake series are characterized by slow permeability, slow runoff, and have a slight erosion hazard.

Mineral Resources

Quaternary and cretaceous geologic formations make up the majority of rocks in the Coast Range, including sandstone, mudstone, and conglomerates, with some volcanoclastic rocks (CGS, 2006; USGS, 2021a). The nearest known mineral resources in relation to the project site are a surface perlite prospect and a stone quarry located approximately 2.7 miles northeast, as well as a stone quarry located approximately 2.7 miles south (USGS, 2021a).

Seismicity

Potentially active faults are faults that have shown signs of seismic activity during the last 1.6 million years. The closest fault zone to the project site is the Rodgers Creek fault zone, located approximately 4.5 miles east of the project site (DOC, 2022a and 2022b). This fault zone has known activity within the last 700,000 years.

USGS modeling has shown that a rupture event within the Hayward fault system has the potential to result in the rupture within the Rodgers Creek fault system, with a modeled seismic event of up to a magnitude 7.2 seismic event (USGS, 2021b). Additionally, the Tolay fault system is located approximately 3 miles south of the project site. The Tolay fault system is an age-undifferentiated quaternary fault system that is mapped within the California Department of Conservation (DOC) Fault Activity Mapper but is not represented on the Department of Conservation Alquist-Priolo map (DOC, 2022b). There are no faults designated by the Alquist-Priolo Act within the vicinity of the project site (DOC, 2022a).

The Sonoma County Hazard Mitigation Plan has also evaluated the potential inundation area for the failure of the Lake Sonoma Dam. The outer extent of the inundation area is immediately to the north and west of the project site (Sonoma County, 2011; Sonoma County, 2021). Surface ruptures occur when movement along both sides of a fault located deep underground produces enough energy to cause a fracture on the surface. The project site and its immediate vicinity are not located within an Alquist-Priolo Earthquake Fault Zone or in a Seismic Hazard Zone as defined by the Seismic Hazards Mapping Act (DOC, 2022a). The USGS has prepared models of rupture events for the Rodgers Creek fault system, which is the nearest earthquake fault zone to the project site. Models show that rupture of a fault within the Rodgers Creek fault system has the potential to result in surface rupture of approximately three feet (USGS, 2021b).

Landslides

The project site is not located in a Landslide Hazard Area as mapped within the Sonoma County Hazard Mitigation Plan (Sonoma County, 2016b; Sonoma County, 2021). The nearest known landslide in relation to the project site occurred approximately 5 miles east along the more steeply sloped banks of the South Fork Matanzas Creek (USGS, 2021c). Landslides pose little natural hazard in the areas surrounding the project site due to the relatively flat topography of the project site and vicinity.

Liquefaction

Soils comprised of sand and sandy loams in areas with high groundwater tables or rainfall are subject to liquefaction during intense seismic shaking events. Soils on the project site and surrounding lands are well drained, with a depth to water table of greater than 80 inches, and do not contain high quantities of sand (NRCS, 2021). The area in the vicinity of the project site has been mapped by the Sonoma County Hazard Mitigation Plan as having a moderate potential for liquefaction (Sonoma County 2016c; Sonoma County, 2021).

4.5.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by the Off-reservation Environmental Impact Analysis Checklist (**Appendix A**) and have been used in this section to evaluate potential off-reservation impacts of the Proposed Project on geological features. Such impacts are considered significant if they would:

- Expose off-reservation people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
- Expose off-reservation people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking;

- Expose off-reservation people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction;
- Expose off-reservation people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides; or
- Result in substantial off-reservation soil erosion or the loss of topsoil.

Off-reservation impacts of the Proposed Project with respect to geological features were analyzed based on existing soil types and topography of the project site and surrounding off-reservation vicinity, the proximity of the project site to known faults, information in the grading and drainage report (**Appendix D**), and the potential of the Proposed Project to impact existing off-reservation geological features.

Impact 4.5-1: The Proposed Project could expose off-reservation people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.

The project site is located approximately 4.5 miles from the Rodgers Creek fault zone, which is the nearest fault system identified by the California Department of Conservation's Alquist Priolo mapping (DOC, 2022a). The Proposed Project would be confined to trust land and built in accordance with the Compact, which requires the construction of the Proposed Project be built to applicable building codes and would not generate an off-reservation risk of loss, injury, or death involving rupture of a known earthquake fault (Compact, 2012). Implementation of the Proposed Project would not increase the exposure of off-reservation people or structures to adverse effects in the event of fault rupture.

There would be a less-than-significant impact.

Impact 4.5-2: The Proposed Project could expose off-reservation people or structures to substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking.

Regional seismic activities have the potential to impact the Lake Sonoma Dam and generate post-earthquake fire risks (Sonoma County, 2021). In the event of dam failure, the inundation area has the potential to reach the vicinity of the project site, and post-earthquake fires may spread beyond those areas subject to strong seismic ground shaking. However, the Proposed Project does not involve off-reservation construction or activities, and the Proposed Project does not include components that would expose off-reservation people or structures to seismic-related ground failure. To ensure the protection and safety of patrons, employees, and guests, existing and future buildings are and will be inspected by certified inspectors in accordance with Section 6.4.2 of the Compact (Compact, 2012).

There would be a less-than-significant impact.

Impact 4.5-3: The Proposed Project could expose off-reservation people or structures to substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction.

The off-reservation vicinity of the project site is within an area mapped by the Sonoma County Hazard Mitigation Plan as having a moderate liquefaction potential (Sonoma County 2016c; Sonoma County, 2021). Review of the soils present in the vicinity of the project site shows a prevalence of Clear Lake clay, which does not display characteristics of soils prone to liquefaction. To ensure the protection and safety of patrons, employees, and guests, existing and future buildings are and will be inspected by certified inspectors in accordance with Section 6.4.2 of the Compact (Compact, 2012).

There would be no impact.

Impact 4.5-4: The Proposed Project could expose off-reservation people or structures to substantial adverse effects, including the risk of loss, injury, or death involving Landslides.

Construction of the Proposed Project would include minimal earth-moving activities. The project site has been previously developed and would be minimally graded, and limited soil would be excavated to construct foundations. Landslides have not been documented in the vicinity of the project site, and the project site is not within a Landslide Hazard Area (Sonoma County, 2016b; Sonoma County, 2021). The Proposed Project would be constructed over existing paved areas, and excavated soil would be disposed of on-reservation through balanced cut and fill that would not alter the overall flat topography of the project site and vicinity. The Proposed Project is not in an area with a risk for landslides and would not involve project components that would generate a risk of landslides.

There would be a less-than-significant impact.

Impact 4.5-5: The Proposed Project could result in substantial off-reservation soil erosion or the loss of topsoil.

As stated above, construction of the Proposed Project would include minimal earth-moving activities. The Proposed Project would be constructed over existing paved areas, and excavated soil would be disposed of on-reservation through balanced cut and fill. Earth-moving activities and excavation could create the potential for off-reservation erosion should soils be transported off-reservation by stormwater. Runoff would be collected in on-reservation detention basins and would not be discharged directly off-reservation. Two existing detention basins would be removed as part of the Proposed Project, however, potential runoff volumes of a 100-year storm event following construction would not exceed pre-project runoff volume (**Figure 3** and **Appendix D**).

Furthermore, prior to and during construction of the Proposed Project, the General Construction NPDES permit from the USEPA under federal requirements of the CWA will be complied with. Per the NPDES permit, a SWPPP shall be prepared and implemented prior to construction of the Proposed Project. The SWPP will contain applicable BMPs to reduce off-reservation impacts associated with stormwater runoff that could potentially affect off-reservation areas. BMPs listed in **Section 3.2.3** would be implemented, including preparation and adoption of a SWPPP with measures to protect against off-reservation runoff.

Mitigation Measure 4.4-1 would also be implemented to address potential impacts to off-reservation areas by installing protective silt fencing.

There would be a less-than-significant impact with mitigation.

4.5.4 MITIGATION MEASURES

None.

4.6 GREENHOUSE GAS EMISSIONS

This section addresses the greenhouse gas (GHG) emissions associated with the Proposed Project, evaluates potential off-reservation environmental impacts that may result from implementation of the Proposed Project, and presents mitigation measures, if necessary, to reduce potentially significant off-reservation impacts.

4.6.1 REGULATORY SETTING

Federal

National Environmental Policy Act

The National Environmental Policy Act (NEPA) directs federal agencies to assess the potential environmental impacts of their proposed major actions significantly affecting the human environment and inform the public about those potential impacts. The Council on Environmental Quality (CEQ) was established as part of NEPA to coordinate federal environmental efforts. On February 19, 2021, pursuant to federal Executive Order (EO) 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, the Council on Environmental Quality (CEQ) rescinded its 2019 *Draft National Environmental Policy Act* (NEPA) *Guidance on Consideration of Greenhouse Gas Emissions* and is reviewing, for revision and update, the 2016 *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. In the interim, EO 13990 directs agencies to consider all available tools and resources in assessing GHG emissions and climate change effects of their proposed actions, including the 2016 GHG Guidance. To assess impacts, the 2016 GHG Guidance states that federal agencies should quantify direct and indirect emissions of the project alternatives with the level of effort being proportionate to the scale of the emissions relevant to the NEPA review.

Additionally, 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.

Clean Air Act

On December 15, 2009, the USEPA issued a final endangerment and cause finding (74 FR 66496), stating that high atmospheric levels of GHGs "are the unambiguous result of human emissions, and are very likely the cause of the observed increase in average temperatures and other climatic changes." The USEPA further found that "atmospheric concentrations of greenhouse gases endanger public health and welfare within the meaning of Section 202 of the Clean Air Act." On December 20, 2021, EPA finalized federal greenhouse gas emissions standards for passenger cars and light trucks for Model Years (MY) 2023 through 2026.

State and Local

The Proposed Project is located on trust land and is therefore not subject to state or local laws and regulations concerning GHG emissions. However, such laws and regulations apply to off-reservation land in the vicinity of the Proposed Project, and GHG emissions from construction and operation of the Proposed Project would not be limited to the confines of trust land boundaries.

California Global Warming Solutions Act of 2006 (AB 32)

Signed by the California Governor on September 27, 2006, AB 32 codifies a key requirement of EO S-3-05, specifically the requirement to reduce GHG emissions in California to 1990 levels by 2020. Assembly Bill 32 tasks CARB with monitoring State sources of GHGs and designing emission reduction measures to comply with emission reduction requirements. However, AB 32 also continues the efforts of the CAT to meet the requirements of EO S-3-05 and states that the CAT should coordinate overall State climate policy.

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 it estimated could be implemented and would serve to meet about 25 percent of the required 2020 emissions reductions (CARB, 2007). 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 (CARB, 2007). In its October 2007 report, CARB cited the CAT strategies and other existing strategies that can be utilized to achieve the remainder of the emissions reductions (CARB, 2007). Assembly Bill 32 requires that CARB prepare a comprehensive "scoping plan" that identifies all strategies necessary to fully achieve the required 2020 emissions reductions. Consequently, in December 2008, CARB released its scoping plan to the public; the plan was approved by CARB on December 12, 2008. An update to the Climate Change Scoping Plan occurred on May 22, 2014, and included new strategies and recommendations to ensure reduction goals of near-term 2020 are met with consideration of current climate science.

A second update to the Climate Change Scoping Plan was adopted on December 14, 2017. The 2017 Scoping Plan Update addresses the 2030 target established by SB 32, as discussed below, and establishes a proposed framework of action for California to meet a 40 percent reduction in GHG by 2030 compared to 1990 levels. The key programs that the 2017 Scoping Plan Update builds on include the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, an increase in the use of renewable energy in the State, and a reduction of methane emissions from agricultural and other wastes (CARB, 2017).

The California Climate Crisis Act (AB 1279)

The California Climate Crisis Act (AB 1279) declares the State's policy to achieve net zero greenhouse gas emissions no later than 2045 and achieve and maintain net negative greenhouse gas emissions thereafter. The bill also ensures that by 2045, statewide anthropogenic greenhouse gas emissions will be reduced to at least 85% below the 1990 levels. The bill requires the State Board to work with relevant State agencies to ensure that updates to the CARB 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, as specified.

Building on~~ff~~ the success of the previous Plan's iterations, the 2022 CARB Scoping Plan lays out the sector-by-sector roadmap for California to achieve carbon neutrality by 2045 or earlier, outlining a technologically feasible, cost-effective, and equity-focused path to achieve the State's climate target.

Previous plans have focused on GHG reduction targets for our industrial, energy, and transportation sectors—first to meet 1990 levels by 2020, then to meet the more aggressive target of 40% below 1990 levels by 2030. The 2022 Scoping Plan extends and expands upon the earlier Plans with a target of reducing anthropogenic emissions to 85% below 1990 levels by 2045. The Plan outlines how carbon neutrality can be achieved by taking bold steps to reduce GHGs to meet the anthropogenic emissions target and by expanding actions to capture and store carbon through the State's natural and working lands and using a variety of mechanical approaches (CARB, 2022).

The major element of the 2022 Scoping Plan focuses on the aggressive reduction of fossil fuels wherever they are currently used in California. The main tenets of the Scoping Plan include 1) the electrification of vehicles, homes, and buildings; 2) stricter regulation of chemicals and refrigerants that potentiate climate change; 3) encouraging sustainable forms of public transportation, increased production of renewable energies and fuels; and 4) and promotion and expansion of healthy natural working lands (forests, shrublands/chaparral, croplands, wetlands, and other lands) (CARB, 2022).

Executive Order B-30-15 (EO B-30-15)

Executive Order B-30-15 was signed by the Governor on April 29, 2015. It sets interim GHG targets of 40 percent below 1990 by 2030, to ensure California will meet its 2050 targets set by AB 32. It also directs the CARB to update the Climate Change Scoping Plan.

Senate Bill 350 (SB 350)

Senate Bill 350 codifies the GHG targets for 2030 set by EO B-30-15. To meet these goals, SB 350 also raises the renewable portfolio standard from 33 percent renewable generation by 2020 to 50 percent renewable generation by December 31, 2030.

Senate Bills 350 and 32

Senate Bill (SB) 350 (2015) codified the GHG targets for 2030 set by EO B-30-15. To meet these goals, SB 350 also raised~~s~~ the renewable portfolio standard from 33 percent renewable generation by 2020 to 50 percent renewable generation by December 31, 2030. Passed by the California State Legislature in 2016, SB 32 codifies a GHG emissions reduction target of 40 percent below 1990 levels by 2030 and provides additional direction for developing Scoping Plan updates as described by the companion legislation, AB 197.

Bay Area Air Quality Management District

The Bay Area Air Quality Management (BAAQMD) is the responsible air district for regulating air quality in the portion of the SFBAAB surrounding the Project site. The BAAQMD has jurisdiction over all or portions of the nine counties in the Bay Area, including the southern portion of Sonoma County.

Bay Area Air Quality Management District 2017 Clean Air Plan

The BAAQMD 2017 Clean Air Plan focuses on two closely related goals, protecting public health and protecting the climate. Consistent with the GHG reduction targets adopted by the State of California, the Plan lays the groundwork for a long-term effort to reduce Bay Area GHG emissions by 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. The Plan offers a long-range vision of how the Bay Area could look and function in the year 2050 post-carbon economy and describes a comprehensive control strategy that the Air District will implement over the next three to five years to protect public health and protect the climate while setting the region on a pathway to achieve the 2050 vision.

The 2017 Plan updates the most recent Bay Area ozone plan, the 2010 Clean Air Plan, pursuant to air quality planning requirements defined in the California Health & Safety Code. To fulfill State ozone planning requirements, the 2017 control strategy includes all feasible measures to reduce emissions of ozone precursors—ROG and NOx—and reduce the transport of ozone and its precursors to neighboring air basins.

Sonoma County General Plan

The Sonoma County 2020 General Plan is the guiding document for development in the unincorporated areas of Sonoma County (County), which include a portion of off-reservation properties in the vicinity of the Proposed Project. The plan does not apply to the trust land on which the Proposed Project would be located, or to the Proposed Project itself. Policies in the plan that are relevant to off-reservation air quality conditions in the vicinity of the project site are included in the Open Space and Resource Conservation Element.

Sonoma County Climate Action Plan

The County adopted the Regional Climate Protection Authority's (RCPA) Climate Action Plan (CAP) in 2016 as an implementation measure of the Sonoma County 2020 General Plan. Although the CAP was not upheld in court following litigation, and the certification of the CAP's EIR was rescinded on November 13, 2017, the RCPA backs the research and GHG reduction strategies developed in the CAP for planning purposes.

Sonoma County Five-Year Strategic Plan 2021-2026: Climate Action and Resiliency

Sonoma County's Five-Year Strategic Plan provides context to inform policies and projects that are prioritized over the span of 2021 to 2026. Specifically, the Plan's Climate Action and Resiliency portion focuses on countywide mobilization efforts toward mitigating and preventing climate change through strategies involving preparedness, adaptation, and resiliency. Air Quality and GHG Goals adopted by the Strategic Plan include the following:

Climate Action and Resiliency Goals

Goal 1: Continue to invest in wildfire preparedness and resiliency strategies
Goal 2: Invest in the community to enhance resiliency and become carbon neutral by 2030
Goal 3: Make all County facilities carbon-free, zero waste, and resilient
Goal 4: Maximize sustainability and emissions reductions in all County Fleet vehicles
Goal 5: Maximize opportunities for mitigation of climate change and adaptation through land conservation work and land use policies

Sonoma County Climate Resilient Lands Strategy

In September 2022, the County's Board of Supervisors approved the Climate Resilient Lands Strategy to provide structure and guidance to climate-related efforts throughout the County. This non-regulatory strategy document identifies the highest priority projects to build resilience across the varied land types and promote system-wide benefits to the County's watersheds and ecosystems. By supporting adaptation in the County's natural and working lands to adjust to the changing climate, the strategy mitigates the impacts of climate hazards. Some air quality and GHG goals and objectives of the strategy include:

- Focusing early actions on areas with the greatest potential for carbon sequestration, climate risk reduction, and biodiversity enhancement.

- Providing a forum for coordinated action on climate resilience in the County.
- Partnering with Native American tribes within Sonoma County to advance traditional ecological knowledge and preserve tribal cultural resources and tribal cultural properties.
- Identifying funding and financing strategies within the County, State, and federal, as well as private funding sources to advance this Plan.
- Prioritizing equity and climate justice approaches that are measurable and clear.

City of Rohnert Park 2040 General Plan

The Rohnert Park 2040 General Plan Draft is a long-range plan that guides decision-making and establishes rules and standards for development and City improvements, including those related to climate change. Chapter 6, Climate Change Elmenet, of the City's General identifies the sources of GHGs in the City and seeks to lay out specific strategies for mitigating and adapting to climate change impacts for the City. It contains an inventory of greenhouse gas emissions from 2010 and 2015, expected climate-related changes to natural hazards throughout the life of the General Plan, and climate adaptation strategies to mitigate these changes.

4.6.2 ENVIRONMENTAL SETTING

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. As defined in California Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, discussed in detail below, GHGs include all of the following: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) (Health & Safety Code §38505[g]). The greenhouse effect is the process of solar radiation entering the earth's atmosphere from space; a portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. The absorbed radiation is then emitted from the earth, not as high-frequency solar radiation, but lower-frequency infrared radiation. Most solar radiation passes through GHGs; however, infrared radiation is selectively absorbed by GHGs. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on Earth.

In addition to natural sources, human activities are exerting a substantial and growing influence on climate by changing the composition of the atmosphere and by modifying the land surface through deforestation and urbanization reducing carbon capture and decreasing albedo (light reflection) (IPCC, 2007). 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, and agricultural sectors (USEPA, 2020). 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 world's ocean.

Global warming potential (GWP) is a measure of how much a given mass of GHG is estimated to contribute to global warming. It is a relative scale, which compares the gas in question to that of the same mass of CO_2 (which has a GWP of 1). Thus, for example, CH_4 has a GWP of 21 and N_2O has a GWP of 310 (USEPA, 2022). Consequently, using each pollutant's GWP, emissions of CO_2, CH_4, N_2O, CFCs and ozone depleting CFCs, and HFCs can be converted into CO_2 equivalents (CO_2e).

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme. The IPCC's mission is to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, including the potential impacts and options for adaptation and mitigation. -It is anticipated that the average global temperature could rise 1.5 degrees Celsius (º C) (2.7 degrees Fahrenheit [º F]) to 4.0º C (7.2º F) between the years 2000 and 2100 (IPCC, 2013).

Fossil fuel combustion removes carbon stored underground (as, for example, coal, oil, or natural gas) and releases it into the active carbon cycle, thus increasing concentration of GHGs in the atmosphere. The IPCC Fifth Assessment Report (IPCC Report) concludes emissions of GHGs in excess of natural ambient concentrations are extremely likely (defined as 95 to 100 percent confidence) to be responsible for the enhancement of the greenhouse effect and contribute to what is termed "global warming," a trend of unnatural warming of the Earth's climate. Increases in these gases lead to more absorption of radiation and warm the lower atmosphere further, thereby increasing evaporation rates, and temperatures near the surface. Climate change is a global problem and GHGs are global pollutants, unlike criteria air pollutants (such as ozone, carbon monoxide, and particulate matter) and toxic air contaminants, which are pollutants of regional and local concern.

The IPCC Report incorporates findings of the current effects of global climate change. The IPCC Report further concludes that an enhanced greenhouse effect will generate new patterns of microclimate and will have significant impacts on economies, the environment, and transportation infrastructure and operations due to increased temperatures, intensity of storms, sea level rise, and changes in precipitation. Impacts may include flooding of tunnels, coastal highways, runways, and railways, buckling of highways and railroad tracks, submersion of dock facilities, and a shift in agriculture to areas that are now cooler. Such prospects will have strategic security as well as transportation implications.

The IPCC Report also notes that climate change also affects public health and the environment. Increased smog and emissions, respiratory disease, reduction in the water supply, extensive coastal damage, and changes in vegetation and crop patterns have been identified as effects of climate change. The impacts of climate change are broad-ranging and interact with other market failures and economic dynamics, giving rise to many complex policy problems.

Emission Sources

California is a diverse state with many sources of GHG emissions. Sources are subdivided into four major emission categories: energy, mobile, water transport, and solid waste disposal. Energy sources are the consumptive use of electricity and natural gas. The amount of CO_2e depends on the proportion of renewable energy generated by the power provider. Mobile sources are generated from both on and off-road vehicles. Emissions from water transport are generated from the energy demands of serving water and are affected by both the renewable mix of the power provider and the service delivery distance. Emissions from solid waste disposal are comprised of landfill biogas, composting, and land treatment.

4.6.3 IMPACT ANALYSIS

The following criteria are established by the Off-reservation Environmental Impact Analysis Checklist (**Appendix A**) and have been used in this section to evaluate potential off-reservation environmental impacts of the Proposed Project related to GHGs. Such impacts are considered significant if they would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the off-reservation environment; or
- Conflict with any off-reservation plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Development of the Proposed Project would result in an increase in GHG emissions related to mobile sources (trips generated), area sources (components of the project that directly emit GHGs), and indirect sources related to electrical power generation. On February 19, 2021, pursuant to federal Executive Order (EO) 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, the Council on Environmental Quality (CEQ) rescinded its 2019 *Draft National Environmental Policy Act* (NEPA) *Guidance on Consideration of Greenhouse Gas Emissions* and is reviewing, for revision and update, the 2016 *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. In the interim, EO 13990 directs agencies to consider all available tools and resources in assessing GHG emissions and climate change effects of their proposed actions, including the 2016 GHG Guidance.

To assess impacts, the 2016 GHG Guidance states that federal agencies should quantify direct and indirect emissions of the project alternatives with the level of effort being proportionate to the scale of the emissions relevant to the NEPA review. The CEQ guidance advises federal lead agencies to consider the following:

1. The potential effects of a proposed action on climate change as indicated by assessing GHG emissions, and
2. The effects of climate change on a proposed action and its environmental impacts.

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. Additionally, 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.

While federal guidance has not adopted a quantitative GHG threshold of significance, regional GHG emission standards have been adopted by BAAQMD. In addition, local and statewide goals and policies related to GHG emissions have been adopted. Because GHG emissions are not constrained to trust land, this analysis ~~includes a quantification of GHG emissions resulting from the Proposed Project and a discussion~~ compares Proposed Project GHG emissions to BAAQMD emission thresholds and discusses how the Proposed Project would comply with relevant ~~of how applicable measures can reduce~~ GHG emission policies~~s and similarly reduce climate impact on disadvantaged communities~~. GHG emissions ~~that are a direct result of~~directly resulting from the Proposed Project were estimated using the CalEEMod (**Appendix F**). Equipment use, energy use, and mobile sources were estimated for the Proposed Project.

Impact 4.6-1: The Proposed Project could generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the off-reservation environment.

As previously discussed, the four major emission categories include energy production, mobile emissions, water transport and usage, and solid waste disposal. Operation of the Proposed Project would result in direct and indirect emissions of CO_2e. Direct sources include consumer product use, architectural coatings, landscape maintenance equipment, and on-site boiler and generator usage. Indirect emission sources include energy production, mobile emissions, solid waste generation, and water and wastewater transport and treatment. ~~GHG emissions resulting from the Proposed Project are primarily indirect (indirect mobile emissions from delivery, patron, and employee vehicles). The federal government has enacted measures that would reduce GHG emissions from mobile sources, some of which have been accounted for in the air quality model used to estimate mobile emissions. Consistent with the 2016 CEQ Guidance and SO 3399, BMPs have been provided in **Section 3.2.3** to reduce project-related GHG emissions, such as reducing the idling of heavy equipment and thus CO_2 emissions. Operational BMPs would reduce indirect GHG emissions from electricity use, water and wastewater transport, and waste transport through the installation of additional rooftop solar arrays, energy efficient lighting, heating and cooling systems, low-flow appliances, drought resistant landscaping, and recycling receptacles. Operational BMPs would also reduce indirect mobile GHG emissions by requiring adequate ingress and egress to minimize vehicle idling and preferential parking for vanpools and carpools to reduce project-related trips.~~

TABLE 4.6-1
PROPOSED PROJECT UNMITIGATED GHG EMISSIONS

Source	MT of CO_2e/year
Construction	25
Area	0.10
Energy	1,755
Mobile	~~6,115~~5,713
Waste	74
Water	86
Total	**~~8,055~~7,653**
Annual Emission Threshold	**1,100**
Threshold Exceeded	**Yes**

NOTES: MT = metric tons;
Construction emissions are amortized over a 30-year period.
SOURCE: **Appendix F**

Direct and indirect GHG emissions ~~are not substantial; however, project-related GHG emissions~~ have been ~~quantified~~ provided in (**Table 4.6-1**). Quantified emission sources are provided in **Appendix F**.

As shown above, the Proposed Project would emit approximately 7,653 MT of CO_2e during its first year of operation. Proposed Project emissions are primarily indirect (indirect mobile emissions from delivery, patron, and employee vehicles).

The federal government has enacted efficiency measures that would reduce GHG emissions from mobile sources, some of which have been accounted for in the air quality model used to estimate mobile emissions. Mitigation measure **4.3-1** and BMPs in **Section 3.2.3** would be implemented to reduce project-related GHG emissions.

~~and will be reduced with the implementation of BMPs provided in **Section 3.2.3**. This approach is consistent with the 2016 CEQ Guidance, which directs agencies to quantify direct and indirect emissions of project alternatives and to consider GHG reduction measures that are reasonable and consistent with achieving the purpose and need for the proposed action. Additionally, the implementation of project BMPs, such as using clean fuel vehicles, installing rooftop solar arrays and energy efficient appliances, and promoting waste reduction, is consistent with the intent of SO 3399 to reduce GHG emissions and contribute to the global effort to reduce climate change impacts on disadvantaged communities. The effects of climate change are most effectively addressed on a global or regional level. California's CARB Updated 2020 Scoping Plan (Scoping Plan) is intended to be a regional approach, implemented by the State of California to ensure that statewide emissions are reduced substantially in the future.~~

~~Most of these measures focus on statewide action meant to curb emissions by changes in statewide planning or policies rather than changes to individual development projects. However, some of the measures may be directly applicable to specific industries or individual commercial developments. Should a development alternative comply with directly applicable measures, the alternative would support the State's efforts to significantly reduce its cumulative contribution to global climate change and the associated impacts.~~

~~The Proposed Project would comply with the strategies currently identified by California to comply with the Scoping Plan, although these strategies are not applicable on trust land. Relevant strategies include regulating vehicle emissions, reducing waste, and reducing energy and water consumption. The BMPs provided in **Section 3.2.3** are consistent with these state strategies and with those recommended by the 2016 CEQ Guidance and SO 3399. These strategies would include measures such as: using clean fuel vehicles, implementing low-flow appliances and water reuse, installing rooftop solar arrays and energy efficient lighting and appliances, and promoting waste reduction and diversion. Therefore, implementation of the Proposed Project would have a less than significant cumulative adverse effects associated with climate change.~~

There would be a less-than-significant impact.

Impact 4.6-2: The Proposed Project could conflict with any off-reservation plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

BMPs and Mitigation Measure 4.3-1 of the Proposed Project would generally comply with the strategies identified by the Clean Air Plan and Scoping Plan. The Tribe currently purchases electricity from Sonoma Clean Power, which derives most of its energy from clean sources and generates 2.4 megawatts of electricity through existing rooftop solar arrays. The Tribe also offers an extensive bus service to carry patrons to and from the existing Resort to the Bay Area, including San Francisco, Daly City, San Jose, and Milpitas. Approximately 36 buses run daily from the Resort to the Bay Area, reducing cumulative VMT to and from the Project site. Therefore, implementation of the Proposed Project would have less than significant cumulative adverse effects associated with climate change.

~~The immediate off-reservation areas in the County and the City are not governed by adopted CAPs, however all off-reservation land is subject to the CARB Updated 2020 Scoping Plan (Scoping Plan). The Proposed Project would comply with the strategies currently identified by California to comply with the Scoping Plan, although these strategies are not applicable on federal trust land. Therefore, implementation of the project alternatives would have a less than significant cumulative adverse effects associated with climate change.~~

There would be a less-than-significant impact.

4.6.4 MITIGATION MEASURES

None.

4.7 HAZARDS AND HAZARDOUS MATERIALS

This section addresses the off-reservation environment associated with hazards and hazardous materials, analyzes potential off-reservation impacts of the Proposed Project, and presents mitigation measures, if necessary, to reduce any identified off-reservation impacts.

4.7.1 REGULATORY SETTING

Federal

Resource Conservation and Recovery Act

The USEPA regulates the disposal of certain hazardous materials through the Resource Conservation and Recovery Act (RCRA). The RCRA authorizes the USEPA to control hazardous waste from generation to disposal, and provides a framework for managing non-hazardous wastes. The 1984 amendments to RCRA, known as the "Federal Hazardous and Solid Waste Amendments," require phasing out land disposal of hazardous waste. As amended in 1986, RCRA addresses potential problems associated with underground tanks storing petroleum and other hazardous substances.

Under RCRA, the USEPA regulates the activities of hazardous waste generators, transporters, and handlers (any individual who treats, stores, and/or disposes of a designated hazardous waste). RCRA further requires the tracking of hazardous waste from its generation to its final disposal through a process often referred to as the "cradle-to-grave" regulation. The cradle-to-grave regulation requires detailed documentation and record keeping for hazardous waste generators, transporters, and/or handlers in order to ensure proper accountability for violations of applicable regulations. Hazardous waste generators are divided into three categories of generators based upon hazardous waste generation rates: Conditionally Exempt Small Quantity Generators, Small Quantity Generators, and Large Quantity Generators. Each type of generator is subject to different regulations due to differences in the amount of hazardous waste generated.

Toxic Substances Control Act

The Toxic Substances Control Act of 1976 (TSCA) provides the USEPA with authority to implement reporting, record-keeping, testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances such as food, drugs, cosmetics, and pesticides are generally excluded from TSCA. TSCA addresses the production, importation, use, and disposal of specific chemicals, including polychlorinated biphenyls, asbestos, radon, and lead-based paint.

Comprehensive Environmental Response Compensation and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, imposed a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases (or threatened releases) of hazardous substances that may endanger public health or the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous substance sites, provided for liability of persons responsible for releases of hazardous substances at these sites, and established a trust fund to provide for cleanup of these sites when no responsible party could be identified. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986 in order to increase the size of the trust fund, provide for additional enforcement tools, emphasize the preference for permanent cleanup actions, and consider updated state and federal standards.

Clean Water Act

The Clean Water Act (CWA; 33 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 United States Environmental Protection Agency (USEPA) is delegated as the administrative agency under the CWA.

Anti-degradation Policy

Federal policy (Code of Federal Regulations [CFR], Title 40, Part 131.6) 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.

Safe Drinking Water Act

Minimum national drinking water standards are established through the 1974 Safe Drinking Water Act (amended in 1986 and 1996). Guidelines for groundwater protection are also issued through this act. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. The USEPA regulates these types of contaminants through the development of national primary and secondary Maximum Contaminant Levels for drinking water.

State and Local

The project site is located on trust land, and is therefore not subject to the following state or local laws and regulations concerning hazardous materials. However, such laws and regulations apply to off-reservation land in the vicinity of the project site.

California Code of Regulations, Title 22

This section of the CCR, commonly referred to as "Title 22," is a broad set of regulations dealing with social issues. Title 22 Divisions 4 and 4.5 address off-reservation environmental and public health issues such as hazardous waste, medical waste, and the protection of drinking water.

California Environmental Protection Agency

The California Environmental Protection Agency (CalEPA) was created in 1991 to better coordinate state environmental programs, reduce administrative duplication, and address the most significant off-reservation environmental and health risks. CalEPA oversees the following agencies: California Air Resources Board, California Integrated Waste Management Board, Department of Pesticide Regulation, State Water Resources Control Board, the California Department of Toxic Substances Control (DTSC), and the Office of Emergency Services. DTSC regulates the off-reservation generation, transportation, treatment, storage, and disposal of hazardous waste under RCRA and the State Hazardous Waste Control Law. Both laws impose cradle-to-grave regulatory systems for handling hazardous waste in a manner that protects human health and the environment.

California Health and Safety Code

Division 20, Chapter 6.95 of the California Health and Safety Code requires off-reservation businesses that generate, store, or transport hazardous materials to prepare and maintain a Hazardous Materials Business Plan (HMBP). The DTSC delegates enforcement of the HMBP to local environmental health departments.

Hazardous Waste Control Act

The Hazardous Waste Control Act (HWCA) of 1972 established the basis for the California Hazardous Waste Control Program within the California Department of Public Health. Included in the HWCA are definitions for what is considered to be a "hazardous waste," the definition of "hazardous," and what is required for appropriate handling, processing, and disposal of hazardous and extremely hazardous waste in areas over which the state has jurisdiction in a manner that protects the public, livestock, and wildlife. The HWCA also established a tracking system for the off-reservation handling and transportation of hazardous waste from the point of waste generation to the point of ultimate disposition, as well as a system of fees to cover the costs of operating the hazardous waste management program. The HWCA is California's implementation of the RCRA cradle to grave tracking requirement. The USEPA used several components of the HWCA when CERCLA was first introduced in 1980. The primary State entity that oversees the cradle-to-grave regulations is the DTSC.

4.7.2 ENVIRONMENTAL SETTING

Operation of the Resort involves a minimal amount of hazardous materials and the generation of wastewater. Potentially hazardous materials that may be used and stored at the Resort for maintenance purposes include paints, polishes, cleaning products, oils, and automotive products. As stated in the 2012 National Indian Gaming Commission Final Environmental Impact Statement (NIGC FEIS), the Resort is compliant with federal regulations related to hazardous materials. The Tribe developed a Hazardous Materials Management Plan (HMMP) prior to construction of the Resort in compliance with Hazardous Materials Mitigation Measure Q in the NIGC FEIS. The Resort's existing water supply system includes two water supply wells, a water treatment plant (WTP), a water storage tank, and a water distribution pump system. These facilities are located on-reservation. The WTP removes iron and manganese and includes a disinfection system in compliance with USEPA standards and the Federal Safe Drinking Water Act. Wastewater from the Resort is disposed of into the regional sewer system.

4.7.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by the Off-reservation Environmental Impact Analysis Checklist (**Appendix A**) and have been used in this section to evaluate potential off-reservation environmental impacts of the Proposed Project with respect to hazards and hazardous materials. Such impacts are considered significant if they would:

- Create a significant hazard to the off-reservation public or the off-reservation environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the off-reservation public or the off-reservation environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 miles of an existing or proposed off-reservation school; or

- Expose off-reservation people or structures to a significant risk of loss, injury, or death involving wildland fires.

The off-reservation impact assessment was based on a review of the existing Resort's operation, the Proposed Project's construction and operational hazardous materials needs, the relevant regulatory context, and the significance criteria presented above.

Impact 4.7-1: The Proposed Project could create a significant hazard to the off-reservation public or the off-reservation environment through the routine transport, use, or disposal of hazardous materials.

Construction

During construction of the Proposed Project, limited quantities of potentially hazardous substances common to construction sites such as fuels, solvents, oils, and paints would be used. Construction could rely on the use of storage sheds and utility buildings for storing hazardous materials, and may involve servicing vehicles for fueling purposes. If properly used, stored, and disposed of, such materials would not be a hazard to the off-reservation public and environment. Additionally, implementation of BMPs listed in **Section 3.2.3** would decrease off-reservation impacts associated with the storage and use of hazardous materials during construction. The Hazardous Materials Business Plan detailed in **Section 3.2.3** would ensure that if large quantities of common hazardous materials are necessary, they would be handled in accordance with state law, even on trust land. Furthermore, the SWPPP would contain BMPs to ensure that runoff is properly collected and treated throughout construction.

There would be a less-than-significant impact.

Operation

The routine transport, use, or disposal of hazardous materials associated with operation of the Proposed Project would be limited to common substances used in routine maintenance of the Resort, such as paint and commercial cleaners. These substances would be handled in accordance with manufacturer specifications and in compliance with the Tribe's HMMP, which limits the materials to the minimum quantity needed and the least hazardous option. Use of such limited quantities of common materials would not affect the off-reservation public and environment.

There would be no impact.

Impact 4.7-2: The Proposed Project could create a hazard to the off-reservation public or the off-reservation environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

Construction

Hazardous materials discussed in **Impact 4.7-1** would be used during construction of the Proposed Project. The following standard operating procedures will be implemented, as recommended by the HMMP, and would reduce potential impacts:

1. To reduce the potential for accidental releases, fuel, oil, and hydraulic fluids shall be transferred directly from a service truck to construction equipment and shall not otherwise be stored on the project site. Paint, thinner, solvents, cleaners, sealants, and lubricants used during construction shall be stored in a locked utility building, handled per the manufacturers' directions, and replenished as needed.
2. In the event that contaminated soil and/or groundwater or other hazardous materials are encountered during construction-related earth-moving activities, all work shall be halted until a qualified individual can assess the extent of contamination. If contamination is determined to be significant, representatives of the Tribe shall consult with the USEPA to determine the appropriate course of action, including the development of a sampling plan and remediation plan if necessary.
3. The amount of hazardous materials used in construction and operation shall be kept at the lowest required volumes.
4. The least toxic material capable of achieving the intended result shall be used to the extent practicable. Non-toxic alternatives shall include garden care products and organic non-toxic cleaners when feasible.
5. Personnel shall follow written standard operating procedures for filling and servicing construction equipment and vehicles.

The SWPPP described in **Section 3.2.3** would ensure that runoff is properly collected and treated throughout construction.

There would be a less-than-significant impact.

Operation

As discussed under **Impact 4.7-1**, the amount and types of hazardous materials that would be stored, used, and generated during operation of the Proposed Project would not pose a significant hazard to the off-reservation public and environment if an accidental spill or release were to occur.

There would be no impact.

Impact 4.7-3: The Proposed Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed off-reservation school.

There are no schools within one quarter mile of the project site. The nearest off-reservation school is Pathways Charter School, which is located approximately 0.75 miles southeast of the project site. Implementation of the Proposed Project would not result in off-reservation hazardous emissions or off-reservation handling of hazardous materials. The distance from the Proposed Project to the nearest off-reservation school is greater than 0.25 miles, and no significant off-reservation hazardous emissions or off-reservation handling of hazardous materials are anticipated as a result of the Proposed Project.

There would be a less-than-significant impact.

Impact 4.7-4: The Proposed Project could expose off-reservation people or structures to a significant risk of loss, injury or death involving wildland fires.

Construction

Equipment used during construction could create sparks or flames, however the project site is currently paved and is surrounded by urbanized land. BMPs to reduce fire hazards during construction are included in **Section 3.2.3**. Therefore, the risk of sparks or flames igniting vegetation leading to off-reservation wildfires is minimal.

There would be a less-than-significant impact.

Operation

The Proposed Project will adhere to applicable codes in Section 6.4.2 of the Compact, comparable to the California Building and Public Safety Codes (Compact, 2012). The Tribe would continue to take necessary steps to reasonably ensure the ongoing availability of sufficient and qualified fire suppression services. Applicable fire protection features would be incorporated into the design via BMPs listed in **Section 3.2.3**. In addition, the Tribe has existing agreements with the City and County that address fire services to the reservation. The Tribe will coordinate with the City and County to update existing agreements to account for the Proposed Project and to ensure off-reservation response times are not affected, as further discussed in **Section 4.12**. These agreements will apply to operation of the Proposed Project. In addition, the BIA has an agreement with CalFire to compensate the State for providing fire response services to trust land in California. These measures and agreements would reduce the risk of a large structural fire on the Reservation spreading to off-reservation wildland areas.

There would be a less-than-significant impact.

4.7.4 MITIGATION MEASURES

None.

4.8 WATER RESOURCES

This section addresses the water resources setting of the project site and surrounding region, evaluates potential off-reservation environmental impacts on water resources that may result from implementation of the Proposed Project, and presents mitigation measures, if necessary, to reduce identified off-reservation impacts to water resources, hydrology, and water quality. A Water and Wastewater Study for the Proposed Project is included as **Appendix E**.

4.8.1 REGULATORY SETTING

Federal

Clean Water Act

The Clean Water Act (CWA; 33 USC §1251-1376), as amended by the Water Quality Act of 1987, is the primary 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 United States Environmental Protection Agency (USEPA) is delegated as the administrative agency under the CWA. Relevant sections of the CWA include Sections 303 and 304, Section 401, Section 402, and Section 404.

Anti-degradation Policy

Federal policy (Code of Federal Regulations [CFR], Title 40, Part 131.6) specifies that each state must develop, adopt, and retain an anti-degradation policy to protect the minimum level of surface water quality necessary to support existing uses. 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.

Safe Drinking Water Act

Minimum national drinking water standards and guidelines for groundwater protection are established through the 1974 Safe Drinking Water Act (amended in 1986 and 1996). Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. The USEPA regulates contaminants through the development of national primary and secondary Maximum Contaminant Levels for drinking water.

Disaster Relief Act

The Disaster Relief Act of 1974 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. FEMA allows non-residential development in a floodplain; however, construction activities are restricted within the flood hazard areas, depending upon the potential for flooding within each area.

NPDES Permitting Program

Facilities discharging pollutants from point-sources into waters of the United States must obtain a discharge permit under the National Pollutant Discharge Elimination System (NPDES) program. The USEPA must consider the status of the regional water quality before issuing an individual facility NPDES permit for discharge to impaired waterways.

Construction projects disturbing one or more acres of soil must be covered under the NPDES general permitting process. The USEPA's Stormwater General NPDES Permit for Construction Activities also requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP).

State and Local

The Proposed Project is located on trust land and is not subject to State or local laws and regulations concerning water resources. However, such laws and regulations apply to off-reservation land in the immediate vicinity of the project site.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code [Water Code]) provides the basis for surface water and groundwater quality regulation within California. This act established the authority of the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The Porter Cologne Act (§13242) requires that a TMDL program of implementation be developed in the Regional Water Quality Control Plans for water bodies listed under Section 303 of the CWA that describes how water quality objectives will be attained.

RWQCB's Anti-degradation Policy

The Porter-Cologne Act requires the State to designate beneficial uses of surface water and groundwater, and to specify water quality objectives designed to protect those uses. These water quality objectives are presented in the *Regional Water Quality Control Plans* (basin plans). Basin plans are developed and periodically reviewed to fulfill the State's requirements of the anti-degradation policy of the CWA. Each basin plan provides a technical basis for determining WDRs and regulatory enforcement action. The project site is within the North Coast Region.

California Water Code

The California Water Code designates the California Department of Public Health (CDPH) as the lead agency responsible for developing uniform statewide recycling criteria for each type of use of treated wastewater for the protection of public health. The CDPH and the RWQCBs are directed under the Water Code to regulate treated wastewater production and use. The CDPH has jurisdiction over the production of treated wastewater and the enforcement of California Code of Regulations (CCR) Title 22 for treated wastewater criteria. The RWQCB is responsible for issuing treated wastewater use requirements.

California Code of Regulations, Title 22

Title 22 Divisions 4 and 4.5 address environmental and public health issues such as hazardous waste, medical waste, and the protection of drinking water. Division 4 Chapter 3 of Title 22 establishes the acceptable uses of treated wastewater, wastewater treatment requirements for each use, use area requirements, engineering report requirements, reporting and record keeping requirements, and design requirements for operational reliability of treatment for generators and users of recycled water under state jurisdiction. These regulations establish acceptable levels of constituents in treated wastewater for a range of uses, and prescribe means for assurance of reliability in the production of treated wastewater. Criteria for the production of treated wastewater include water quality standards, treatment process requirements, operational requirements, and treatment reliability requirements. The intent of these regulations is to ensure the protection of public health associated with the use of treated wastewater.

Sustainable Groundwater Management Act

The intent of the Sustainable Groundwater Management Act ([SGMA]; Water Code § 10720 et seq.) is to "halt overdraft and bring groundwater basins into balanced levels of pumping and recharge." 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).

Sonoma County General Plan

The Water Resources Element of the Sonoma County General Plan includes goals, policies, and implementation actions to conserve and protect water resources and water quality. Section 2 discusses water rights regulations, hydrologic systems, major streams and drainage basins, the role of vegetation in the water cycle, and natural underground water storage. Section 3 discusses the County's goals, objectives, and policies related to water resources. Implementation programs are described in Section 4.

Rohnert Park California Municipal Code

Title 13 of the Rohnert Park Municipal Code defines water and sewer usage regulations for the City and establishes stormwater discharge of the City. Chapters 13.08 through 13.52 are specific to sewer usage, and include provisions for control of sewer construction, source control of toxic substances, and the monitoring and control of the quality and quantity of industrial wastes. Chapter 13.64 is specific to stormwater discharge, and includes provisions to protect and enhance water quality of water bodies consistent with the Federal Clean Water Act (33 U.S.C. § 1251 et seq.) and National Pollutant Discharge Elimination System (NPDES) Phase II stormwater regulations for small municipal storm sewer systems.

City of Rohnert Park General Plan, NWSP, and WDSP

The Rohnert Park General Plan 2020 is the guiding document for development within the City limits and Sphere of Influence of the City of Rohnert Park, which includes a portion of the off-reservation vicinity of the Proposed Project. The Rohnert Park General Plan is a document required by State law and adopted by the City Council that is a comprehensive, long-term plan for the physical development and growth of the City. The Northwest Specific Plan area is immediately east of the Graton Resort and Casino. The Northwest Specific Plan provides development standards that regulate new development concerning height, building setbacks, parking requirements, and other development features.

4.8.2 ENVIRONMENTAL SETTING

The project site is located in the upper Laguna de Santa Rosa watershed within the Santa Rosa Valley Basin (Basin)(**Appendix E**; USEPA, 2022a). The Basin consists of three sub-basins: the Santa Rosa Plain Sub-Basin, the Healdsburg Area Sub-Basin, and the Rincon Valley Sub-Basin. The project site is located in the Santa Rosa Plain Sub-Basin (Sub-Basin). Average annual rainfall for Santa Rosa measured between 1930 to 2020 is 29.8 inches (**Appendix E**). An estimated 4,000 to 5,000 groundwater wells pump from the Sub-Basin, including agricultural wells, municipal wells, and rural domestic wells.

Groundwater

Under federal and State law, the Tribe is entitled to beneficially use groundwater on the reservation.
Groundwater levels and flow directions in the Sub-Basin have changed significantly since the 1950s due to aggressive groundwater extraction, followed by a significant reduction in extraction beginning in the early 2000's.

Six hydrogeologic units occur in the vicinity of the project site: Quaternary Alluvial Deposits, Glen Ellen Formation, Wilson Grove Formation, Petaluma Formation, Sonoma Volcanics, and Basement Rocks, described in detail within Section 7.1.2 of **Appendix E**. Shallower aquifers within the Sub-basin support wells with a depth of less than 200 feet, while the deeper aquifers within the basin require well drilling of depths exceeding 2,000 feet.

As discussed within Section 7.1.3 of **Appendix E**, the Santa Rosa Plain Hydrologic Model identifies current and projected groundwater conditions within the Santa Rosa Plain. Between 2012 and 2018, major sources of groundwater recharge in the Santa Rosa Plain were stream seepage to groundwater (14,900 acre-feet per year (AFY)), net subsurface inflow (4,700 AFY), deep percolation of precipitation and applied water (25,200 AFY), and septic return flows (1,200 AFY). Outflows from the groundwater basins include groundwater discharge to streams (-13,700 AFY), evapotranspiration and surface leakage of groundwater (-14,700 AFY), and groundwater pumping (-19,900 AFY). There is a current loss of approximately 1,200 AFY of groundwater, with a projected future loss for 2021-2070 of 200 to 1,400 AFY ranging from a wet climate change scenario to an extended drought scenario (**Appendix E**).

Surface Water

Several streams, drainages, and wetlands are located in the surrounding vicinity of the project site. The Bellevue-Wilfred Channel contains gently flowing water year-round and drains into the Laguna de Santa Rosa (Huffman-Broadway, 2006). The Laguna de Santa Rosa consists of several creeks, including Hinebaugh Creek and Copeland Creek shown in **Figure 7**. The Laguna de Santa Rosa is the Russian River's largest tributary and one of the larger freshwater wetlands in northern California (Sonoma Land Trust and Laguna de Santa Rosa Foundation, 2003). Several other creeks, including Labath Creek, drain into the Laguna de Santa Rosa. Labath Creek is a small, intermittent, linear channel modified for flood control between Labath Avenue and Business Park Drive. The Bellevue-Wilfred Channel, and the Laguna de Santa Rosa are classified by the County and the City as flood control channels and are managed by Sonoma Water (NMFS, 2008). Isolated wetlands have been previously identified on the reservation and reservation borders, as shown in **Figure 8**.

Drainage

The general drainage pattern on the project site flows in a southwesterly direction towards the Laguna de Santa Rosa. The Bellevue-Wilfred Channel bisects the southwestern portion of the reservation from north to south, and is a man-made flood control channel that drains into the Laguna de Santa Rosa just south of the reservation (Huffman-Broadway, 2006). The Laguna de Santa Rosa flows in a southwesterly direction prior to discharge into the Russian River. Stormwater from the existing Resort and parking lots drains into previously engineered bioswales then into one of the retention basins on-reservation. As currently designed, the bioswales and retention basins can hold a maximum of 14 af of stormwater, which can then be metered into Labath Creek. A portion of the southwest area of the reservation is within a 100-year floodplain, however no structures or buildings are located in this area.

Water Quality

In compliance with the CWA, the North Coast RWQCB (NCRWQB) has established water quality objectives for all inland surface waters in its jurisdiction. The Laguna de Santa Rosa is currently on the list of CWA 303(d) impaired waterbodies. The NCRWQCB has placed limitations on the discharge of treated wastewater into the Laguna de Santa Rosa by the Santa Rosa Sub-Regional Wastewater Treatment Plant (WWTP) based on flows of the Russian River. Quality of potable water provided on the reservation is maintained by an on-reservation water treatment plant.

Private well owners are responsible for treating groundwater produced by their wells, if necessary. Sonoma Water, which supplies municipal water within the County, acquires water from surface water sources and maintains quality of water through river bank filtration, chlorination, and pH adjustment (Sonoma Water, 2022).

Monitoring

In accordance with the Record of Decision (ROD) that approved the existing Resort, the Tribe was required to monitor groundwater elevations on and in the vicinity of the reservation. A monitoring plan was developed and implemented to comply with the ROD and in accordance with the Intergovernmental Agreement (IGA) between the Tribe and the County. Monitoring was designed to determine an initial baseline water level and potential groundwater impacts of the Resort to off-reservation surrounding wells. To date no significant impacts to off-reservation wells have been identified.

Water Supply

Existing water supply facilities are discussed in detail in Section 3.1 and 3.2 of **Appendix E**. The Resort's existing water supply system includes two water supply wells (Well 1 and Well 2), a water treatment plant (WTP), a water storage tank, and a water distribution pump system. These facilities are located on-reservation. Well 1 has a depth of 650 feet and an estimated yield of 720,000 gallons per day (gpd), or 500 gallons per minute (gpm). Well 2 has a depth of 680 feet and an estimated yield of 547,000 gpd, or 400 gpm. Well 1 is primarily used for irrigation water and backup supply, while Well 2 is primarily used for potable water.

The WTP removes iron and manganese through injection of sodium hypochlorite prior to filtration. Sodium hydroxide is used for pH control, and ferric chloride is used for removal of arsenic. The disinfection system is in compliance with USEPA standards and the Federal Safe Drinking Water Act. The WTP currently has three automated treatment filters that produce 432,000 gpd of potable water upon demand, with space available to add a fourth filter. The filters are not currently operated at full capacity. The water storage tank is a welded steel tank located immediately south of the WTP with a capacity of 900,000 gallons. The tank is used for both potable water supply storage and fire protection.

The water distribution pump system is located within the WTP and draws water from the storage tank to pressurize the water distribution piping. A dedicated fire pump is capable of delivering 2,000 gpm for up to four hours. The existing Resort was constructed with three water line systems: potable water, recycled water (including some irrigation), and irrigation. Currently, the Resort's water needs are solely sourced through the potable water system as no source of reclaimed water is currently used at the Resort because recycled water has not been made available from the nearby Sonoma Water or City recycled water systems. The Resort's reclaimed water distribution piping was constructed to be used for irrigation water, toilets, and other uses.

Water Demand

Average water demands of the existing Resort included in **Appendix E** were calculated based on 2017-2019 demands due to the irregular demands associated with 2020 and 2021. As shown in **Table 4.8-1,** the current water demand of the existing Resort is approximately 183,900 gpd. The Proposed Project's water demand is projected to be approximately 153,900 gpd, for a cumulative demand of approximately 337,800 gpd. Demand is calculated as an average, and actual demand varies on a daily basis. The projected water demand was calculated based on project components such as the number of hotel rooms, the number of theatre and restaurant seats, and the square footage of the casino floor and pool.

It was assumed that the theatre would be used three days per week. Additionally, the existing resort demands includes existing irrigation demands, though it is noted that the Proposed Project would not include significant landscaping and may reduce the overall need for irrigation. The Proposed Project would increase the Resort's water demand by approximately 83.7 percent.

TABLE 4.8-1
EXISTING AND PROJECTED WATER DEMAND

Phase	Water Demand (gpd)	Maximum Month (gpd)
Existing Resort	183,900	241,400
Proposed Project	153,900	177,500
Total	**337,800**	**418,900**
SOURCE: **Appendix E**		

Wastewater Facilities

Existing wastewater facilities are described in detail within Section 3.3 of **Appendix E**. The Resort's wastewater disposal is conducted pursuant to the existing Joint Exercise of Powers Agreement (JEPA) between the City and the Tribe (City of Rohnert Park & Federated Indians of Graton Rancheria, 2012). Pursuant to Sections 4.4 and 11.8.7 of the Compact and the JEPA, the City provides wastewater treatment and disposal services to the Resort (Compact, 2012; City of Rohnert Park, 2012). Under the JEPA, the Tribe is currently allowed to discharge up to 200,000 gpd for "Phase 1" of the Resort, ~~410,000 gpd of wastewater,~~ although the current flows are ~~significantly~~ less than this. The wastewater produced by the Resort is gravity-collected in a sanitary sewer system and directed to a lift station. The lift station pumps the sewage through a force sewer main off-reservation to the City's sanitary sewer system, which conveys the sewage to the Laguna WWTP operated by the City of Santa Rosa. The gravity flow sewer main leading to the lift station is 8 inches in diameter and has a capacity of approximately 500,000 gpd, or 347 gpm. The lift station includes two pumps that can pump a maximum of 610,000 gpd each. The force sewer main following the lift station has a capacity exceeding 1,000,000 gpd.

Wastewater Generation

The current wastewater generation of the existing Resort is approximately 132,400 gpd. The Proposed Project's wastewater generation is projected to be approximately 124,600 gpd, for a cumulative generation of approximately 257,000 gpd. **Table 4.8-2** shows the existing and projected wastewater generation. Wastewater generation varies on a daily basis and is calculated as an average, based on a proportion of the estimated water demand of the various project components. As discussed above, per the JEPA, the Tribe is allowed to discharge up to ~~410~~200,000 gpd of wastewater. The JEPA also allows for an additional 210,000 gpd of capacity for "Phase 2" of the Resort, which the Tribe has not yet exercised and the window of time to do so has expired (further discussed below).

TABLE 4.8-2
EXISTING AND PROJECTED WASTEWATER GENERATION

Phase	Wastewater Generation (gpd)
Existing Resort	132,400
Proposed Project	124,600
Total	**257,000**
SOURCE: **Appendix E**	

4.8.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by the Off-reservation Environmental Impact Analysis Checklist (**Appendix A**) and have been used in this section to evaluate the potential off-reservation impacts of the Proposed Project on off-reservation water resources, hydrology, and water quality. Such impacts are considered significant if they would:

- Violate any off-reservation water quality standards or WDRs;
- Substantially deplete off-reservation groundwater supplies or interfere substantially with groundwater recharge such that there should be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation off-reservation;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding off-reservation;
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff off-reservation;
- Place within a 100-year flood hazard area structures, which would impede or redirect off-reservation flood flows; or
- Expose off-reservation people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

Assessment of potential impacts to water resources relied on previously gathered data, ongoing well level monitoring data, existing water use and wastewater generation data, and water demands and wastewater production levels projected in the Water Resources Analysis included as **Appendix E**.

Impact 4.8-1: The Proposed Project could violate water quality standards or waste discharge requirements.

Construction

As discussed in **Section 4.7**, a hazardous material spill or leak could pose a temporary hazard to off-reservation water quality during construction of the Proposed Project. BMPs included in **Section 3.2.3** would limit the amount of hazardous materials present on site to the minimal amount and least hazardous possible to complete work. Additionally, consistent with Project BMPs, hazardous materials would be handled appropriately to reduce the likelihood of spill events, such as use of secondary containment. Hazardous materials stored on the project site during construction could potentially compromise water quality if such a material were to spill and flow off-reservation. Prior to and during construction of the Proposed Project, the General Construction NPDES permit from the USEPA under federal requirements of the CWA will be complied with. Per the NPDES, a SWPPP will be prepared and implemented prior to and throughout construction of the Proposed Project.

The SWPPP will contain applicable measures to reduce off-reservation impacts associated with stormwater runoff and water quality. BMPs that will be included in the SWPPP to protect off-reservation water quality are outlined in **Section 3.2.3**. The SWPPP and BMPs will ensure that stormwater is collected and treated on site. The Proposed Project would therefore not violate water quality standards or waste discharge requirements.

There would be a less-than-significant impact.

Operation

As discussed in **Section 4.7**, potentially hazardous materials stored and used on the project site during construction of the Proposed Project would not remain during operation. Hazardous materials used during the operation of the expanded Resort would be limited to common hazardous materials such as cleaners and detergents, and increased quantities of water treatment chemicals. As previously mentioned, all hazardous materials would be properly stored and would not be discharged off-site. Wastewater generated at the Resort would continue to be treated at the Laguna WWTP operated by the City of Santa Rosa and would not result in violations of water quality standards or waste discharge requirements. As discussed further under **Impact 4.8-2**, recycled water would be used for the Proposed Project and may reduce the amount of wastewater that would be sent to the Laguna WWTP. If on-reservation treatment and recycling of wastewater were to occur, such treatment would be completed entirely on-reservation consistent with applicable treatment standards and would not violate water quality standards or waste discharge requirements.

There would be a less-than-significant-impact.

Impact 4.8-2: The Proposed Project could substantially deplete off-reservation groundwater supplies or interfere substantially with groundwater recharge such that there should be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

Groundwater Supply and Monitoring

Construction of the Proposed Project would be temporary and would require a nominal amount of water for activities such as dust control and would not increase the amount of hardscape on the reservation. This would not cause a depletion of off-reservation groundwater supplies and would not interfere with groundwater recharge.

As discussed above, the projected water demand of the Proposed Project is 153,900 gpd. However, as a BMP listed in **Section 3.2.3**, the Proposed Project would utilize Energy Star rated or WaterSense low-flow fixtures wherever possible. Use of low-flow WaterSense fixtures reduce water use by a minimum of 20 percent (USEPA, 2022b). Therefore, this analysis is conservative in using the full 153,900 gpd operational demand value.

Water demand of the Proposed Project constitutes less than one percent of existing groundwater pumping in the Santa Rosa Plain Sub-basin, without considering use of low-flow fixtures. Groundwater elevation monitoring is currently conducted by the Tribe to detect potential impacts of the Resort to off-reservation surrounding wells.

Monthly monitoring of groundwater elevations in monitoring wells is conducted within two miles of the Resort. The monitoring wells were also sampled for contaminants. To date no significant impacts to off-reservation wells have been identified. However, the Proposed Project would result in an increase of water usage of 83.7 percent (**Table 4.8-1**). Given the current and projected negative annual groundwater recharge rates in the Santa Rosa Plain, increasing use of groundwater on-<u>reservation</u> could cause a net deficit in aquifer volume or a lowering of the groundwater level. To help offset potential aquifer drawdown due to increased groundwater pumping associated with the Proposed Project, implementation of reclaimed water use at the Resort through either purchase of reclaimed water from the City or on-site production of reclaimed water is recommended, as described below.

Purchase of Reclaimed Water

The City of Rohnert Park is authorized to sell tertiary treated recycled water to users in the area. An agreement could be entered into with the City for one of three options:

1. A year-round connection to meet the recycled water demands of the existing Resort and Proposed Project, reducing water demands of the existing Resort and Proposed Project by 214,000 gpd.
2. An off-season connection to serve non-irrigation recycled water demands of the existing Resort and Proposed Project. Though exact water demands for landscaping on the Resort are not known, the decrease in recycled water demands compared to option (1) above would not be significantly lower than 214,000 gpd.
3. A year-round connection for servicing just the recycled water demands of the Proposed Project, totaling approximately 90,100 gpd.

The ability of the Tribe to purchase recycled water would rely upon City capacity to provide water and for the Tribe's facilities to be approved by the City. Updates to the existing water infrastructure may be necessary to satisfy City requirements to purchase recycled water, and the City may not be able to provide the total desired quantity of water due to supply shortages during certain high-demand periods.

On-reservation Water Reclamation

The Tribe has the option to construct an on-site WWTP capable of producing tertiary-treated reclaimed water. With development of an on-site WWTP, the Tribe could treat any portion of wastewater produced by the existing Resort and the Proposed Project, with remaining wastewater treated by the Laguna WWTP pursuant to the JEPA. <u>Under the JEPA, the Tribe is allowed to discharge up to 200,000 gpd for "Phase 1" of the Resort and up to 210,000 gpd for "Phase 2" of the Resort, which the Tribe has not yet exercised. Although the time for the Tribe to exercise its option to purchase Phase 2 capacity has expired, the Tribe would amend the JEPA with the City to utilize the Phase 2 allowance to accommodate wastewater of the Proposed Project via Mitigation Measure 4.8-3.</u>

In order to quantify potential on-reservation treatment scenarios, **Appendix E** evaluated the following options:

1. Treatment of sufficient wastewater to offset only the increase in water demands of the Proposed Project. This would result in approximately 153,900 gpd of wastewater treated on-reservation with 103,100 gpd treated by the Laguna WWTP.
2. Treatment of sufficient wastewater to meet all recycled water demands of the existing Resort and Proposed Project. This would result in approximately 214,000 gpd of wastewater treated on-reservation with 43,000 gpd treated by the Laguna WWTP.

3. Treatment of all of the wastewater produced by the existing Resort and Proposed Project. This would result in 257,000 gpd of wastewater treated on-reservation and no anticipated treatment of wastewater by the Laguna WWTP.

On-site reclaimed water production could occur adjacent to the existing WTP. It is noted that wastewater production and demand would vary seasonally and that a recycled water storage tank would be necessary to meet the necessary water treatment demands of options 2 and 3 above. The gpd outlined above represent an average across the course of a year. A detailed breakdown by month is included in **Appendix E**.

The Tribe could reasonably pursue either option above, or a combination of the two options. In order to confirm the reclaimed water program instituted by the Tribe would be sufficient to avoid significant impacts to groundwater supply or interference with groundwater recharge, **Mitigation Measure 4.8-1** could be implemented. With implementation of **Mitigation Measure 4.8-1**, impacts to groundwater levels and recharge beyond those evaluated and approved in the Final EIS and ROD would not occur and impacts would be less than significant.

Although use of recycled water would allow the existing Resort plus Proposed Project to operate within pumping rates approved in the ROD and with minimal to no excess groundwater use compared to existing demands, seasonal fluctuations in demand and recycled water production still have the potential to impact nearby wells. Therefore, **Mitigation Measure 4.8-2** would be implemented to ensure ongoing well monitoring occurs to identify and address impacts to nearby off-reservation wells.

There would be a less-than-significant impact with mitigation.

Impact 4.8-3: The Proposed Project could substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation off-site.

Construction of the Proposed Project would include minor earth-moving activities in an area that has been previously developed and paved. Stream or rivers would not be altered, and off-reservation drainage patterns would not be altered. Limited soil would be excavated to construct building foundations. Construction of the Proposed Project would require an import of approximately 7,500 cubic yards of soil (**Appendix D**) and would not result in stockpiling or alteration of on-reservation drainage. There is limited potential for construction activities to result in off-reservation siltation or sedimentation should soils be left improperly stored during construction, or should impaired stormwater discharge off-reservation. As discussed in **Section 3.2.3**, a SWPPP will be prepared for construction of the Proposed Project and will be adhered to throughout construction. The SWPPP will include BMPs to ensure that materials are properly stored and that necessary erosion control measures are in place. Additionally, stormwater would be directed towards existing stormwater basins on-reservation.

There would be a less-than-significant impact.

Impact 4.8-4: The Proposed Project could substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding off-site.

The Proposed Project would be constructed within existing paved areas, and would not alter the existing drainage pattern of the Resort or surrounding area. Surface water from the existing Resort and parking lots drains into bioswales thence retention basins on-reservation. On-reservation stormwater drainage areas would be modified, but the existing basins would be avoided and would continue to be sized to accommodate a 100-year storm event and excess capacity within other on-reservation drainage areas would be utilized (**Appendix D**). As discussed in **Section 3.2.3**, a SWPPP will be acquired prior to construction and will be adhered to throughout construction. The SWPPP will ensure the flow of stormwater on the project site will be properly collected and treated on-reservation. Additionally, the Proposed Project has been designed such that runoff from proposed facilities would be collected into the on-reservation stormwater collection system and treated on-site. As runoff would be collected and treated on-reservation within appropriately-sized basins, off-reservation flooding would not occur as a result of the Proposed Project. No ground disturbance would occur during operation of the Proposed Project.

There would be no impact.

Impact 4.8-5: The Proposed Project could contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff off-reservation.

The Proposed Project would be constructed over existing paved areas, and would not alter the existing drainage pattern of the area. Although stormwater detention basins on the reservation may be slightly modified, the capacity for the system would remain adequate to address a 100-year storm event (**Appendix D**). The Proposed Project would not increase stormwater runoff potential, and the Proposed Project would be designed to direct runoff to stormwater collection infrastructure. However, as discussed in **Section 4.7**, a hazardous material spill or leak could pose a temporary hazard to off-reservation water quality during construction of the Proposed Project. Construction activities associated with the Proposed Project also have the potential to result in off-reservation soil erosion, siltation, and contamination of stormwater, which could lead to adverse environmental consequences.

Prior to and during construction of the Proposed Project, the General Construction NPDES permit from the USEPA under federal requirements of the CWA shall be complied with. Per the NPDES, the required SWPPP will be prepared and implemented for the Proposed Project, and will contain applicable BMPs to reduce off-reservation impacts associated with stormwater runoff and water quality. BMPs to be included in the SWPPP in order to minimize the chance of a hazardous materials spill and to prevent off-reservation release of impaired runoff are outline in **Section 3.2.3**.

There would be a less-than-significant impact.

Impact 4.8-6: The Proposed Project could place structures which would impede or redirect off-reservation flood flows within a 100-year flood hazard area.

The Proposed Project would be constructed over existing paved areas, which are adequately engineered above the 100-year flood plain. Existing on-reservation stormwater detention basins would be modified, but would continue to provide the necessary capacity to address a 100-year storm event (**Appendix D**). The portion of the reservation within the floodplain is outside the area of direct impact. No flood control channels will be impeded or redirected by the Proposed Project.

There will be no impact.

Impact 4.8-7: The Proposed Project could expose off-reservation people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

The Proposed Project would not result in any development within a FEMA-defined 100-year floodplain. No flood control dams or levees are located within the vicinity of the project site, and the Proposed Project would not result in any disturbance or change to off-reservation dams or levees. Stormwater runoff would be collected and treated on-reservation. Therefore, the Proposed Project would not result in an increased risk of flooding, including flooding as a result of failure of a dam or levee.

There would be no impact.

4.8.4 MITIGATION MEASURES

4.8-1 The Tribe shall continue to implement the ongoing groundwater monitoring program in the approximately 11 monitoring wells within two miles of the Resort. Groundwater measurement procedures and standard operating procedures shall be based on the following: California Statewide Groundwater Elevation Monitoring for Select Sonoma County Basins and Sub-Basins prepared by Sonoma Water; the DWR Groundwater Elevation Monitoring Guidelines, and; the U.S. Geological Survey Quality-Assurance Plan for Groundwater Activities. Annual reports will be compiled in graphical format showing groundwater elevations at monitoring wells.

4.8-2 The Tribe shall implement a reclaimed water program on the reservation. The reclaimed water program shall consist of one of the options below, or a combination thereof, to reduce groundwater pumping of the Proposed Project by approximately 35 gpm.

Purchase of Reclaimed Water Option

The Tribe shall purchase and use reclaimed water from the City of Rohnert Park. The Tribe shall be responsible for constructing additional infrastructure on-reservation as needed to supplement the existing recycled water system. If this option is chosen, the JEPA shall be amended accordingly in coordination with the City.

On-site Reclaimed Water Production Option

A wastewater treatment facility shall be constructed to treat wastewater to a tertiary level for reclaimed water production. The Tribe shall be responsible for constructing additional infrastructure on-reservation as to supplement the existing recycled water system. The WWTP would be located near the existing WTP on an existing disturbed or paved surface.

Underground Injection Option

Recharge of the groundwater basin shall be explored through use of leach fields or other underground injection methods. Additional geotechnical studies would be required to estimate feasibility of recharge systems given the anticipated low permeability of on-site soils.

4.8-3 The Tribe shall amend the JEPA with the City to extend the timeline to utilize the Phase 2 allowance and accommodate wastewater of the Proposed Project. This does not include the parking garage, as this component of the Proposed Project would not generate wastewater.

4.9 LAND USE

This section addresses the existing land uses and zoning of the surrounding region and evaluates potential off-reservation environmental impacts that may result from implementation of the Proposed Project.

4.9.1 REGULATORY SETTING

State and Local

The Proposed Project is located on trust land and is not subject to State or local land use laws and regulations. However, such laws and regulations apply to off-reservation land in the vicinity of the project site.

Williamson Act

The California Land Conservation Act of 1965, better known as the Williamson Act, enables local governments to enter into contracts with private land owners to maintain agriculture or open space on properties in exchange for lower property tax assessments. Land uses compatible with agricultural production are determined by the county or city administering the contract. Contracts have a term of at least 10 years and are automatically renewed unless a notice of cancelation is given (California Department of Conservation, 2019).

Santa Rosa Plain Conservation Strategy

The U.S. Fish and Wildlife Service (USFWS), in cooperation with the U.S. Environmental Protection Agency (USEPA), U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), and the Regional Water Quality Control Board (RWQCB), have developed a strategy dedicated to conserving and contributing to the recovery of certain federally listed species of the Santa Rosa Plain and their habitats. The Santa Rosa Plain Conservation Strategy identifies potential habitat and survey guidelines for five special-status species known to occur within the Santa Rosa Plain; California Tiger Salamander (CTS), Burke's goldfields, Sonoma sunshine, Sebastopol meadowfoam, and the many-flowered navarretia (USFWS, 2005). The Santa Rosa Plain Conservation Strategy accomplishes conservation in a manner that protects stakeholders' (both public and private) land use interests, and supports issuance of an authorization for incidental take of CTS and special-status plants that may occur in the course of carrying out project activities on the Santa Rosa Plain.

Sonoma County General Plan

The Land Use Element provides the distribution, location, and extent of uses of land for housing, business, industry, open space, agriculture, natural resources, and other uses. For each appropriate land use category, the Sonoma County General Plan includes standards for population density and building intensity. The Open Space and Resource Conservation Element contains policies and goals intended to preserve natural and scenic resources of the County. Scenic resources are divided into subcategories including: Community Separators, Scenic Landscape Units, and Scenic Corridors. Designated scenic resources and corridors provide visual links to recreational areas, access to historic areas, and serve as scenic entranceways to cities. Within the vicinity of the Project Parcels, the Open Space and Resource Conservation Element identifies the Sonoma Mountains as a scenic backdrop to the community. The Element also identifies portions of US-101 as a designated scenic corridor (Sonoma County, 2016a).

Sonoma County Zoning Ordinance

Chapter 26 of the Sonoma County Municipal Code contains the Zoning Ordinance for the County and regulates the location and uses of structures and land. The Zoning Ordinance establishes various districts within the unincorporated territory of the County and designates lawful permitted land uses. The zoning ordinance dictates allowable land uses within the various zoning districts, including the types of structures and certain design characteristics of such structures that can be constructed. In addition, the Zoning Ordinance designates the limitation of height and bulk of future building, and maintains that certain open areas be required around future buildings. The purpose of the Zoning Ordinance is to promote and protect the public welfare, to provide for the orderly and beneficial land use of the County, to protect economic stability of agricultural, residential, commercial, industrial and other communities within the County, to protect and conserve the scenic resource characteristics of the County, and to provide for the orderly processing of development projects as anticipated by the California Permit Streamlining Act.

Sonoma County Agricultural Preservation and Open Space District Comprehensive Plan 2021

In 2000, SCAPOSD adopted a plan to purchase land and easements and identified the Laguna de Santa Rosa as a priority riparian and wetland area, and a priority greenbelt area. The 2006 plan further developed those goals. In 2021, the Sonoma County Agricultural Preservation and Open Space District (SCAPOSD also known as Ag + Open Space) adopted a long-range comprehensive plan through 2031. The current plan further develops land strategies and actions, incorporating new data to inform conservation strategies and actions within Sonoma County and provides interactive maps outlining specific priority areas (SCAPOSD, 2021).

City of Rohnert Park General Plan, NWSP, and WDSP

Chapter 2 of the City's General Plan, the Land Use and Growth Management Element, identifies land use guidelines and polices. Policies constitute the framework of the General Plan. Issues related to urban design and development character are addressed in Chapter 3, Community Design. Policies of the North West Specific Plan (NWSP) provide development standards concerning height, building setbacks, parking requirements, and changes in land use. The Wilfred/Dowdell Village Specific Plan (WDSP) applies to approximately 20.19 acres generally south of Wilfred Avenue.

Rohnert Park California Municipal Code Title 17 Zoning Ordinance

Title 17 of the Rohnert Park Municipal Code contains the Zoning Ordinance for the City. The Zoning Ordinance establishes various zoning districts of the city, identifies the types of land uses permitted in each district, and provides regulations and standards associated with the development and operation of such land uses. Chapter 17.10 of the Zoning Ordinance provides the development standards table that provides the required site area and dimensional requirements for lots within each district, including maximum building heights, minimum building setbacks, minimum open space requirements, floor area ratios, and maximum lot coverages. Subsequent sections explain how such land uses are maintained.

4.9.2 ENVIRONMENTAL SETTING

The project site consists of a previously paved lot used for Resort parking. Surrounding land uses include the existing casino and Resort infrastructure to the immediate north, west and south, agricultural land and open space to the east and west, rural residential scattered to the north and northeast of the Resort, and commercial development to the south. Commercial development consists of a mobile home park and a business park located adjacent to the southern boundary of the reservation along Business Park Drive.

The reservation is bordered by areas under jurisdiction of Sonoma County and areas under jurisdiction of the City of Rohnert Park. Land use designations within unincorporated Sonoma County near the project site include agriculture and rural residential. Land use designations within the City of Rohnert Park near the project site include commercial and mixed use. County zoning designations for off-reservation land in the vicinity of the project site include Land Extensive Agriculture (LEA), Agricultural Residential (AR), Diverse Agriculture (DA), and Rural Residential (RR). Much of the County's unincorporated area is zoned for various intensities of agricultural uses (**Figure 9**).

City zoning designations for off-reservation parcels located near the project site include Industrial (I-L), Regional Commercial (C-R), and Specific Plan (S-P). S-P zoning allows for implementation of a specific plan with multiple uses. The S-P zoning directly adjacent to the project site is dictated by the City's NWSP and WDSP, which includes flex industrial, commercial, and mixed-use land uses (City of Rohnert Park, 2014). According to Articles II and III of Chapter 17.06 of the Rohnert Park Municipal Code, the purposes of commercial and industrial land uses are to provide for effective integration of such uses so that impacts related traffic, noise, light, etc. are minimized.

4.9.3 Impact Analysis

Significance Criteria

The following criteria are established by Section X of the Checklist (**Appendix A**) and have been used in this section to evaluate potential off-reservation impacts of the Proposed Project on off-reservation land uses and zoning. Such impacts are considered significant if they would:

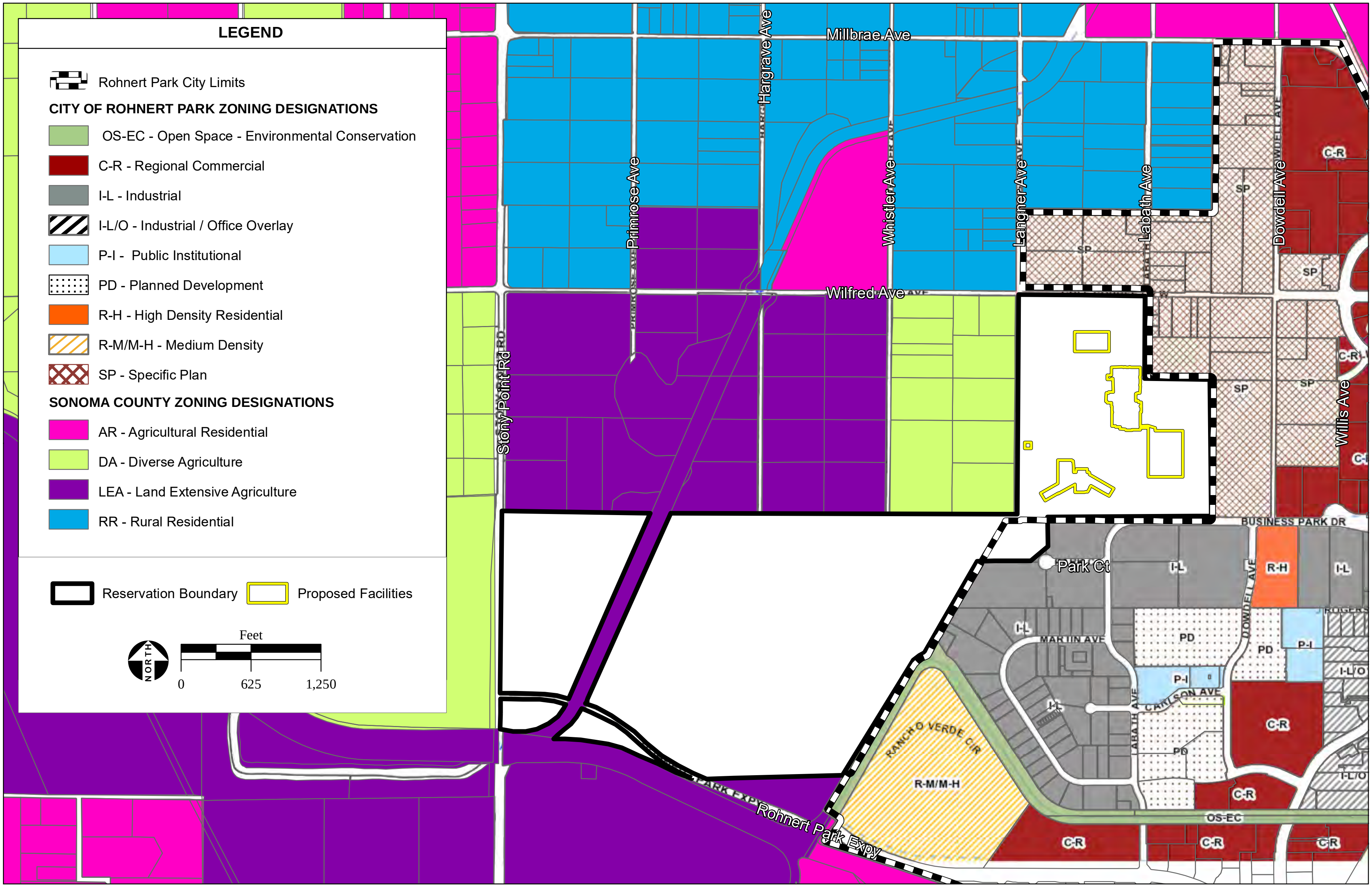
- Conflict with an off-reservation land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating an environmental effect; or
- Conflict with an applicable habitat conservation plan or natural community conservation plan covering off-reservation land.

The following analysis identifies potential off-reservation environmental impacts of the Proposed Project related to land use and zoning. The impact analysis compares existing conditions described above to foreseeable changes to existing conditions that would be likely to result from implementation of the Proposed Project. The evaluation of off-reservation environmental impacts in this section consisted of the following:

- Field observations;
- Review of planning documents; and
- Review of site plans for and infrastructure improvements associated with the Proposed Project.

Impact 4.9-1: The Proposed Project could conflict with an off-reservation land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating an environmental effect.

The Proposed Project would be built and operated entirely on trust land, and would not impact off-reservation land use and zoning. While the County and City General Plans do not apply to the trust land itself, both apply to off-reservation land uses within the respective jurisdictional boundaries.



SOURCE: Sonoma County GIS, 2012; City of Rohnert Park Development Services, 2013; Montrose Environmental, 11/1/2022

Graton Resort & Casino Expansion Project / 203523

Figure 9
Surrounding Zoning

The Proposed Project would not result in changes to off-reservation land use, and, as such, would remain consistent with the Sonoma County and City of Rohnert Park General Plan. The Proposed Project is consistent with the existing land uses on the reservation and would not preclude off-reservation land uses.

There would be no impact.

Impact 4.9-2: The Proposed Project could conflict with an applicable habitat conservation plan or natural community conservation plan covering off-reservation land.

No HCP, NCCP, or other approved local, regional, or state HCPs have been adopted that are applicable to the Proposed Project. The Proposed Project is consistent with the Santa Rosa Plain Conservation Strategy and would not impact wetlands or special-status species.

There would be no impact.

4.9.4 Mitigation Measures

None.

4.10 NOISE

This section addresses potential noise issues of the project site, evaluates potential off-reservation impacts that may result from the implementation of the Proposed Project, and presents mitigation measures, if necessary, to reduce identified significant impacts to off-reservation sensitive receptors. Sensitive receptors may include residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, parks, and other areas that are considered more sensitive to noise than commercial and industrial land uses.

4.10.1 REGULATORY SETTING

Federal

Code of Federal Regulations

Federal regulations establish noise limits for medium and heavy trucks under 40 Code of Federal Regulations (CFR) 205 (B). The federal truck pass-by noise standard is 80 decibels (dB) at 50 feet from the vehicle pathway centerline.

The U.S. Department of Housing and Urban Development

The U.S. Department of Housing and Urban Development (HUD) provides noise standards to encourage the control of noise at its source in cooperation with other Federal departments and agencies, and encourage land use patterns for housing and other noise-sensitive urban needs that will provide a suitable separation between them and major noise sources. HUD considers an acceptable noise level for residential units to be 65 dB (24 CFR Part 51).

The Federal Interagency Committee on Noise

The Federal Interagency Committee on Noise (FICON) provides guidance in how to assess noise impacts resulting from aircraft operations, shown in **Table 4.10-1** below. However, although FICON recommendations were specifically developed to assess aircraft noise impacts, these criteria have been applied to other sources of noise similarly described in terms of cumulative noise exposure metrics.

TABLE 4.10-1
SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE LEVELS

Ambient Noise Level Without Project, Ldn	Increase Required for Significant Impact
< 60 dB	+ 5.0 dB or more
60 to 65 dB	+ 3.0 dB or more
> 65 dB	+ 1.5 dB or more
SOURCE: FICON, 1992	

State and Local

The Proposed Project is located on trust land and is therefore not subject to State or local laws and regulations. However, such laws and regulations apply to off-reservation land in the vicinity of the Proposed Project.

California Code of Regulations

The State of California establishes noise limits for vehicles licensed to operate on off-reservation public roads. For heavy trucks, the State pass-by noise standard is equal to the federal standard (80 dB). The State pass-by standard for light trucks and passenger cars is also 80 dB at 15 feet from the centerline. The State has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (CNIS; Title 24, CCR). The CNIS set forth an off-reservation interior day-night average noise level (Ldn) standard of 45 dB in any habitable room. An acoustical analysis is required demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than 60 dB Ldn.

Sonoma County General Plan

The Noise Element of the plan provides a policy framework for addressing potential noise impacts encountered in the planning process. The Noise Element is intended to provide ways to reduce existing and future noise conflicts. It includes policies and measures to achieve noise compatibility between land uses. In accordance with State law and guidelines, the Noise Element identifies noise sources and noise-sensitive land uses. It quantifies noise levels using noise exposure contours for current and projected conditions within the County. This noise exposure information serves as a basis for achieving land use compatibility within each community and provides baseline levels and noise source identification for use in a noise control ordinance or during the review of proposed development projects. Additionally, the plan provides maximum allowable noise exposures, shown in **Table 4.10-2**.

TABLE 4.10-2
MAXIMUM ALLOWABLE EXTERIOR NOISE EXPOSURES FOR NON-TRANSPORTATION NOISE SOURCES

Hourly Noise Metric[1], dBA	Daytime (7 am to 10 pm)	Nighttime (10 pm to 7 am)
L50 (30 minutes in any hour)	50	45
L25 (15 minutes in any hour)	55	50
L08 (4 minutes 48 seconds in any hour)	60	55
L02 (72 seconds in any hour)	65	60

[1]The sound level exceeded n% of the time in any hour. For example, the L50 is the value exceeded 50% of the time or 30 minutes in any hour; this is the median noise level. The L02 is the sound level exceeded 1 minute in any hour.
SOURCE: Sonoma County, 2012a

City of Rohnert Park General Plan

Section 8.0 of the General Plan describes noise characteristics and regulations as they apply within the City. Goals and polices intend to minimize the exposure of sensitive receptors including residences, schools, churches, hospitals, and other public uses-to excessive noise levels. Exterior day/night noise levels above 70 dB are normally unacceptable for the majority of land use categories. New construction or development is therefore discouraged above this threshold, and a detailed analysis of noise reduction requirements is needed, as well as noise insulation features included in proposed designs if development proceeds (City of Rohnert Park, 2000). Land use categories are normally or conditionally acceptable to noise levels below 65 dB. Refer to Figure 8.3-1 in the City of Rohnert Park General Plan for land use compatibility of community noise levels (City of Rohnert Park, 2000).

4.10.2 ENVIRONMENTAL SETTING

Noise is often defined as unwanted sound. Pressure variations that occur frequently (at least 20 times per second) for the human ear to detect are called sound. The number of pressure variations per second is the frequency of sound, and is expressed as cycles per second in units of hertz (Hz). The perceived loudness of sound is dependent on factors related to sound pressure level and frequency content. The decibel scale measures sound levels using the hearing threshold (20 micropascals of pressure) as the point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum (20 Hz to 20,000 Hz). As a result, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes frequencies below 1,000 Hz and above 5,000 Hz to better represent the human ear's sensitivity to mid-range frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard method of frequency de-emphasis and is typically applied to community noise measurements. In practice, the level of a sound source is measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. All noise levels reported herein are A-weighted unless otherwise stated. The effects of noise on individuals can be divided into three categories:

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- 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 third category. There is no completely satisfactory way to measure subjective effects of noise or corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different noise tolerances develop (Caltrans, 2013).

Generally, most noise is generated by transportation systems, primarily motor vehicles, aircraft, and railroads. Poor urban planning may also give rise to noise pollution, since juxtaposing industrial and residential land uses can adversely affect residential acoustic environments. Prominent sources of indoor noise include office equipment, factory machinery, appliances, power tools, lighting hum, and audio entertainment systems. A method of predicting human reaction to a new noise environment is the way it compares to the existing environment (or ambient noise) to which one is accustomed to. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be to those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 2013):

- Under controlled conditions in an acoustics laboratory, the trained ear is able to discern changes in sound levels of 1 dBA;
- Outside such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise;
- It is widely accepted that the average human ear, however, can barely perceive noise level changes of 3 dBA;
- A change in level of 5 dBA is a readily perceptible increase in noise level; and
- A 10-dBA change is recognized as twice as loud as the original source.

Noise levels are measured on a logarithmic scale. On a logarithmic scale, the sum of two noise sources of equal loudness is 3 dBA greater than noise generated by only one noise source. To apply this formula to a specific noise source, in areas where existing levels are dominated by traffic, a doubling in traffic volume will increase ambient noise levels by 3 dBA. Similarly, a doubling in heavy equipment use would also increase ambient noise levels by 3 dBA. A 3 dBA increase is the smallest change in noise level detectable to the average individual. A change in ambient sound of 5 dBA can begin to create concern. A change in sound of 7 to 10 dBA typically elicits extreme concern (Caltrans, 2013).

Community Noise

An individual's noise exposure is a measure of noise over a period of time. Community noise is the product of multiple distant noise sources, which constitute a relatively stable background noise exposure. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. The addition of short-duration noise sources such as aircraft flyovers, moving vehicles, and sirens make community noise constantly variable throughout a day. These successive additions of sound to the community noise environment vary the community noise level, requiring the measurement of noise exposure over a period of time to characterize a community noise environment and evaluate cumulative noise impacts.

Nighttime ambient noise levels are typically lower than daytime ambient noise levels. For this reason, and because of the potential for sleep disturbance, individuals tend to be more sensitive to increased noise levels at night than during the day. Increases in nighttime noise have a greater impact on the community noise environment than increases in daytime noise.

Noise Attenuation

Stationary "point" sources of noise, including heating, ventilation, and air conditioning systems (HVAC) and stationary mobile sources such as idling vehicles, decrease at a rate of 6 dBA to 9 dBA per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.) (Caltrans, 2013). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles (a "line" source), would typically attenuate at a lower rate, approximately 4 to 6 dBA per doubling distance from the source (Caltrans, 2013). Noise from large construction sites (with heavy equipment moving dirt and trucks entering and exiting the site daily) would have characteristics of both "point" and "line" sources. Attenuation would generally range between 4.5 and 7.5 dBA per doubling of distance.

Vibration

The effects of groundborne vibration typically cause only a nuisance to individuals, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically an annoyance only indoors where the associated effects of the building shaking can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may consist of the rattling of windows or dishes on shelves.

Peak particle velocity (PPV) is often used to measure vibration. PPV is the maximum instantaneous peak (inches per second) of the vibration signal. Scientific studies have shown that human responses to vibration vary by the source of vibration, which is either continuous or transient. Continuous sources of vibration include construction, while transient sources include truck movements.

Generally, the thresholds of perception and annoyance are higher for transient sources than for continuous sources. Structural damage can occur when PPV values are 0.5 inches per second or greater. Annoyance can occur at levels as low as 0.1 inches per second and become strongly perceptible at approximately 0.9 inches per second (Caltrans, 2020). **Table 4.10-3** shows PPV vibration levels caused by representative construction equipment, as published by the Federal Transit Administration (FTA).

TABLE 4.10-3
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV at 25 feet (in/sec)
Large bulldozer	0.089
Excavator	0.089
Scraper	0.089
Loaded trucks	0.076
Small bulldozer	0.003
SOURCE: FTA, 2018	

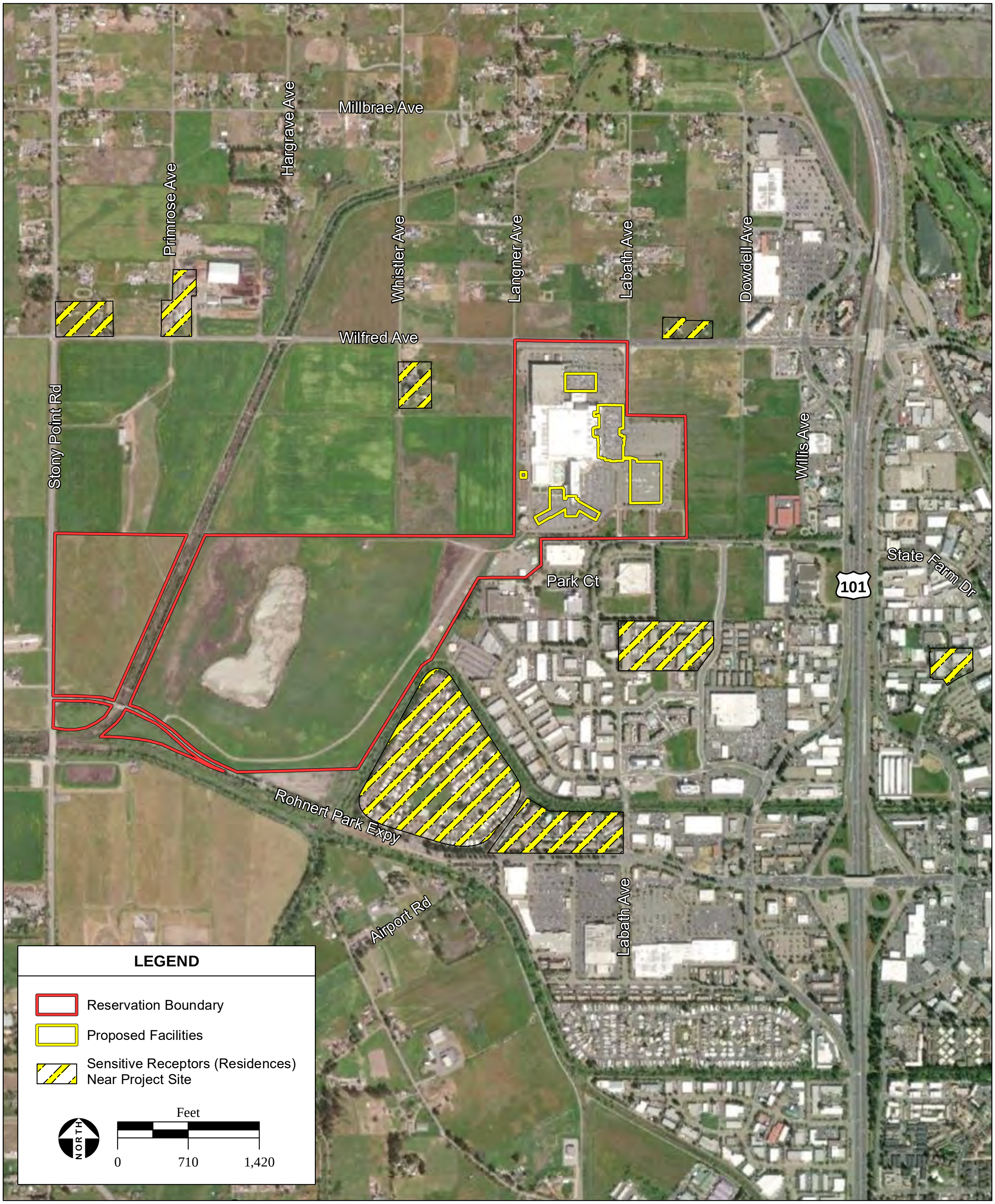
Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others, sensitivity being a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and other outdoor recreation areas are considered more sensitive to noise than commercial and industrial land uses, and are referred to as sensitive receptors. The nearest residences to the project site are located on Wilfred Avenue, approximately 0.15 miles northeast of the project site where groundbreaking would occur. Another residence occurs approximately 0.25 miles to the northwest of the westmost component of the Proposed Project. Additionally, Fiori Estates and the Reserve at Dowdell (apartment complexes) are approximately 0.25 miles from the project site and from construction access.

The closest school, Pathways Charter School, is located approximately 0.65 miles east of the project site on Professional Center Drive. The closest assisted living facility is Brookdale, which is located approximately two miles east of the project site on Snyder Lane. The nearest medical facility is Concentra Urgent Care, located 1.15 miles southeast of the project site on State Farm Drive. **Figure 9** shows sensitive receptor locations relative to the project site. Noise levels increase further from the project site and nearer to US-101. The project site and existing Resort have lower noise levels when compared to noise levels of nearby commercial buildings and US-101.

Noise Environment of the Project Site

The noise environment of the project site is influenced by traffic on US-101 and other roadways, parking lot activity, and Resort mechanical equipment. **Table 4.10-4** shows maximum noise levels of typical construction equipment. Stationary point sources of construction noise decrease at a rate of 6 to 9 dBA per doubling of distance from the source, depending on environmental conditions. An attenuation factor of 3.0 dBA per doubling of distance is appropriate for this analysis given the flat topography and lack of vegetation surrounding the project site. Not all equipment listed may be used for the construction of the Proposed Project.



SOURCE: Maxar aerial photograph, 4/16/2021; Montrose Environmental, 11/1/2022

Figure 10
Sensitive Receptors

TABLE 4.10-4
STANDARD CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Maximum Level, dB at 50 feet
Backhoe	78
Compactor	83
Air Compressor	78
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85
SOURCE: FWHA, 2006	

Noise Environment of the Surrounding Area

The off-reservation area surrounding the project site is primarily agricultural land, rural residential, and commercial development. US-101 is approximately 0.40 miles east of the project site. Traffic on US-101 is the primary source of off-reservation noise in the area, with local stationary noise sources and distant State Route 116 (SR-116) traffic contributing to a lesser extent.

4.10.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by Section XII of the Checklist (**Appendix A**) and have been used in this section to evaluate the potential impacts of the Proposed Project on the off-reservation ambient noise level. Accordingly, an impact is considered significant if it would result in:

- Exposure of off-reservation individuals to noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of off-reservation persons to excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the off-reservation vicinity of the Proposed Project; or
- A substantial temporary or periodic increase in ambient noise levels in the off-reservation vicinity of the Proposed Project.

A noise impact from a transportation-related source is considered significant if the incremental increase in noise is greater than 5.0 dBA Leq in a noise environment of 60 dBA CNEL or less, an increase of 3.0 dBA Leq in a noise environment between 60 and 65 dBA CNEL, or an increase of 1.5 dBA Leq in a noise environment greater than 65 dBA CNEL (FICON, 1992; FTA, 2018). An impact would be considered significant if the Proposed Project were to increase ambient noise levels in off-reservation areas by more than 1.5 dBA, 3.0 dBA, or 5.0 dBA, depending on the baseline ambient noise level at each location analyzed.

HUD provides an acceptable noise threshold as 65 dB for residential noise receptors. Community noise exposure of less than 50 dBA during the daytime and 45 dBA during nighttime hours (both at an hourly noise metric of L50) is considered acceptable by the County (**Table 4.10-2**). The County's significance threshold for sensitive receptors is lower than HUD's significance threshold of 65 dBA. An audible increase in the day/night noise level of over 50 dBA Ldn at the nearest off-reservation sensitive receptor is considered to be potentially significant.

Excessive groundborne vibrations are defined as equal to or exceeding 0.5 PPV at the nearest off-reservation non-residential structure, and exceeding 0.1 PPV experienced at the nearest off-reservation residence (Caltrans, 2020; FTA, 2018). Therefore, an off-reservation impact is considered potentially significant if construction and/or operation of the Proposed Project would result in an increase of 0.5 PPV at the nearest off-reservation non-sensitive structure, or 0.1 PPV at the nearest off-reservation sensitive receptor.

Projected off-reservation traffic volumes due to an increase in trip generation from the Proposed Project (**Appendix G**) were compared to existing off-reservation traffic volumes. Federal Highway Administration (FHA) guidelines were used to determine off-reservation noise levels along roadways in the vicinity of the project site.

Impact 4.10-1: The Proposed Project could result in an exposure of off reservation persons to noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Construction

Construction of the Proposed Project would consist of earthwork, foundation construction, erection of buildings, and finishing work. All construction would be conducted on-reservation using standard construction equipment. Noise levels for standard construction equipment are shown in **Table 4.10-4**. Construction noise impacts would be significant if extensive nighttime operations were to occur or excessively loud equipment was regularly used. Noise from large construction sites (with heavy equipment moving dirt and trucks entering and exiting the project site daily) would have characteristics of both "point" and "line" sources. Calculations utilized a 6.0 dBA per doubling of distance.

Based on **Table 4.10-4**, the maximum projected construction noise level on the project site would be approximately 89 dBA at a distance of 50 feet from the equipment. This is a conservative maximum noise level based on the assumption that louder equipment (such as jackhammers) would be used. However, not all equipment would be used simultaneously, and not all equipment would be used on a daily basis. High-volume equipment such as jackhammers would only be used intermittently throughout days that they are used, and only during portions of the construction phase. Thus, the actual noise level would generally be lower than the maximum potential calculated.

Figure 9 identifies the closest sensitive receptor to the project site, as well as several other sensitive receptors in close proximity to the reservation in order to identify sensitive receptors in a variety of directions and in close proximity to each project component. The nearest sensitive receptor to the project site is a single-family detached residence located on Wilfred Avenue/Golf Course Drive West in between Labath Avenue and Dowdell Avenue. The residence is approximately 752 feet from the theatre, the nearest project component to this sensitive receptor. At this distance, the loudest piece of equipment that may be used during construction would generate a noise level of 65.5 dBA.

Remaining equipment likely to be used on the project site range from 76 to 85 dBA, which would result in a noise level of 52.5 to 61.5 dBA at this sensitive receptor. A noise level of 65.5 dBA exceeds HUD standards by 0.5 dBA, a difference that is not detectible to the human ear. This level of noise would only be produced intermittently and would generally be below the HUD standard.

The County General Plan generally allows only minimal noise production per hour in excess of 65 dBA. It is noted that the General Plan Policy NE-1h regarding a noise control ordinance may exempt or modify noise requirements for construction activities. Additionally, historical noise monitoring located immediately east of this sensitive receptor suggests that ambient noise levels exceed 65.5 dBA (AES, 2018a).

Ambient noise levels are lower at other sensitive receptors, however, these are further from the project site and would therefore be exposed to lower sound levels. For example, ambient noise levels decrease west of the reservation and further from US-101. The nearest sensitive receptor west of the reservation is 1,352 feet from the project site, specifically the theatre. At this distance, the loudest construction equipment would generate intermittent noise up to 60.4 dBA, with a more common noise range of up to 56.4 dBA. Although this is within the HUD limits, the County General Plan generally allows only minimal noise production in excess of 60 dBA (about 5 minutes per hour). It is noted that the General Plan Policy NE-1h regarding a noise control ordinance may exempt or modify noise requirements for construction activities. Construction would be temporary, and use of the loudest equipment would be limited. Noise production during construction would generally be below applicable noise standards or would not exceed ambient noise levels. Additionally, construction would follow the BMPs outlined in **Section 3.2.3** that would limit construction to daytime hours and would ensure mufflers are utilized on equipment where possible. Therefore, construction of the Proposed Project would generally fall under applicable noise thresholds, and would only exceed ambient noise levels at select sensitive receptors west of the reservation and only during intermittent use of the loudest equipment. Periodic use of the loudest anticipated equipment over a discrete time period limited to daytime hours would not be inconsistent with applicable noise thresholds.

There would be a less-than-significant impact.

Operation

The loudest operational component of the Proposed Project would be the theatre. The theatre would not be utilized daily, however, it has the potential to host events such as concerts that could extend into the later night hours. Additionally, the theatre is the nearest component to off-reservation sensitive receptors. Concert noise levels can reach up to 105 to 120 dBA at the source (CDC, 2021). However, the theatre would be indoors and therefore would reduce the volume that off-Reservation sensitive receptors would be exposed to. As discussed in **Section 3.2.3**, the theatre would be designed with soundproofing measures that would, at a minimum, adhere to Sonoma County noise thresholds at existing sensitive receptors. The hotel would be designed consistent with the existing hotel tower and would not exceed noise production existing on-reservation. Other project components such as the pool, casino floor, and restaurant would similarly not generate noise levels in excess of existing on-reservation noise levels.

There would be a less-than-significant impact.

Impact 4.10-2: The Proposed Project could result in exposure of off-reservation persons to excessive groundborne vibration or groundborne noise levels.

Construction

Construction activities for the Proposed Project would generally consist of standard earthmoving equipment shown in **Table 4.10-4**. Excessive vibration is usually only an issue when construction requiring the use of equipment with high vibration levels occurs within 25 to 100 feet of an existing structure.
The nearest off-reservation sensitive receptor is a rural residence located approximately 752 feet northwest of the project site. **Table 4.10-5** provides estimated construction vibration levels at these distances. The predicted PPV levels for construction of the Proposed Project are well below the significance thresholds of 0.5 PPV for non-Residential structures and 0.1 PPV for off-reservation residences.

TABLE 4.10-5
PREDICTED PPV AT 752 FEET FROM CONSTRUCTION

Equipment	Reference PPV (inches/second) at 25 feet	Predicted PPV (inches/second) at 752 feet
Large bulldozer	0.089	0.00054
Excavator	0.089	0.00054
Scraper	0.089	0.00054
Loaded Truck	0.076	0.00046
Small bulldozer	0.003	0.00002
NOTES: PPV was predicted using the equation $PPV_{predicted} = PPV_{ref}(D_{ref} / D_{source})^{1.5}$ SOURCE: FTA, 2018		

There would be a less-than-significant impact.

Operation

Operation of the Proposed Project would not generate significant sources of groundborne vibration or noise. Off-reservation loaded trucks and buses traveling to and from the project site would be the main source of off-reservation vibration during operation. The number of loaded trucks on the roadways surrounding the project site would not increase substantially and therefore would not create vibrational impacts at nearby sensitive receptors. Bus usage generated by the Proposed Project would slightly increase. Vibrations from buses can be 0.012 PPV at distance of 50 feet, which is well below the most stringent PPV vibration significance criterion of 0.1 PPV. Therefore, the additional bus traffic serving the Proposed Project would not expose off-reservation sensitive receptors to excessive groundborne vibration or groundborne noise levels.

There would be a less-than-significant impact.

Impact 4.10-3: The Proposed Project could result in a substantial permanent increase in ambient noise levels in the off-reservation vicinity of the project.

Noise generated by the operation of the Proposed Project with the potential to impact off-reservation sensitive receptors would include noise from additional loading/unloading activities at delivery areas, additional vehicles operating on the project site, and additional HVAC systems. These activities would not occur at a noise level such that a substantial off-reservation noise increase would occur. The main operational noise sources attributable to the Proposed Project would be an increase in trip generation.

The Proposed Project would only generate an average of approximately 332 AM peak hour trips (180 inbound and 152 outbound) and 628 PM peak hour trips (284 inbound and 344 outbound), further detailed in **Appendix G**. Vehicle speed would not be altered by the Proposed Project. Therefore, noise associated with increased speeds or stop and go of unacceptable LOS intersections would not occur.

Additionally, only a small proportion of the increase in vehicle traffic would be attributable to larger vehicles making deliveries to the project site as the majority of vehicle trips would be attributable to increased patronage. Therefore, off-reservation traffic from the Proposed Project would not result in a significant audible increase in ambient noise levels above applicable standards.

Roof-mounted HVAC systems may be utilized, which have the potential to be audible at nearby locations. HVAC systems are stationary noise sources, which decrease at a rate of 6-9 dBA per doubling of distance from the source. Noise levels produced by HVAC systems vary with the unit capacity and design, but can be approximately 60 dBA at close range. Given the distance to the nearest sensitive noise receptor from the project site, noise from roof-mounted HVAC systems would not be audible. Using an attenuation factor of 6.0 dBA Leq per doubling of distance, maximum average noise levels at the closest sensitive receptor would be below the County threshold of 50 dBA Leq and HUD’s threshold of 65 dBA for nearby sensitive receptors.

There would be a less-than-significant impact.

Impact 4.10-4: The Proposed Project could result in a substantial temporary or periodic increase in ambient noise levels in the off-reservation vicinity of the project.

As discussed above in **Impact 4.10-1,** the potential for the Proposed Project to create a temporary excessive increase in off-reservation noise levels is limited to the construction phase. The conservative analysis described in **Impact 4.10-1** concluded that maximum construction noise levels could exceed County thresholds during infrequent and temporary use of the loudest potential construction equipment, but would generally not exceed ambient noise levels or thresholds. BMPs outlined in **Section 3.2.3** would restrict the timing of construction to daytime hours and would reduce the level of noise produced by properly muffling equipment.

The loudest component of the Proposed Project is the theatre, discussed in detail under **Impact 4.10-1**. As discussed in **Impact 4.10-1**, the theatre would be soundproofed such that existing nearby sensitive receptors would not be subject to noise in excess of the Sonoma County General Plan nighttime noise threshold of 45 dBA. This value is lower than noise measurements previously taken in the vicinity of the reservation (AES, 2018a). Therefore, ambient noise levels would not be exceeded.

There would be a less-than-significant impact.

4.10.4 MITIGATION MEASURES

None.

4.11 POPULATION AND HOUSING

This section addresses the existing population and housing of the region and evaluates potential off-reservation growth-inducing effects that may result from implementation of the Proposed Project.

4.11.1 REGULATORY SETTING

State and Local

The project site is located on trust land and is not subject to State or local laws and regulations concerning population and housing. However, such laws and regulations apply to off-reservation land in the vicinity of the project site.

California Government Code

Sections 65580 through 65589.11 of the California ~~Code –~~ Government Code describes goals and responsibilities of local governments and the state to address regional housing needs. Government Code Section 65583 states that county and city housing elements shall "[c]~~C~~onserve and improve the condition of the existing affordable housing stock…." The ~~California~~Government Code also specifies a process for determining each local jurisdiction's fair share of regional housing needs, called the Regional Housing Needs Allocation Plan (RHNA). The California Department of Housing and Community Development assigns each regional council of governments a necessary number of new housing units for that region, including affordable housing. Each local government in California is required to adopt a Housing Element as part of its General Plan that shows how the community plans to meet the existing and projected housing needs of people at all income levels. Specifically, Government Code Section 65584.04 states: ~~that~~ "The final allocation plan shall ensure that the total regional housing need, by income category, as determined under Section 65584, is maintained, and that each jurisdiction in the region receive an allocation of units for low- and very low-income households."

Sonoma County General Plan

California ~~Code –~~ Government Code Section 65580 declares that local and state governments have a responsibility to facilitate housing development and to make "adequate provision for the housing needs of all economic segments of the community." The Housing Element of the General Plan presents goals, objectives, policies, and supporting information related to the provision of housing for existing and future residents of the County, including low income housing. The Housing Element policies promote housing consistent with the various designations set forth in the Land Use Element. Of the six listed goals listed in the Housing Element, the first four are concerned with affordable housing (Sonoma County, 2014). The County is currently in the process of updating the General Plan, including the Housing Element.

City of Rohnert Park General Plan, RHNA, NWSP, and WDSP

The City of Rohnert Park General Plan 2020 provides a comprehensive long-term plan for the physical development and growth of the City. Chapter 2 addresses Land Use and Growth Management. Chapter 5 addresses Open Space, Parks, and Public Facilities. Chapter 9 addresses Housing. Goal GM-B states that the City shall undertake efforts to facilitate the provision of affordable housing by exempting it from "trigger cap" restrictions. Chapter 9.1 states: ~~that~~ "The City currently requires that the equivalent of 15 percent of all new ownership units is affordable." Development goals are intended to maintain community character and limit urbanization of open space outside the City.

The Regional Housing Needs Allocation (RHNA) process identifies the total number of housing units, separated into four affordability levels, that every local government in the Bay Area must plan to accommodate for the period from 2023 to 2031. The primary role of the RHNA methodology is to encourage a pattern of housing growth for the Bay Area that meets the needs of all residents (Association of Bay Area Governments, 2022). The RHNA for Sonoma County and Rohnert Park~~,~~ illustrate the state's regulatory mandate for the unincorporated portions of the County and City to increase the available housing stock. The City and County's adopted RHNA is presented below, by income category.

TABLE 4.11-1
RHNA – UNINCORPORATED COUNTY AND R0HNERT PARK

Jurisdiction	Very Low-Income Units	Low Income Units	Moderate Income Units	Above Moderate-Income Units	TOTAL
Unincorporated Sonoma County	1,024	584	627	1,589	3,824
City of Rohnert Park	399	230	265	686	1,580
	1,420	814	892	2,275	5,404

SOURCE: City of Rohnert Park Comment Letter, dated January 31, 2023, and Association of Bay Area Governments, 2022.

The Northwest Specific Plan area is immediately east of the Resort. The Northwest Specific Plan provides development standards that regulate new development concerning height, building setbacks, parking requirements, and other development features.

4.11.2 ENVIRONMENTAL SETTING

Population

Nearby off-reservation communities include the City of Rohnert Park, Sebastopol, Cotati, and Santa Rosa. **Table 4.11-~~1~~2** shows regional populations. As shown in **Table 4.11-~~1~~2**, a large proportion of the regional population resides in unincorporated Sonoma County, with the City of Santa Rosa ranking as the largest city, more than double the population of the next largest city.

The population of Sonoma County grew from 458,614 in 2000 to an estimated 484,674 in 2021, a 5.7 percent increase. Rohnert Park's population increased 4.9 percent between 2000 and 2021. The population of Sebastopol decreased approximately 3.3 percent between 2000 and 2021. The population of Cotati increased 16.1 percent, a faster rate than Sonoma County as a whole. The unincorporated Sonoma County population decreased 12.9 percent, with much of this decrease occurring during the past six years. This decrease is substantially greater than any of the percentage changes of incorporated cities listed in **Table 4.11-~~1~~2**. Some of the decrease in the unincorporated County may be due to recent wildfires, including the 2017 Tubbs Fire and the 2019 Kincade Fire.

Employment

Table 4.11-~~2~~3 displays labor force participation and employment information for Sonoma County, Rohnert Park, and the State of California. The labor force is defined as the number of members of a population who are able to work.

TABLE 4.11-~~1~~2
REGIONAL POPULATIONS

Location	Population		
	2000 (1)	**2015 (2)**	**2021 (3)**
Sonoma County (Total)	458,614	494,431	484,674
Cloverdale	6,831	8,858	9,029
Cotati	6,471	7,399	7,512
Healdsburg	10,722	11,681	11,174
Petaluma	54,548	59,322	59,756
Rohnert Park	42,236	41,967	44,287
Santa Rosa	147,595	171,827	177,396
Sebastopol	7,774	7,490	7,520
Sonoma	9,128	11,202	10,755
Windsor	22,744	27,221	26,134
Unincorporated County	150,565	147,464	131,111
State of California (Total)	33,871,648	39,255,883	39,303,157

1. AES, 2018b.
2. Sonoma County Economic Development Board, 2016.
3. California Department of Finance, 2022. Estimates are as of January 1, 2021.

TABLE 4.11-~~2~~3
2021 LABOR FORCE PARTICIPATION AND UNEMPLOYMENT RATES

Location	Labor Force (1)	Labor Force Participation Rate (2)	Unemployment Rate (1)
Sonoma County	241,400	64.8%	5.5%
Rohnert Park	22,100	70.6%	NA
San Francisco MSA	909,800	70.0%	5.2%
State of California	18,913,400	63.3%	7.6%

1. California Economic Development Department, 2022; with the exception of Rohnert Park Labor Force. Rohnert Park Labor Force calculated by AES-Montrose, assuming that Labor Force is 50% of the city population listed in **Table 4.11-~~1~~2**. A 50% figure was used because this is the ratio of Labor Force to Population for Sonoma County, as shown in Table **4.11-~~1~~2** and **4.11-~~2~~3**. Rohnert Park Unemployment Rate was not readily located online, and thus is listed as NA. However, the Rohnert Park unemployment rate is likely similar to the Sonoma County unemployment rate.
2. U.S. Census Bureau, 2021a; 2021b. AES-Montrose calculated a weighted average Participation Rate for the San Francisco MSA, using data obtained from 2021c. Average was weighted by the size of the populations of San Francisco and San Mateo Counties (52.5% and 47.5%, respectively).

A portion of the labor force in Sonoma County commutes to jobs in the San Francisco Bay Area. Sonoma County had a labor force of 241,400 in 2021, with a labor force participation rate of approximately 65 percent of the total working-age population. Unemployment rates are relatively low throughout the region. The May 2021 unemployment rates in Sonoma County and the San Francisco MSA (defined as the metropolitan statistical area of the combined counties of San Francisco and San Mateo) were 5.5 percent and 5.2 percent, respectively. This compares to the California unemployment rate of approximately 7.6 percent.

TABLE 4.11-~~3~~4
2021 EMPLOYMENT BY INDUSTRY

Industry	Sonoma County		San Francisco MSA		California	
	Number Employed	**Percent of Total**	**Number Employed**	**Percent of Total**	**Number Employed**	**Percent of Total**
Total, All Industries	200,600	100.0%	1,078,600	100.0%	17,031,700	100.0%
Total Farm	6,600	3.3%	1,700	0.2%	402,900	2.4%
Total Non-farm	194,000	96.7%	1076,900	99.8%	16,628,800	97.6%
Goods Producing	38,700	19.3%	77,900	7.2%	2,175,600	12.8%
Mining, Logging, and Construction	16,200	8.1%	41,300	3.8%	903,000	5.3%
Manufacturing	22,500	11.2%	36,600	3.4%	1,272,600	7.5%
Service Providing	155,300	77.4%	999,000	92.6%	14,453,200	84.9%
Trade, Transportation, and Utilities	34,800	17.3%	132,500	12.3%	3,020,600	17.7%
Information	2,500	1.2%	110,100	10.2%	564,100	3.3%
Financial Activities	7,500	3.7%	81,800	7.6%	823,100	4.8%
Professional and Business Services	23,500	11.7%	278,900	25.9%	2,698,800	15.8%
Educational and Health Services	34,000	16.9%	145,200	13.5%	2,799,000	16.4%
Leisure and Hospitality	21,000	10.5%	87,300	8.1%	1,600,500	9.4%
Other Services	6,400	3.2%	33,300	3.1%	499,000	2.9%
Government	25,600	12.8%	129,900	12.0%	2,448,100	14.4%

Percentages may not add to 100% due to rounding. County data is not seasonally adjusted. California data is seasonally adjusted.
SOURCE: California Economic Development Department, 2022.

Unemployment rates have declined since May 2021. March 2022 unemployment rates for Sonoma County, the San Francisco MSA and the State of California were 3.0 percent, 2.4 percent, and 4.3 percent, respectively (California Economic Development Department, 2022). As shown in **Table 4.11-~~3~~4,** Sonoma County employment by industry is similar to that for the State of California. The existing Resort currently employs approximately 2,000 persons (Press Democrat, 2021).

Income

Table 4.11-~~4~~5 displays income and poverty data for Sonoma County, San Francisco MSA, and the State of California. Median household income of the San Francisco MSA is significantly higher than that of Sonoma County and the State of California.

TABLE 4.11-~~4~~5
2016-2020 REGIONAL INCOME AND POVERTY

	Median Household Income	Persons in Poverty
Sonoma County	$86,173	7.8%
Rohnert Park	$77,831	10.2%
San Francisco MSA	$123,400	7.9%
State of California	$78,672	11.5%

SOURCE: U.S. Census Bureau, 2021a; 2021b. Weighted averages for the San Francisco MSA were calculated using data obtained from U.S. Census Bureau 2021c. Average was weighted by the size of the populations of San Francisco and San Mateo Counties (52.5% and 47.5%, respectively).
Note: The U.S. Census Bureau calculates income and poverty level based on multi-year data (2016-2020).

Housing

As shown in **Table 4.11-~~5~~6**, there were approximately 205,200 housing units in Sonoma County as of January 1, 2021. Of these regional housing units, an estimated 17,240 were vacant. As shown in **Table 4.11-~~6~~7**, approximately 8.4 percent of housing was vacant in Sonoma County in 2021 and 2022.

TABLE 4.11-~~5~~6
2021 REGIONAL HOUSING ESTIMATES

Location	Total Housing Units (1)	Percent Vacant (1)	Estimated Vacant Units (2)
Sonoma County (Total)	**205,236**	**8.4%**	**17,240**
Cloverdale	3,550	4.5%	160
Cotati	3,215	4.3%	138
Healdsburg	5,062	11.3%	572
Petaluma	24,097	3.4%	819
Rohnert Park	17,915	5.1%	914
Santa Rosa	70,563	5.1%	3,599
Sebastopol	3,566	3.9%	139
Sonoma	5,649	11.9%	672
Windsor	9,691	5.2%	504
Unincorporated County	61,928	15.6%	9,661

1. California Department of Finance, 2022. Estimates are as of January 1, 2021.
2. Calculated by AES-Montrose based on total housing units and vacancy rate.

TABLE 4.11-~~6~~7
HOUSING VACANCY RATES

Location	Housing Vacancy Rate (Percent)					
	2017	2018	2019	2020	2021	2022
Sonoma County	9.1%	9.1%	9.1%	8.3%	8.4%	8.4%
Cloverdale	6.2%	6.6%	6.6%	4.5%	4.5%	4.5%
Cotati	4.9%	4.3%	4.3%	3.7%	4.3%	4.3%
Healdsburg	8.2%	8.4%	8.4%	10.5%	11.3%	11.3%
Petaluma	4.1%	4.3%	4.3%	3.6%	3.4%	3.4%
Rohnert Park	3.9%	4.2%	4.2%	5.3%	5.1%	5.1%
Santa Rosa	5.4%	5.7%	5.7%	4.9%	5.1%	5.1%
Sebastopol	5.0%	5.2%	5.2%	4.2%	3.9%	3.9%
Sonoma	10.2%	9.9%	9.9%	11.9%	11.9%	11.9%
Windsor	5.9%	6.2%	6.2%	5.2%	5.2%	5.2%
Unincorporated County	16.9%	16.6%	16.6%	15.5%	15.6%	15.6%

SOURCE: California Department of Finance, 2022. Estimates for each year are as of January 1.

The U.S. Census American Community Survey also publishes data on housing and vacancy, which can be found in Table DP04, Selected Housing Characteristics. Although U.S. Census Table DP04 does not list data for individual Sonoma County cities, it does state that 2021 Sonoma County housing units and vacant units were approximately 205,136 and 16,295, respectively.

These figures are similar to those listed in **Table 4.11-6** and **Table 4.11-7**. However, the U.S. Census Bureau publishes a vacancy rate that is "net" of units that are vacant for seasonal reasons and some other categories of vacant units, and therefore results in more conservative (lower) numbers compared to the California Department of Finance figures. Table DP04 lists a Sonoma County homeowner vacancy rate of 0.5 percent and a rental vacancy rate of 3.0 percent, which are "net" of seasonality and certain other categories (U.S. Census Bureau, 2021d). If these lower vacancy rates are multiplied by the relative mix of owner-occupied homes (55 percent) and rental homes (45 percent) in U.S. Census Table DP04, an overall vacancy rate of 1.6 percent is calculated. Multiplying 1.6 percent by the 205,236 Sonoma County homes yields an estimated 3,300 net vacant units.

The ~~I~~information above on regional population and housing was obtained from governmental agencies and census data. Agency websites consulted include the U.S. Census Bureau, California Department of Finance, and the California Employment Development Department.

4.11.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by Section XIII of the Checklist (**Appendix A**) and have been used in this section to evaluate potential off-reservation impacts of the Proposed Project to off-reservation population and housing. Such impacts are considered significant if they would:

- Induce substantial off-reservation population growth; or
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere off-reservation.

Impact 4.11-1: The Proposed Project could induce substantial off-reservation population growth.

The Proposed Project would be a source of temporary employment during construction. The majority of workers are expected to reside locally or stay at regional hotels. Construction of the Proposed Project would generate approximately 2,000 jobs (**Section 3.3**), although these employment positions would not occur simultaneously, as construction will be phased. Operation of the Proposed Project would occur once construction is largely complete, and would employ approximately 500 to 600 additional staff on a part-time to full-time basis (**Section 3.3**). This equates to a 25 percent to 30 percent increase from the estimated 2,000 persons who currently work at the Resort.

The average 2022 unemployment rate for Sonoma County is approximately 3.0 percent or 7,500 persons (California Economic Development Department, 2022). Many or most operational employees would be comprised of permanent residents who currently live in Sonoma County. Many individuals seeking employment associated with the Proposed Project would likely be unemployed or underemployed. Although it is anticipated that the majority of the 500 to 600 employees would already reside locally, there is room for accommodation to the extent that some relocation occurs. The anticipated number of employees constitutes approximately 0.1 percent of the population of Sonoma County. The Proposed Project would not induce substantial population growth in the region of the project site.

There would be a less-than-significant impact.

Impact 4.11-2: The Proposed Project could displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere off-reservation.

The Proposed Project does not include the construction, demolition, or displacement of housing. It is expected that most of the approximately 500 to 600 employees for the operation of the Proposed Project already reside in Sonoma County. Some number of employees may commute to work from outside of Sonoma County, especially during construction of the Proposed Project, although construction would be temporary. However, some individuals may permanently relocate to the area to reduce the amount of time spent commuting. ~~As indicated in **Table 4.11-5**, there are approximately 17,240 vacant housing units in Sonoma County. Even if up to 50 percent of the anticipated 600 employees (conservative estimate) were to relocate to the County, and each occupies a vacant housing unit, such relocations would absorb less than 2 percent of the vacant housing stock.~~ A 2019 survey found that 26 percent of employees at a casino in Massachusetts had either relocated to the area, or were planning to do so (University of Massachusetts, 2020). The 2019 unemployment rate in the Springfield Massachusetts area was 3.9 percent (U.S. Bureau of Labor Statistics). This unemployment rate is lower than the Sonoma County 2021 unemployment rate of 5.5 percent listed in **Table 4.11-3**. (All other factors held equal, one would expect that a higher unemployment rate would translate into more local residents filling open job positions, and therefore fewer people in-migrating.) Multiplying the 500 – 600 employees by the estimated 26 percent of workers who in-migrate implies that approximately 130 to 156 workers would relocate to Sonoma County to fill open jobs. Furthermore, assuming an average 1.1 employees per household implies that the net housing demand would be 130 to 156 divided by 1.1 or 118 to 142 units. This equals 3.9 percent to 4.3 percent of the 3,300 "net" vacant units, using the U.S.

Census Bureau's more conservative definition of vacancy rate. Net housing demand would be between 0.7 percent to 0.8 percent of the vacant housing stock, using the less conservative vacancy definition of the California Department of Finance.

A portion of these employees may be considered low income, but they would not necessitate the construction of new affordable housing. Additionally, the Tribe has existing agreements with the City and County that address impacts to low income housing. According to the County 2012 IGA, the Tribe pays an annual Affordable Housing Fee of $210,000, which has been adjusted upward for inflation (Sonoma County, 2012b).

There would be a less-than-significant impact.

4.11.4 MITIGATION MEASURES

None.

4.12 PUBLIC SERVICES

This section discusses the off-reservation environment associated with public services and evaluates potential impacts of the Proposed Project on off-reservation public services. The public services discussed in this section include fire protection, justice services (including law enforcement), parks, public schools, and other public facilities.

4.12.1 REGULATORY SETTING

State and Local

The project site is located on trust land and is not subject to state or local laws and regulations concerning off-reservation governmental facilities and public services. However, such laws and regulations apply to off-reservation areas and public service systems if implementation of the Proposed Project were to interfere with and/or increase or decrease the demand on certain public services.

Sonoma County General Plan

The Public Safety Element provides information concerning the protection of the community from unreasonable risks and discusses public services related to the physical development of the County. Utilities and public services discussed in the element include water consumption, wastewater management, public education, parks and recreation, fire protection, solid waste management, utilities, and youth and family services.

City of Rohnert Park General Plan, NWSP, and WDSP

The Open Space, Parks, and Public Facilities Element of the City's General Plan address the City's public resources and scenic settings and identifies city standards for these resources. Chapter 5 discusses parks and recreational facilities, schools, wastewater treatment facilities, water supply, and community services. The Health and Safety Element addresses emergency preparedness and assesses community protection from risks. The Northwest Specific Plan was adopted in 2014 and prepared consistent with the City's Municipal Code Chapter 17.06, Article VIII, Sections 17.06.290-450. Policies provide development standards concerning height, building setbacks, parking requirements, and changes in land use, and proposed utility infrastructure and improvements. The Specific Plan envisions a primarily mixed-use development with regional commercial and industrial uses. The Wilfred/Dowdell Village Specific Plan applies to approximately 20.19 acres generally south of Wilfred Avenue. The Specific Plan was approved by the City in 2008 and has a 2020 General Plan designation of Regional Commercial.

4.12.2 ENVIRONMENTAL SETTING

Law Enforcement, Fire Protection and Emergency Medical Services (EMS)

Pursuant to the Compact, the Tribe makes payments to the State Gaming Agency for deposit into the Graton Mitigation Fund. The quarterly payments are based primarily on the net win of the Resort. The Graton Mitigation Fund is the source of the Tribe's payments to the County and City, which are described below.

The Tribe entered into an Intergovernmental Mitigation Agreement (IGA) with the County to provide justice services (including law enforcement), and fire and emergency medical response services to the reservation (Sonoma County, 2012b). The County and the Tribe amended the IGA in 2019 to adjust for a proposed 200-room hotel expansion (Sonoma County, 2019b).

Pursuant to Section 3(g) of the amended IGA, the Transit Occupancy Tax (TOT) would have increased commensurate with the number of proposed hotel rooms. As noted in **Section 2.0**, this project was not constructed.

As described in Section 1.0 of the 2012 IGA, “Fire Districts” were defined as the Sonoma County Central Fire Authority, which served the Rincon Valley and Windsor Fire Protection Districts, the Rancho Adobe Fire Protection District of Sonoma County, the City of Rohnert Park Department of Public Safety, and the County fire services. The unincorporated areas in the vicinity of the reservation are now within the service area of the Sonoma County Fire District (SCFD) after the former Rincon Valley Fire Protection District was consolidated with other local fire districts in 2019 (Sonoma County Fire District, 2019). The SCFD responds to both fire and medical emergency incidents in the unincorporated areas between Santa Rosa and the City. SCFD operates 11 fire stations. The nearest station to the reservation is approximately two miles north and located at 207 Todd Road, in Santa Rosa (Sonoma County Fire District, 2022a). Additionally, the BIA has an agreement with CalFire to serve trust land in California.

The SCFD also subcontracts some EMS services to ambulance companies. In the past, American Medical Response (AMR) has maintained a paramedic-staffed advanced life support ambulance in the vicinity of the Project Site. SCFD has recently published a Request for Proposal for ambulance services.

The Tribe has also entered into a Memorandum of Understanding (MOU) with the City and provides annual payments to compensate for increases in demand on local public safety services due to Resort activity (City of Rohnert Park, 2013). The Rohnert Park Department of Public Safety provides 24-hour police, fire, and medical services to off-reservation areas of the City of Rohnert Park, but not to the Resort.

Recurring mitigation payments to the City and County are summarized in **Table 4.12-1**. ~~Note that the payment amounts listed in this table are as of when the County IGA and City MOU were entered into in 2012 and 2013, respectively. As provided for in both of these agreements,~~ These recurring annual payments are adjusted for changes in the Consumer Price Index (CPI). Recurring mitigation payments that relate to law enforcement (included in the County’s Public Safety group of departments), fire and EMS are listed. Other mitigation payments are listed to provide context. The County has discretion regarding how to utilize some of the funds categorized as Community Benefit Programs.

Schools

Public school districts in the vicinity of the project site include the Cotati-Rohnert Park Unified School District, and the West Sonoma County Union High School District (SCOE, n.d.). Private schools in the vicinity of the project site include Montessori, Waldorf, Christian, Lutheran, and charter schools.

Parks

There are several parks in the vicinity of the project site, the majority of which occur within the City. These parks include family-oriented structures such as playground spaces and sport fields. Green spaces such as Robert’s Lake and the Southern Laguna Discovery Trail provide the public access to more natural areas in the vicinity of the project site.

Other Public Services

Other public services such as libraries are also available near the project site, largely within the City.

TABLE 4.12-1
SELECTED ANNUAL RECURRING MITIGATION PAYMENTS

Sonoma County (IGA)[1]	**Payment by the Tribe (2022-2023)**
Law Enforcement and Public Safety (3(a))	~~$3,100,000~~ $4,116,160
Health, Human Services & Socioeconomic (3(b))	~~$600,000~~ $796,676
Development and Mitigation Fees	
Traffic Development Fee (3(c)(i))	~~$690,000~~ $916,178
Affordable Housing Fee (3(c)(i)i)	~~$210,000~~ $278,837
Greenhouse Gas, PM10, and ROG (3(c)(iii))	~~$890,000~~ $1,181,737
Fire & Emergency Services (3(d))	~~$1,000,000~~ $1,327,794
Crime Impact Mitigation to Cities (3(e))	~~$416,918~~ $553,581
Transit Occupancy Tax in Lieu (3(f))	$929,456 ~~$700,000~~
Local Road Maintenance (3(g))	~~$500,000~~ $663,897
Highway 101 and Arterial and Collector Imp (3(h))	~~$2,000,000~~ $2,655,588
Conjunctive Use / Water Conservation (3(i))	~~$275,000~~ $365,143
Subtotal	~~$10,381,918~~ $13,785,047
Community Benefit Programs (4)	~~$50,000,000 +/-~~ $1,000,000
City of Rohnert Park (MOU)[2]	
Law Enforcement (3.1)	~~$500,000~~ $663,897
Problem Gambling Recurring Contribution (3.2)	~~$125,000~~ $165,974
Waterway Recurring Contribution (3.3)	~~$50,000~~ $66,390
Supplemental Recurring Contributions	
Supplemental Recurring Contribution (3.4.1)	~~$5,000,000~~ $6,638,970
Recurring Public Services Contribution (3.4.2)	~~$2,369,000~~ $3,145,544
School Contribution (4.1)	~~$1,000,000~~ $1,327,794
Charitable Contributions	
Rohnert Park Foundation (4.2.1)	~~$1,000,000~~ $1,327,794
Other (4.2.2)	~~$1,000,000~~ $1,327,794
Community Contribution (4.3)	~~$1,000,000~~ $1,327,794
Subtotal	~~$12,044,000~~ $15,991,951
Total	~~22,425,918 +~~ $30,776,998 ~~50,000,000 +/-~~

[1] SOURCE: Sonoma County, 2012~~. R~~ (relevant sections from this agreement are noted in parenthesis) and Tribe, 2023.
[2] SOURCE: City of Rohnert Park, 2013~~. R~~ (relevant sections from this agreement are noted in parenthesis) and Tribe, 2023.

4.12.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by Section XIV of the Checklist (**Appendix A**) and have been used in this section to evaluate potential off-reservation impacts of the Proposed Project to off-reservation public services. An impact is considered significant if it would:

- Result in substantial adverse physical off-reservation impacts associated with the provision of new or physically altered off-reservation governmental facilities, the construction of which could cause significant off-reservation environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, or other off-reservation public facilities.

Methodology

Existing law enforcement, fire, and emergency services were assessed and compared to the foreseeable increase in demand attributable to the Proposed Project.

Impact 4.12-1: The Proposed Project could result in substantial adverse physical impacts associated with the provision of new or physically altered off-reservation governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the off-reservation public services.

Fire Protection and EMS

Construction and operation of the Proposed Project would occur within the reservation boundaries. Fire protection services would be provided by the SCFD and the potential for impacts to result in new or expanded facilities would generally be limited to County facilities. Equipment used during construction of the Proposed Project has the potential to create sparks and flames, however, the project site is currently paved and is not highly susceptible to wildfires. Therefore, the Proposed Project would have minimal risk of sparks igniting vegetation. Risks associated with wildland fires are addressed in **Section 4.7**. Potential calls for EMS generated by construction accidents would be temporary and minimal, and would be similar to demands placed by other construction projects in the vicinity.

The operational demand for fire and EMS services would be expected to increase in proportion to the increase in Resort patronage. **Table 4.12-2** shows existing and estimated future traffic volumes to the Resort. As shown in the table, traffic volumes are anticipated to increase by approximately 51 percent. This is assumed to be roughly proportional to the increase in Resort patronage that would be attributable to the Proposed Project. By expanding the size of the Resort, the Proposed Project would increase the risk of fire and the frequency of fire protection calls for service (CFS). The Proposed Project would adhere to applicable Tribal codes and Section 6.4.2 of the Compact, which are comparable to the California Building and Public Safety Codes applicable to the County (Compact, 2012). Applicable fire protection features would be incorporated into the design of the Proposed Project, including BMPs identified in **Section 3.2.3**. Total SCFD expenditures for Fiscal Year 2022/2023 are budgeted at $31,859,800 (Sonoma County Fire District, 2022b). The majority of budgeted SCFD revenues ($19,032,000) will be sourced from taxes. Ambulance Billings are anticipated to provide an additional $4,660,000 of Fiscal Year 2022/2023 budgeted revenues.

Approximately 93 percent of this impact would categorized as an increase in operational expenditures and debt service, with the remaining 7 percent attributable to capital expenditures. Because capital expenditures are typically high dollar items, actual capital expenditures would vary considerably from year-to-year. The Tribe has existing agreements with the City and County that address fire /EMS services to the Resort (see **Table 4.12-1**). These agreements would apply to the operation of the Proposed Project. The Tribe would amend existing agreements with fire protection/EMS providers to account for the increased financial impact of the Proposed Project via implementation of Mitigation Measure 4.12-1.

At these demand levels, the Proposed Project would not generate the need for existing infrastructure to be expanded or entirely new facilities to be built.

TABLE 4.12-2
ESTIMATED TRAFFIC TRIPS

Project Component	Daily Total
Existing Resort[1]	
Casino	17,744
Hotel (net of 2/3rds internal reduction)	817
Baseline	**18,261**
Proposed Project	
Gaming floor expansion (approximately 86,078 sq. ft.)[2]	8,454
Hotel (net of internal reduction)[2]	663
Theater[3]	138
Total net trips	**9,255**
Expansion as a percent of baseline	**51%**

[1] SOURCE: 2009 FEIS, page 4.8-19, FEIS Appendix O, page 55.
Note that numbers in column do not add to 18,261.
[2] SOURCE: **Appendix G**
[3] SOURCE: **Appendix G**. Assumes 1 sold-out event every other week at 1,288 trips and 13 days of 50 trips per day.

The Tribe tracks SCFD calls for service to the Resort. This data indicates that there were 949 SCFD CFS during the period of January 1, 2018 through December 31, 2022 (Tribe, 2023). That equates to an average of 202 CFS per year (adjusting for the 2020 COVID closure, during which CFS were abnormally low). **Table 4.12-3** estimates CFS of the Proposed Project.

TABLE 4.12-3
ESTIMATED SCFD FIRE AND EMS IMPACT

Impact Metric	Value
Calls for Service Calculations	
~~Estimated existing daily CFS at Resort[1]~~	~~0.90~~
~~Days per year~~	~~365~~
Estimated annual calls for service (CFS), baseline[1]	~~329~~ 202
Expansion as a percent of baseline	51%
Estimated CFS attributed to Proposed Project	**~~168~~ 103**

[1] SOURCE: Tribe, 2023. ~~Estimate based on Press Democrat, 2014.~~

SCFD reported a total of 11,894 CFS during calendar year 2022. Based on the Fiscal Year 2022/2023 Budget (Sonoma County Fire District, 2022b), this implies an average cost of $2,679 per CFS, or $2,287 per CFS, taking into account ambulance- billings. As described in **Table 4.12-3**, fire and EMS CFS attributable to the Proposed Project are estimated at 96 per year. Thus, multiplying $2,287 per CFS x 103 CFS implies that the annual fire/EMS cost (net of recoveries from ambulance billings) would be approximately $236,000. This estimate relies upon a number of assumptions, including:

1. The definition of a CFS by SCFD and the Tribe are the same or very similar (i.e., the CFS data provided by SCFD and the Tribe are consistent).
2. The fire versus EMS mix of Proposed Project CFS is the same as or very similar to the overall SCFD fire/EMS mix. Similarly, the severity or intensity of Proposed Project CFS are the same as or very similar to the average SCFD CFS.
3. Net ambulance billings and recoveries for CFS that occur at the Proposed Project are the same as or very similar to ambulance billings and recoveries for the average SCFD CFS.

It is noted that the $1,327,794 County Fire/EMS mitigation payments for the existing Resort (**Table 4.12-1**) are higher than what is implied by the above impact analysis. Specifically, multiplying $2,287 per CFS x an estimated 202 CFS implies an estimated $462,000 in annual County Fire/EMS utilization for the existing Resort. This calculation for the existing Resort is subject to the methodology and assumptions described above.

There would be a less-than significant impact with mitigation.

Police Protection

Police protection and response at the Resort is primarily provided by the Sonoma County Sheriff’s office. The City of Rohnert Park Department of Public Safety provides back-up police serves to the Resort and primary police serves within the adjacent City. The Proposed Project would therefore primarily affect the Sheriff’s Department. Construction activities related to the Proposed Project would be temporary and similar to other construction projects in the vicinity, and would not generate significant CFS for police. Construction activity therefore would not trigger a need to construct new or expanded facilities.

Operation of the Proposed Project is anticipated to increase patronage at the Resort. The increase in patronage would result in a roughly proportionate increase in demand for law enforcement and other justice services. As described in the County IGA Section 3.(a), “law, justice, and public safety may include payments to the Sonoma County Sheriff’s Department, Office of the District Attorney, Office of the Public Defender, Probation Department, and other County public safety providers”. The County budget categorizes these offices as Justice Services. **Table 4.12-4** summarizes the Fiscal Year 2022/2023 Budget for these offices.

TABLE 4.12-4
DETAILED BREAKDOWN OF COUNTY JUSTICE SERVICES BUDGET – FISCAL YEAR 2022/2023

	General Fund[1]	**Total Expenditures (All Funds)[2]**
Justice Services:		
Probation	$36,226,832	$71,559,897
District Attorney's Office	$19,642,153	$31,850,588
Public Defender	$12,888,613	$14,006,698
Sheriff's Office	$103,660,198	$198,487,687
Total Justice Services	**$172,417,796**	**$315,904,870**

SOURCE: Recommended Budget Fiscal Years 2022-2023 (Sonoma County, 2022a)
[1] Amounts are departmental revenues, not expenditures. However, departmental revenues are usually similar to expenditures.
[2] Amounts are net of Internal Departmental Transfers, so as to net-out double counting.

As shown in **Table 4.12-4**, the Fiscal Year 2022/2023 Justice Services budget receives approximately $172.4 million from the General Fund. Total Justice Services expenditures are budgeted at $315.9 million.

The difference is comprised of funds received from other governmental agencies (the largest of which are the State of California and the U.S. Federal Government) and special purpose funds. Demands for public services would increase as a result of higher customer patronage and traffic. Consequently, the County and, to a lesser extent, the City would experience increased costs to provide these services. Financial impacts to a public services department incurred during a calendar or fiscal year have been calculated by estimating the approximate cost of each call for service (CFS) and multiplying that amount by the annual increase in CFS generated by the Proposed Project. The Sonoma County Sheriff's Office generates an Incident Report for each Incident. Incident Reports are defined as:

> Sheriff's incident reports are generated after either of two events 1) a citizen has reported an event/crime and a deputy has substantiated that a report is necessary or 2) a deputy has witnessed an event/crime in progress. These incident reports represent a wide spectrum of law enforcement activity from informational reports to serious crime reports…

Incidence data was obtained from the County Sheriff's Office (Sonoma County, ~~2022b~~2023). This database lists law enforcement incidents that were addressed by the County Sheriff's Office. Data is summarized in **Table 4.12-5.** Fiscal year 2015~~4~~ is the first year presented in the table because this is the first full year of operations~~when the Resort opened~~. Total Incidents for the County Sheriff's Office, including Incidents attributed to the Resort, are listed. Incidents that appear to be traffic stops on Wilfred Avenue and Golf Course Drive are excluded from Resort Incidents. The Resort closed for several months, beginning on March 16, 2020, due to COVID-19. As shown, the percentage of Sheriff's Office Incidents attributed to the Resort has been~~was~~ relatively consistent.~~ from Fiscal Year 2015 through the COVID-19 closure, at approximately 2.0 percent each year.~~

TABLE 4.12-5
SUMMARY OF SONOMA COUNTY SHERIFF INCIDENTS

Fiscal Year	Period	Total Incidents	Resort Incidents	Incident Rate
~~2014~~	~~7/1 - 11/4/13~~	~~4,951~~	~~0~~	~~N/A~~
	~~11/5 - 6/30/14~~	~~8,984~~	~~312~~	~~3.5%~~
2015	7/1 - 6/30/15	~~13,338~~13,351	~~290~~265	~~2.2%~~2.0%
2016	7/1 - 6/30/16	~~13,717~~13,726	~~267~~251	~~1.9%~~1.8%
2017	7/1 - 6/30/17	~~13,453~~13,463	~~255~~243	~~1.9%~~1.8%
2018	7/1 - 6/30/18	~~13,980~~13,991	~~304~~263	~~2.2%~~1.9%
2019	7/1 - 6/30/19	~~12,123~~12,132	~~255~~228	~~2.1%~~1.9%
2020	7/1 - 3/16/20	~~7,326~~7,339	~~141~~130	~~1.9%~~1.8%
	3/17 - 6/30/20	~~2,121~~2,123	~~5~~3	~~0.2%~~0.1%
2021	7/1 - 6/30/21	~~5,914~~5,920	~~26~~NA	~~0.4%~~NA
2022	7/1 - 6/30/22	~~4,986~~5,036	~~9~~NA	~~0.4%~~NA
2023	7/1-4/24/23	4,690	92	2.0%
			Average[1]	**~~2.0%~~1.9%**

SOURCE: Sonoma County Sheriff's Office Incident Data (Sonoma County, ~~2022b~~2023).
[1] Average of Fiscal Year 2015 through first 8.5 months of Fiscal Year 2020 and Fiscal Year 2023.

~~Subsequent to the Resort reopening, the incidence rate has declined substantially. However, the total number of incidents listed in the database also declined substantially, indicating that perhaps not all of the~~ The reporting of Fiscal Year 2021 and 2022 incidents do not appear to be wholly consistent with that of the other periods, and the Resort was closed in March of 2020 due to COVID.~~have yet been uploaded to the Sheriff database. For this reason~~ For these reasons, Fiscal Years beginning in 2015 and through March 16, 2020 and Fiscal Year 2023 are included in the calculation of the **Table 4.12-5** average Incident Rate.

~~Data for Fiscal Years 2021 and 2022 are not included in the calculation of average incident rate.~~ The data in **Table 4.12-5** use "Incidents" as the measurement of law enforcement usage, not "Calls for Service". **Table 4-12-6** estimates the law enforcement impact of the Proposed Project.

TABLE 4.12-6
ESTIMATED COUNTY LAW ENFORCEMENT/PUBLIC SAFETY IMPACT

Incident Rate Metric	Value
Existing Resort Incident Rate (**Table 4.12-5**)	2.0%
Expansion as a percent of baseline (**Table 4.12-2**)	51%
Proposed Project Anticipated Incident Rate	1.02%

The fiscal impact of the Proposed Project would comprise a relatively small percentage of the County ~~CFS, at approximately~~ at an estimated 1.02 percent (**Table 4.12-6)**. As indicated in **Table 4.12-4**, the County anticipates spending a total of $315,904,870 during Fiscal Year 2022/2023 for Justice Services, including law enforcement. Of this amount, an estimated $172,417,796 would be provided by the General Fund, with the remainder funded from other sources. Note that unlike the Fire/EMS section above, this section does not include a calculation of estimated law enforcement / public safety impacts, because of two issues:

1. It appears that a substantial portion of the dollar figures in **Table 4.12-4** do not correspond to the services depicted in **Table 4.12-5**. For example, as shown in **Table 4.12-4**, $99,157,741 of the $198,487,687 budgeted for the Sheriff's Office is allocated to "Law Enforcement." However, the Sherriff's Office budget also includes $84,574,073 for "Detentions" or the operation of the County's correctional facilities. Persons who are thus housed are there not only because of law enforcement activities that occur in unincorporated Sonoma County (i.e., are stimulated by Sonoma County Sheriff Law Enforcement), but also because of activities by police departments of incorporated cities. Similarly, the County's Probation, District Attorney's Office and Public Defender address offences that occur in both unincorporated Sonoma County and by the activities of city police departments. Thus, multiplying the 1.9% in **Table 4.12-5** by the dollars in **Table 4.12-4** would likely overestimate dollar impacts, because the denominator in the 1.9% calculation is based only on law enforcement incidents that occur in unincorporated Sonoma County, plus the town of Windsor. The percentage would be lower if it included law enforcement incidents that occur in Sonoma County cities.
2. There are two columns of figures depicted in **Table 4.12-4**. Differences between the columns are caused, in part, because the County is providing services on behalf of other governmental agencies (e.g., the State of California) and because of restricted funds. It is not clear whether the mix of services that would be impacted by the Proposed Project are only those funded by the General Fund (the first column), those funded by all revenue sources (the second column), or some level in between.

As discussed above, the Proposed Project would impact the City to a lesser extent than the County. The Tribe has existing agreements with the City and County that address police/law enforcement services to the Resort (**Table 4.12-1**). These agreements would apply to the operation of the Proposed Project. The Tribe would continue to pay annual fees for justice services, including law enforcement (Compact, 2012). The Tribe would amend existing agreements with police service providers to account for the increased financial impact of the Proposed Project via implementation of Mitigation Measure 4.12-1. At these demand levels, the Proposed Project would not generate the need for existing infrastructure to be expanded or entirely new facilities to be built.

There would be a less-than significant impact with mitigation.

Schools, Parks, and Other Public Facilities

The closest school, Pathways Charter School, is located approximately 0.65 miles west of the project site on Professional Center Drive. As discussed in **Section 4.11**, the Proposed Project would result in a less-than-significant impact to regional population growth.

However, some individuals would likely permanently relocate to the area to reduce the amount of time spent commuting. As described in **Section 4.11**, it is estimated that the Proposed Project would stimulate housing demand of approximately 118 to 142 units. There are an estimated 205,236~~With approximately 17,240 vacant~~ housing units in Sonoma County (**Table 4.11-5**).

Thus, assuming that school age children are evenly distributed among the housing stock and assuming one K-12 child per in-migrating household, the Proposed Project would stimulate approximately 118 to 142 units divided by 205,235 units or less than 0.1 percent of current school enrollment. ~~, even if up to 50 percent of the anticipated 600 employees (conservative estimate) were to relocate to the County, and each occupies a vacant housing unit, such relocations would absorb less than 2 percent of the vacant housing stock.~~ Therefore, construction of new or expanded schools, parks, and other public facilities would not be necessary.

There would be a less-than significant impact.

4.12.4 Mitigation Measures

4.12-1 The Tribe will amend existing agreements with public service providers, including the City and County, to address proportional impacts of the Proposed Project.

4.13 TRANSPORTATION AND TRAFFIC

This section discusses the off-reservation environment associated with transportation and traffic, assesses potential impacts associated with off-reservation transportation and traffic, and, if warranted, recommends mitigation measures to reduce potentially significant off-reservation impacts. A detailed Traffic Impact Study (TIS) for the Proposed Project is included as **Appendix G.**

4.13.1 REGULATORY SETTING

The off-reservation roadway network in the vicinity of the project site falls under the jurisdiction of the California Department of Transportation (Caltrans), Sonoma County (County), the Sonoma County Transportation Authority (SCTA), and the City of Rohnert Park (City).

State and Local

The project site is located on trust land and is not subject to State or local laws and regulations. However, such laws and regulations apply to off-reservation roadways in the vicinity of the project site.

California Department of Transportation

Caltrans manages interregional transportation, including the management and construction of the California highway system. In addition, Caltrans is responsible for the permitting and regulation of state roadways. The area surrounding the Proposed Project is located in Caltrans District 4 and includes two major roadways that fall under Caltrans' jurisdiction; U.S. Highway 101 (US 101) and State Route 116 (SR 116).

Association of Bay Area Governments

The Association of Bay Area Governments (ABAG) is a regional planning agency that encompasses nine counties surrounding the San Francisco Bay Area, including Sonoma County. The State of California passed Senate Bill 375 in 2008, which required each region to set specific targets for reducing greenhouse gas emissions emitted by driving and create a Sustainable Communities Strategy that outlines transportation, land use, and housing policies and investments that will achieve the emissions targets. Plan Bay Area 2050 is ABAG's Regional Transportation Plan (RTP) and Sustainable Communities Strategy (ABAG, 2021). Plan Bay Area 2050 has three major transportation goals: maintain and optimize the existing system, create healthy and safe streets, and build a next generation transit network. Methods to achieve these goals include identifying new maintenance funding sources, promoting micro-mobility transit such as bicycles to reduce vehicle trips, and improve the capacity and reliability of public transport.

Sonoma County Transportation Authority

SCTA acts as the County-wide planning and programming agency for transportation. SCTA was formed in 1990 and serves as the coordinating and advocacy agency for transportation funding for the County. Since 2004, "Measure M" funds generated within the County through a local sales tax have been used toward transportation projects and roadway improvements within the County. SCTA partners with other agencies to improve transportation in the County, including US 101, local roadways, public transit, and bicycle and pedestrian facilities. Joint planning by the City and the County through SCTA has resulted in improvements to US 101, including additional High Occupancy Vehicle lanes.

Sonoma County General Plan

The Sonoma County General Plan (2020) is the guiding document for development in the unincorporated areas of the County, which include a portion of off-reservation properties in the vicinity of the project site. The Circulation and Transit Element addresses the location and extent of planned transportation routes and includes goals, objectives, and policies affecting the mobility of future residents, businesses, and visitors. The Circulation and Transit Element is correlated with the Land Use Element to assure that the transportation system serves future travel demand and helps attain the desired land use plan.

City of Rohnert Park General Plan, NWSP, and WDSP

The Rohnert Park General Plan is the guiding document for development within City limits and the Sphere of Influence, which includes a portion of properties in the off-reservation vicinity of the Proposed Project. Section 4.0 includes the Transportation Element, which identifies future circulation needs for long-term planning. The Transportation Element addresses issues from City-wide to neighborhood scales in regards to traffic. As part of the City's Capital Improvement Program, identified improvements will be studied in greater detail, and funding and implementation sources will be determined. The Northwest Specific Plan area is immediately east of the Graton Resort and Casino. The Northwest Specific Plan provides development standards that regulate new development concerning height, building setbacks, parking requirements, and other development features.

4.13.2 ENVIRONMENTAL SETTING

Transportation Study Area

Project site access and internal circulation would be provided by the Resort's existing access and internal driveways. As part of the Proposed Project, Labath Avenue within the parking lot of the Resort would be minorly realigned.

Major off-reservation roadways in the vicinity of the project site include a state route, an interstate route, and various roadways. Identification of the off-reservation roadway intersections and segments included in the Transportation Study Area (TSA) was based on relevance and proximity to the project site (**Appendix G**). Intersections and roads within the TSA include:

- Wilfred Avenue/Stony Point Road
- Wilfred Avenue/Langner Avenue/Graton Casino
- Wilfred Drive/Golf Course Drive/Labath Avenue
- Golf Course Drive/Redwood Drive
- Golf Course Drive /US 101 Southbound Ramps
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US 101 Northbound Ramps
- Business Park Drive/Labath Avenue
- Business Park Drive/Casino Access
- Business Park Drive/Redwood Drive
- Rohnert Park Expressway/Redwood Drive

The following is a description of the TSA roadways and intersections that provide access to the project site.

U.S. Highway 101

US 101 runs north to south through the states of California, Oregon, and Washington. The portion of US 101 through Sonoma County was constructed between 1954 and 1962 and is the primary north to south corridor through the County. Upon entering Sonoma County, US 101 is a four-lane highway until Petaluma, where it resumes freeway status and eventually transitions to six-lanes between Petaluma and Windsor, passing through Cotati, Rohnert Park, and Santa Rosa.

State Route 116

SR 116 is a California State Highway in Sonoma County. SR 116 runs from State Route 1 (SR 1) on the Pacific coast near Jenner to State Route 121 south of Sonoma County.

Business Park Drive

Business Park Drive is a two-lane roadway that extends east from Labath Avenue to terminate at Redwood Drive. The posted speed limit is 25 miles per hour (mph).

Commerce Boulevard

Commerce Boulevard is a north to south major arterial that extends from SR 116 to Redwood Drive north of Golf Course Drive. The posted speed limit is 40 mph.

Dowdell Avenue

Dowdell Avenue has a 40-foot paved width with sidewalk on the east side of the street between Millbrae Avenue and approximately 375 feet north of Golf Course Drive West. Approaching Golf Course Drive West, Dowdell Avenue narrows to a configuration similar to Millbrae Avenue on the continuing segments to the south. The two-lane street segment is designated as a two-lane minor collector in the Rohnert Park 2020 General Plan. There is a City project in the approval phases that involves extending Dowdell Avenue south to connect to the southern segment of Dowdell Avenue at Business Park Drive, as specified in the Northwest Specific Plan.

Wilfred Avenue/Golf Course Dr.

Wilfred Avenue/Golf Course Drive is an east to west secondary arterial that connects the northeastern portions of Rohnert Park to US 101 and the western city limits. Golf Course Drive becomes Wilfred Avenue as it approaches the Resort from the City, thus the two roadways are used synonymously in some cases. The posted speed limit is 35 mph.

Labath Avenue

Labath Avenue is a north to south minor collector that becomes an access driveway to the Resort between Golf Course Drive and Business Park Drive. The posted speed limit is 35 mph.

Langner Avenue

Langner Avenue is a north to south local road that provides access to the Resort’s parking garage just south of Golf Course Drive. The posted speed limit is 30 mph.

Redwood Drive

Redwood Drive is a major arterial that extends from SR 116 to Millbrae Avenue. The posted speed limit is 40 mph.

Rohnert Park Expressway

The Rohnert Park Expressway is an east-west arterial roadway that extends from Stony Point Road on the west to terminate to the east at Petaluma Hill Road. Within the project site, it has a speed limit of 40 mph.

Stony Point Road

Stony Point Road is a north to south rural arterial running through Sonoma County. The posted speed limit is 50 mph.

Traffic Analysis

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 reasonably foreseeable developments that could substantially affect TSA intersections.

Scenario 4: Baseline Plus Project Conditions – This scenario is based on the Baseline traffic volumes plus the trips from the Proposed Project.

Scenario 5: Cumulative Conditions – This scenario includes year 2040 cumulative volumes based on planned and approved projects, the Sonoma County Traffic Model, and the Northwest Specific Plan.

Scenario 6: Cumulative Plus Project Conditions – This scenario includes year 2040 cumulative volumes based on the Sonoma County Traffic Model and the Northwest Specific Plan EIR plus the forecast trips from Proposed Project.

Traffic operations were evaluated in terms of intersection operations and trip generation. Intersection operations are evaluated in terms of "level of service" (LOS), ranging from A (best) to F (poorest). Existing traffic conditions were analyzed to provide a numeric baseline, and existing plus Proposed Project traffic conditions were analyzed using baseline data. Cumulative traffic conditions include traffic impacts due to the Proposed Project when combined with projected traffic conditions of other probable development projects in the vicinity and are discussed in **Section 4.15**.

The *Highway Capacity Manual* (HCM) methodology was used to analyze signalized and unsignalized TSA intersections. For signalized intersections, LOS values were assigned based on the average delay time in seconds that drivers experienced at a given intersection during the peak hour. Unsignalized TSA intersections were assigned LOS values based on the average vehicle delay time in seconds of turning movements yielding to opposing movements. The criterion used for each of the six LOS values are summarized in **Table 4.13-1**.

TABLE 4.13-1
LOS DEFINITIONS FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS

LOS	Signalized Delay (Seconds)	Description	Unsignalized Delay (Seconds)	Description
A	0 – 10.0	Insignificant delays	0 - 10.0	No delay for stop-controlled approaches
B	10.1 – 20.0	Minimal delays	10.1 - 15.0	Minor delays
C	20.1 – 35.0	Acceptable delays	15.1 - 25.0	Moderate delays
D	35.1 – 55.0	Tolerable delays	25.1 - 35.0	Some delays
E	55.1 – 80.0	Significant delays	35.1 - 50.0	High delays and long queues
F	> 80.0	Excessive delays	> 50.0	Extreme congestion with high delays and long queues unacceptable to most drivers
SOURCE: Table 1 and 2 of **Appendix G**				

The LOS of each TSA intersection was compared to the corresponding jurisdictional agency's criteria for acceptable operating conditions at intersections of a similar type, presented in **Table 4.13-2**.

TABLE 4.13-2
JURISDICTIONAL LOS CRITERIA

Jurisdiction	Acceptable Operating Conditions (LOS) Thresholds
Sonoma County	LOS D–Roadway intersections LOS C–Roadway segments
Rohnert Park	LOS C–Intersections and roadway segments LOS D–Intersections of Golf Course Drive/Redwood Drive and Golf Course Drive/Commerce Blvd.
Caltrans	LOS D–Signalized intersections and highways
SOURCE: **Appendix G**	

Existing Traffic Conditions

The TIS evaluated existing TSA traffic conditions to establish a baseline. TSA intersection operating conditions were evaluated using turning movement counts collected in person during weekday am and pm peak hours, and are show in **Table 4.13-3**. The overall LOS is reported in the table for signalized intersections and those that are Side Street Stop (SSS). The results of the TIS indicate that all of the existing TSA intersections currently operate at acceptable levels of service based on established significance criteria.

Existing Plus Proposed Project Traffic Conditions

The TIS evaluated TSA existing plus Proposed Project traffic conditions. TIS calculations include the analysis of potential impacts on intersection operations, as well as the analysis of trips generated from the Proposed Project. The majority of overnight patrons affiliated with a casino-hotel are predominantly casino patrons who utilize the hotel to extend their gaming stay, thus reducing vehicle trips. Since Sonoma County has no specific guidance applicable to tribal casinos, some data from San Diego County was utilized to provide guidance for the TIS analysis. The Traffic Needs Assessment of Tribal Development Projects in the San Diego Region prepared by the San Diego Association of Governments (SANDAG) (**Appendix G**) recommends a daily trip rate of three trips per occupied room for casino hotels, with 7.2% of daily traffic assumed to occur during the PM peak hour. This rate accounts for internal capture between the hotel and the casino.

TABLE 4.13-3
EXISTING INTERSECTION OPERATIONS

Intersection		Control	LOS	Delay
Weekday AM Peak Hour				
1	Wilfred Avenue/Stony Point Road	Signal	A	9.7
2	Wilfred Avenue/Langner Avenue	SSS	B	12.0
3	Wilfred Avenue/Labath Avenue/Golf Course Road	Signal	A	9.2
4	Golf Course Drive/Redwood Drive	Signal	B	16.8
5	Golf Course Drive/US 101 Southbound Ramp	Signal	B	13.7
6	Golf Course Drive/Commerce Boulevard	Signal	B	17.8
7	Commerce Boulevard/US 101 Northbound Ramp	Signal	B	10.1
8	Business Park Drive/Labath Avenue	SSS	A	9.0
9	Business Park Drive/Casino Access	Signal	B	11.2
10	Business Park Drive/Redwood Drive	Signal	A	7.0
11	Rohnert Park Expressway/Redwood Drive	Signal	B	16.5
Weekday PM Peak Hour				
1	Wilfred Avenue/Stony Point Road	Signal	B	14.1
2	Wilfred Avenue/Langner Avenue	SSS	B	13.2
3	Wilfred Avenue/Labath Avenue/Golf Course Road	Signal	B	11.8
4	Golf Course Drive/Redwood Drive	Signal	C	24.3
5	Golf Course Drive/US 101 Southbound Ramp	Signal	B	18.2
6	Golf Course Drive/Commerce Boulevard	Signal	C	28.2
7	Commerce Boulevard/US 101 Northbound Ramp	Signal	B	15.8
8	Business Park Drive/Labath Avenue	SSS	A	8.7
9	Business Park Drive/Casino Access	Signal	B	11.6
10	Business Park Drive/Redwood Drive	Signal	A	7.7
11	Rohnert Park Expressway/Redwood Drive	Signal	C	30.0
NOTE: Delay is average delay in seconds per vehicle. SOURCE: Table 3 of **Appendix G**				

Rates used in the analysis are presented in **Table 4.13-4**, which also summarizes the estimated weekday AM and PM peak hour trip generation of the Proposed Project (**Appendix G**).

TABLE 4.13-4
PROJECT TRIPS GENERATED BY THE PROPOSED PROJECT

Land Use	Size	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Proposed Casino Expansion	86~~7~~,078 sf	8,454	153	142	294	267	313	580
Proposed Hotel Expansion	221 Rooms	663	27	10	37	17	31	48
	Total Trips	**9,117**	**180**	**152**	**332**	**284**	**344**	**628**
SOURCE: Table 4 of **Appendix G**								

The approach used in the TIS 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. Additional data on casino trip generation rates was obtained from the transportation impact analysis prepared for the Tejon Casino in Kern County. The trip generation rates were based on the average of the traffic surveys conducted at three similar Indian casinos as part of the Transportation Impact Analysis of the Tejon Casino (**Appendix G**).

Table 4.13-5 identifies existing plus Proposed Project LOS operating conditions of TSA intersections for weekday peak hours. The overall LOS is reported for signalized intersections and those that are SSS. **Table 4.13-6** identifies baseline plus Proposed Project LOS operating conditions of TSA intersections for weekday peak hours. The overall LOS is reported for signalized intersections and those that are SSS.

TABLE 4.13-5
EXISTING PLUS PROPOSED PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

Intersection		Control	Existing		Existing + Proposed Project	
			LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
1	Wilfred Avenue/Stony Point Road	Signal	A	9.7	B	10.2
2	Wilfred Avenue/Langner Avenue	SSS	B	12.0	B	12.8
3	Golf Course/Wilfred Avenue/Labath Avenue	Signal	A	9.2	A	10.0
4	Golf Course Drive Redwood Drive	Signal	B	16.8	B	17.7
5	Golf Course Drive/US 101 SB Ramp	Signal	B	13.7	B	15.1
6	Golf Course Drive/Commerce Boulevard	Signal	B	17.8	B	18.7
7	Commerce Boulevard/US 101 NB Ramps	Signal	B	10.1	B	10.4
8	Business Park Drive/Labath Avenue	SSS	A	9.0	A	9.1
9	Business Park Drive/Casino Access	Signal	B	11.2	B	11.6
10	Business Park Drive/Redwood Drive	Signal	A	7.0	A	7.6
11	Redwood Drive/Rohnert Park Expressway	Signal	B	16.5	B	16.9
Weekday PM Peak Hour						
1	Wilfred Avenue/Stony Point Road	Signal	B	14.1	B	15.9
2	Wilfred Avenue/Langner Avenue	SSS	B	13.2	B	14.9
3	Wilfred Avenue/Labath Avenue	Signal	B	11.8	B	15.4
4	Golf Course Drive/Redwood Drive	Signal	C	24.3	C	27.7
5	Golf Course Drive/US 101 SB Ramp	Signal	B	18.2	C	23.8
6	Golf Course Drive/Commerce Boulevard	Signal	C	28.2	C	28.6
7	Commerce Boulevard/US 101 NB Ramp	Signal	B	15.8	B	16.5
8	Business Park Drive/Labath Avenue	SSS	A	8.7	A	9.0
9	Business Park Drive/Casino Access	Signal	B	11.6	B	12.6
10	Business Park Drive/Redwood Drive	Signal	A	7.7	A	8.9
11	Redwood Drive/Rohnert Park Expressway	Signal	C	30.0	C	31.3
SOURCE: Table 5 in **Appendix G**						

TABLE 4.13-6
BASELINE PLUS PROPOSED PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

Intersection		Control	Baseline		Baseline + Proposed Project	
			LOS	**Delay**	**LOS**	**Delay**
Weekday AM Peak Hour						
1	Wilfred Avenue/Stony Point Road	Signal	A~~B~~	9.7~~10.2~~	B	10.2~~10.9~~
2	Wilfred Avenue/Langner Avenue	SSS	B	12.0~~12.5~~	B	12.8~~13.4~~
3	Golf Course/Wilfred Avenue/Labath Avenue	Signal	A	9.2~~9.4~~	A~~B~~	10.0~~10.2~~
4	Golf Course Drive Redwood Drive	Signal	B	16.8~~17.9~~	B	17.7~~19.0~~
5	Golf Course Drive/US 101 SB Ramp	Signal	B	13.7~~15.1~~	B	15.1~~16.8~~
6	Golf Course Drive/Commerce Boulevard	Signal	B	17.8~~19.3~~	B~~C~~	18.7~~20.3~~
7	Commerce Boulevard/US 101 NB Ramps	Signal	B	10.1~~10.5~~	B	10.4~~10.8~~
8	Business Park Drive/Labath Avenue	SSS	A	9.0~~9.1~~	A	9.1~~9.2~~
9	Business Park Drive/Casino Access	Signal	B	11.2	B	11.6~~11.5~~
10	Business Park Drive/Redwood Drive	Signal	A	7.0	A	7.6~~7.7~~
11	Redwood Drive/Rohnert Park Expressway	Signal	B	16.5~~17.5~~	B	16.9~~17.9~~
Weekday PM Peak Hour						
1	Wilfred Avenue/Stony Point Road	Signal	B	14.1~~15.7~~	B	10.2~~18.1~~
2	Wilfred Avenue/Langner Avenue	SSS	B	13.2~~14.0~~	C	14.9~~15.9~~
3	Wilfred Avenue/Labath Avenue	Signal	B	11.8~~12.5~~	B	15.4~~16.5~~
4	Golf Course Drive/Redwood Drive	Signal	C	24.3~~27.1~~	C	27.7~~29.2~~
5	Golf Course Drive/US 101 SB Ramp	Signal	B~~C~~	18.2~~21.6~~	C	23.8~~30.1~~
6	Golf Course Drive/Commerce Boulevard	Signal	C	28.2~~31.9~~	C	28.6~~33.4~~
7	Commerce Boulevard/US 101 NB Ramp	Signal	B	15.8~~17.0~~	B	16.5~~17.7~~
8	Business Park Drive/Labath Avenue	SSS	A	8.7~~8.8~~	A	9.0
9	Business Park Drive/Casino Access	Signal	B	11.6~~11.7~~	B	12.6~~12.8~~
10	Business Park Drive/Redwood Drive	Signal	A	7.7~~8.0~~	A	8.9~~9.2~~
11	Redwood Drive/Rohnert Park Expressway	Signal	C	30.0~~32.3~~	C	31.3~~33.0~~
SOURCE: Table 6 in **Appendix G**						

An assessment of cumulative plus Proposed Project level of service conditions is presented in **Section 4.15.** However, cumulative assessments involving the theater are included in this section. **Table 4.13-7** identifies cumulative plus Proposed Project intersection LOS operating conditions of TSA intersections for Friday evening peak hours under worst-case scenario. The overall LOS is reported for signalized intersections and those that are SSS.

Vehicle Miles Traveled

One performance measure that can be used to quantify the transportation impacts of a project is vehicle miles traveled (VMT). Near-term plus Proposed Project VMT is shown in **Table 4.13-8**. The existing plus project VMT threshold for commercial projects in Sonoma County requires that a project's VMT be at least 15 percent below the County-wide average VMT per employee (**Appendix G**). Per the County's Travel Demand Model, the County-wide VMT average is 12.5 miles (**Appendix G**). Thus, an impact could be considered significant if a project's VMT per employee were greater than 10.7 miles.

TABLE 4.13-7
FRIDAY CUMULATIVE PLUS PROPOSED PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

Intersection		Control	Existing		Existing + Proposed Project + Theatre	
			LOS	Delay	LOS	Delay
Friday PM Peak Hour						
1	Wilfred Avenue/Stony Point Road	Signal	C~~B~~	34.2~~17.6~~	D~~C~~	50.5~~23.0~~
2	Wilfred Avenue/Langner Avenue	SSS	D~~C~~	27.2~~15.5~~	F~~C~~	57.5~~21.3~~
3	Golf Course/Wilfred Avenue/Labath Avenue	Signal	C~~B~~	23.3~~13.7~~	F~~E~~	93.9~~65.8~~
4	Golf Course Drive Redwood Drive	Signal	E~~C~~	77.3~~26.~~7	F~~D~~	122.6~~35.5~~
5	Golf Course Drive/US 101 SB Ramp	Signal	E~~C~~	63.1~~23.5~~	E	78.1~~56.2~~
6	Golf Course Drive/Commerce Boulevard	Signal	E~~C~~	77.7~~29.4~~	F~~C~~	115.3~~32.0~~
7	Commerce Boulevard/US 101 NB Ramps	Signal	D~~B~~	54.2~~16.9~~	E~~B~~	73.2~~18.9~~
8	Business Park Drive/Labath Avenue	SSS	A	8.8~~8.7~~	A	9.1~~9.0~~
9	Business Park Drive/Casino Access	Signal	B	11.9	B	14.6~~14.4~~
10	Business Park Drive/Redwood Drive	Signal	A	9.2~~7.7~~	B	12.9~~10.3~~
11	Redwood Drive/Rohnert Park Expressway	Signal	D~~C~~	42.8~~31.9~~	D~~C~~	47.3~~34.9~~

SOURCE: Table 9 in **Appendix G**
*Includes theater component under worst-case scenario

TABLE 4.13-8
NEAR-TERM PLUS PROJECT VMT RESULTS

Scenario	Project Average VMT Per Employee	VMT Impact Threshold	Impact?
2022 Plus Proposed Project	21.8 miles	10.7 miles	Yes

SOURCE: Table 10 in **Appendix G**

Alternative Transportation

Sidewalks are provided on most existing roadways in the study area with the exception of portions of Business Park Drive and Golf Course Drive/Wilfred Avenue. On the south side of Golf Course Drive there is currently a sidewalk that extends west from Redwood Drive along the frontage of the Resort to terminate at Langner Avenue. From Golf Course Drive there also is a sidewalk extending south along the west side of Labath Avenue which connects to the casino.

According to information available from the Rohnert Park General Plan, the Rohnert Park Expressway, Labath Avenue, Redwood Drive, and Business Center Drive are all identified as being planned for Class II bike routes. In addition, there are planned Class I multi modal trails in the vicinity that would connect the downtown area of the City with the area near the project site.

The Resort provides a bus service that carries patrons to and from the Bay Area, including San Francisco, Daly City, San Jose, and Milpitas. Approximately 36 buses run from the Resort to the Bay Area per day, carrying an average of 58 patrons per day each. Golden Gate Transit operates routes along US 101 that pass-through Rohnert Park and connect with cities including San Francisco, San Rafael, Petaluma, and Santa Rosa. During the weekday, routes operate in the am and pm peak travel directions and stop at the Rohnert Park inter-City transfer station.

Sonoma County Transit (SCT) provides weekday and weekend services to the Resort. Route 26 provides weekday services and routes 44, 48, and 1 provide weekend services. Public transportation in the larger area includes several intra-City routes operated by SCT which pass through a transfer station near the intersection of Commerce Drive and Rohnert Park Expressway. Buses pass through the transfer station approximately every 30 to 40 minutes on weekdays and approximately every hour on weekends. SCT also provides several inter-City routes that serve the cities of Sebastopol and Santa Rosa. Inter-City routes connect to a separate transfer station also located near the vicinity of the intra-City station. Bus frequencies are similar to the intra-City service.

The formation of the Sonoma-Marin Area Rail Transit (SMART) in 2003 provides additional transportation capacity along the US 101 corridor, with the potential to reduce congestion during peak commuting hours. SMART connects the San Francisco Bay Ferry Service to Cloverdale and has stations in the Cities of Rohnert Park and Cotati.

4.13.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by Section XVI of the Checklist (**Appendix B**) and have been used in this section to evaluate potential off-reservation environmental impacts of the Proposed Project to off-reservation transportation and traffic. Such impacts are considered significant if they would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the off-reservation circulation system, considering all modes of transportation including mass transit and non-motorized 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;
- Conflict with an applicable congestion management program, including, but not limited to, LOS 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); or
- Result in inadequate emergency access for off-reservation responders.

Potential traffic impacts associated with the Proposed Project were evaluated in the TIS (**Appendix G**). The TIS analyzed existing traffic conditions to provide a numeric baseline, and existing plus Proposed Project traffic conditions were then analyzed using this baseline data. TSA intersection operations were analyzed according to their corresponding LOS values before and after implementation of the Proposed Project. The LOS of the TSA with the trips generated by the Proposed Project were determined and then compared to the jurisdictional agencies' applicable LOS acceptability criteria (**Table 4.13-2**).

Impact 4.13-1: The Proposed Project could 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 non-motorized 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.

Off-reservation pedestrian and bicycle paths and facilities would not be altered or affected by the Proposed Project. Implementation of the Proposed Project would adhere to the RTP VMT target by providing Resort patrons with shuttle and bus transportation. The Proposed Project's current VMT per employee is 21.8 miles, which is greater than the County's threshold of 10.7 miles per employee (**Table 4.13-8)**. Mitigation Measures 4.13-1 through 4.13-3 may provide some level of impact reduction. However, the effectiveness of such measures for development projects in the area is difficult to quantify (**Appendix G**).

<u>Additionally, as construction would be phased, implementation of Mitigation Measure 4.13-4 would include updated traffic counts to confirm the analysis and mitigation herein at the time of ground-breaking of future phases, which could occur several years in the future. Development of the parking garage component would be constructed first and would not generate significant additional traffic. The hotel/casino expansion and the event center would be constructed at some point in the future. Thus, additional traffic counts to confirm intersection~~s~~ and weekend conditions would be conducted at that time.</u>

There would be a significant and unavoidable impact.

Impact 4.13-2: The Proposed Project could 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.

Construction

Approximately 30 truck trips per day are estimated throughout construction of the Proposed Project. Approximately ten loads of heavy equipment would be hauled to and from the project site each month. Weekday work is expected to begin around 7 am and end around 4 pm. Construction worker arrival peak would occur between 6:30 am and 7:30 am, and the departure peak would occur between 4 pm and 5 pm. These peak hours generally occur before the county-wide commute peak hours. BMPs in **Section 3.2.3** include the preparation of a TDM Plan, parallel to TDM requirements set forth by the SCTA. Construction can be staged so that employee parking demand is met by using on-site parking. Additionally, construction impacts would be short-term and temporary (**Appendix G**).

There would be a less-than-significant impact.

Operation

Results of the TIS indicate that existing TSA intersections currently operate at acceptable LOS based on established significance criteria and will continue to operate at acceptable LOS with implementation of the Proposed Project. Two intersections are anticipated to be affected during peak hours on Friday evenings during large theater events, with one of these intersections also affected by Friday cumulative plus Proposed Project conditions (**Table 4.13-7**). Golf Course Drive/Labath Avenue is currently at a LOS of B and could change to a LOS E with implementation of the Proposed Project during Friday night cumulative conditions. Golf Course Drive/US-101 Southbound Ramps is currently at a LOS of C and could change to a LOS E with implementation of the Proposed Project. Approximately a one-minute delay increase is anticipated at this intersection. This change in LOS would occur in the Friday peak traffic cumulative plus Proposed Project scenario as well as the cumulative special event conditions.

For special event conditions, a significant change in LOS would only occur during pre-special event traffic when ingress of traffic occurs. This is due to the lower traffic volumes that occur during the anticipated timing of post-special event egress. BMPs in **Section 3.2.3** include the implementation of a Traffic Control Plan for large theater events. **Mitigation Measures 4.13-1,**~~ and~~ **4.13-3, and 4.13-5** are recommended to reduce impacts. However, even with the recommended mitigation, delays could be considered significant and unavoidable at this intersection during the Friday cumulative plus Proposed Project scenario and special event ingress conditions.

Additionally, as construction would be phased, implementation of Mitigation Measure 4.13-4 would include updated traffic counts to confirm the analysis and mitigation herein at the time of ground-breaking of future phases, which could occur several years in the future. Development of the parking garage component would be constructed first and would not generate significant additional traffic. The hotel/casino expansion and the event center would be constructed at some point in the future. Thus, additional traffic counts to confirm intersection~~s~~ and weekend conditions would be conducted at that time.

There would be a significant and unavoidable impact.

Impact 4.13-3: The Proposed Project could substantially increase hazards to an off-reservation design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

The Proposed Project would not significantly modify the design of existing roadways and would not include operational features that would impact traffic or increase hazards. The Proposed Project would not impact off-reservation design features or incompatible uses. Furthermore, BMPs in **Section 3.2.3** include the preparation of a TDM Plan during construction, parallel to TDM requirements set forth by the SCTA.

There would be no impact.

Impact 4.13-4: The Proposed Project could result in inadequate emergency access for off-reservation responders.

The project site includes an entrance on Wilfred Avenue, the main entrance on Golf Course Drive, and two entrances on Business Park Drive. Lane widths within the project site would meet the minimum width that can accommodate an emergency vehicle, and would not be altered. In addition, BMPs in **Section 3.2.3** include the preparation of a TDM Plan, parallel to TDM requirements set forth by the SCTA to ensure traffic would not result in any significant changes to emergency vehicle response times during construction.

There would be a less-than-significant impact.

4.13.4 MITIGATION MEASURES

4.13-1 The Tribe shall amend existing agreements with the ~~County and~~ City and if necessary, the County, to address proportional impacts of the Proposed Project on the intersection at the Golf Course Drive/US-101 southbound ramps.

4.13-2 Golf Course Drive shall be modified to allow for a dual westbound left turn movement.

4.13-3 The US 101 southbound off-ramp approach shall be restriped to have a shared center left-through-right lane that would allow for a dual right turn movement onto Golf Course Drive.

4.13-4 Updated traffic counts shall be conducted at intersections and weekend conditions shall be re-assessed prior to the groundbreaking of the hotel/casino expansion and theater to confirm the findings of the TIS. If impacts are significantly greater than those specified herein, mitigation shall be adjusted accordingly. Millbrae Avenue at Stony Point Road shall also be evaluated if future traffic counts indicate that significant impacts to this intersection may occur.

4.13-5 To address potential post-event theater traffic impacts on weekends, the following measures are recommended.

1. **Wilfred Avenue at Langner Avenue**
    - Manual traffic control shall be implemented for special events.

2. **Golf Course Drive at Labath Avenue**
    - Manual traffic control for special events shall be conducted.

3. **Golf Course Drive at Redwood Drive**
    - The eastbound right-turn lane shall be restriped to create an additional shared through/right lane.
    - A westbound right-turn pocket shall be constructed along a portion of the gas station frontage.

4. **Golf Course Drive at the U.S. 101 Southbound Ramps**
    - A second southbound right turn lane shall be added.

5. **Golf Course Drive at Commerce Boulevard**
    - Signal systems on Golf Course Drive shall be monitored and adjusted.
    - Signal timing capabilities shall be upgraded to accommodate special event traffic.

6. **Commerce Boulevard at the U.S. 101 Northbound Ramps**
    - Left turn storage on the off-ramp shall be increased.

4.14 UTILITIES AND SERVICE SYSTEMS

This section addresses the off-reservation environment associated with utilities and service systems, discusses the impacts of the Proposed Project on off-reservation utilities and service systems, and presents mitigation measures, if necessary, to reduce potentially significant off-reservation environmental impacts.

4.14.1 REGULATORY SETTING

Federal, State, and local laws and regulations applicable to off-reservation utilities and service systems are discussed in **Section 4.8.1** and **4.12.1**.

4.14.2 ENVIRONMENTAL SETTING

Existing Utilities

The following is a description of the existing utilities and service systems of the project site and surrounding vicinity. Utilities discussed include water supply, wastewater, stormwater drainage, solid waste, and electricity and natural gas. Refer to **Section 4.8** and **Appendix E** for a detailed discussion on water supply and wastewater management.

Water Supply

The Resort's existing water supply system includes two water supply wells, a water treatment plant (WTP), a water storage tank, and a water distribution system. Reclaimed water piping is in place at the Resort, however it is not currently in use. These facilities are also described in **Section 4.8.2**.

Wastewater

The Resort has a municipal sewer connection pursuant to the Joint Exercise of Powers Agreement (JEPA) between the City of Rohnert Park and the Tribe (City of Rohnert Park & Federated Indians of Graton Rancheria, 2012). Wastewater facilities are described further in **Section 4.8.2.**

Stormwater Drainage

Stormwater on the project site flows in a southwesterly direction towards the Laguna de Santa Rosa. An existing stormwater collection and treatment system includes flow-through planters (water quality basins), drains, and detention basins. Drainage patterns and facilities are described in more detail in **Section 4.8.2**.

Gas and Electric

The Tribe pays Pacific Gas and Electric (PG&E) for transmission of electricity and supply of natural gas to the Resort. The Tribe also purchases electricity from Sonoma Clean Power and generates 2.4 megawatts of electricity through its own rooftop solar array. The Resort uses energy efficient appliances wherever feasible. Back-up power is provided by on-site emergency generators which are located on the west side of the Resort.

Solid Waste

The Tribe developed a Solid Waste Management Plan (SWMP) for the existing Resort in accordance with the 2013 Memorandum of Understanding between the Tribe and the City and the 2012 Intergovernmental Agreement between the Tribe and the County.

The SWMP describes measures of solid waste management, including the collection, storage, and disposal of solid waste, source reduction strategies, and recycling and composting activities. The Resort's solid waste is currently hauled off-reservation by Redwood Empire Disposal of Santa Rosa.

4.14.3 IMPACT ANALYSIS

Significance Criteria

The following criteria are established by Section XIII of the Checklist (**Appendix A**) and have therefore been used in this section to evaluate the potential off-reservation impacts of the Proposed Project on off-reservation utilities and service systems. Such an impact is considered significant if it would:

- Exceed off-reservation wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant off-reservation environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant off-reservation environmental effects; or
- Result in a determination by an off-reservation wastewater treatment provider (if applicable), which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

The analysis below relies upon ongoing well monitoring data, the water and wastewater demand of the existing resort, and information included in the Grading and Drainage Study (**Appendix D**) and the Water and Wastewater Study (**Appendix E**).

Impact 4.14-1: The Proposed Project could exceed off-reservation wastewater treatment requirements of the applicable Regional Water Quality Control Board.

As discussed in **Section 4.8**, the Proposed Project would result in an increase of approximately 124,600 gallons per day (gpd) of wastewater generated for a combined existing Resort and Proposed Project wastewater production of 257,000 gpd. Currently, the City provides wastewater collection services to the Resort for an annual fee (City of Rohnert Park & Federated Indians of Graton Rancheria, 2012). As discussed in **Section 4.8**, the JEPA currently provides wastewater treatment and disposal capacity up to ~~410~~200,000 gpd. Under the JEPA, the Tribe is allowed to discharge up to 200,000 gpd for "Phase 1" of the Resort and up to 210,000 gpd for "Phase 2" of the Resort, which the Tribe has not yet exercised. Although the time for the Tribe to exercise its option to purchase Phase 2 capacity has expired, the Tribe would amend the JEPA with the City to utilize the Phase 2 allowance to accommodate wastewater of the Proposed Project via Mitigation Measure 4.8-3.

The total wastewater flow from the existing Resort plus the Proposed Project is projected to be approximately 257,000 gpd, which is less than the capacity specified in the JEPA if the Tribe and City amend the JEPA to accommodate wastewater of the Proposed Project. The Laguna Wastewater Treatment Plant (WWTP) currently treats wastewater from the City and hence the Resort, and therefore continued use of the Laguna WWTP pursuant to the JEPA would not result in exceeding off-reservation wastewater treatment requirements of the Regional Water Quality Control Board.

As discussed in **Section 4.8**, an on-site reclaimed water production facility may be constructed at the Resort for the purpose of reducing potable water demands. Should such an on-reservation facility be constructed, wastewater would be treated to a tertiary level and would be used for landscape irrigation and other non-potable uses, such as toilet flushing.

There would be a less-than-significant-impact <u>with mitigation</u>.

Impact 4.14-2: The Proposed Project could require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant off-reservation environmental effects.

The existing on-reservation water system, including the wells and WTP have sufficient capacity to accommodate water demands of the existing Resort and Proposed Project (**Appendix E**). Water would continue to be produced on-reservation via the existing infrastructure. Therefore, construction of new water facilities that could result in off-reservation impacts would not occur. Similarly, production of wastewater would be within the limits agreed upon by the City as specified in the JEPA, <u>if the Tribe and City amend the JEPA to accommodate wastewater of the Proposed Project (Mitigation Measure 4.8-3),</u> and would not result in the need to construct new facilities or expansions of existing facilities.

Mitigation Measure 4.8-2 recommends that a reclaimed water program be implemented at the Resort. This may involve purchasing reclaimed water from the City and/or construction of an on-reservation reclaimed water production facility. If chosen, the reclaimed water system would be constructed on-reservation and would not result in off-reservation impacts.

There would be a less-than-significant-impact <u>with mitigation.</u>

Impact 4.14-3: The Proposed Project could require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant off-reservation environmental effects.

The Proposed Project would be constructed over existing paved areas, and would not generate additional stormwater runoff. The existing detention basins are appropriately sized to handle a 100-year storm event and would not be altered. Construction of the Proposed Project would result in the removal of two flow-through planters that serve as water quality basins. However, the remaining water quality basins have sufficient excess capacity to continue collection and treatment of stormwater following construction of the Proposed Project (**Appendix D**).

There would be a less-than-significant-impact.

Impact 4.14-4: The Proposed Project could result in a determination by an off-reservation wastewater treatment provider (if applicable), which serves or may serve the project that it has inadequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments.

In 2020, the Santa Rosa Regional Laguna WWTP treated approximately 15.1 million gpd (City of Santa Rosa, 2020). The Proposed Project alone would account for less than one percent of the 2020 regional wastewater flows. The existing resort plus the Proposed Project is proportional to 1.7 percent of the 2020 regional wastewater flows. As discussed in **Section 4.8**, the City currently provides wastewater collection services to the Resort (City of Rohnert Park & Federated Indians of Graton Rancheria, 2012). Wastewater produced by the Resort is collected in a sanitary sewer system and directed to a lift station. The lift station pumps the sewage off-reservation to the City's sewer system, which conveys the sewage to the Laguna WWTP, operated by the City of Santa Rosa. During preparation of the JEPA, the City determined that it had the capacity to provide wastewater conveyance of up to 410,000 gpd.

As discussed in **Section 4.8**, the Proposed Project would result in an increase of approximately 124,600 gpd of wastewater generated for a combined existing Resort and Proposed Project wastewater production of 257,000 gpd. This is well within the allowable ~~410,000 gpd~~ limit approved in the JEPA with implementation of Mitigation Measure 4.8-3

There would be a less-than-significant-impact with mitigation.

4.14.4 MITIGATION MEASURES

None.

4.15 CUMULATIVE IMPACTS

Cumulative impacts result from incremental impacts of a single development project when combined with other past, present, and probable future development projects. The purpose of cumulative analysis is to ensure that all off-reservation consequences of the Proposed Project as defined in the Compact are addressed. The following criterion is established by the Off-reservation Environmental Impact Checklist (**Appendix A**) and has been used in this section to evaluate potential off-reservation cumulative impacts of the Proposed Project. A cumulative impact would be considered significant if the Proposed Project would have impacts that are individually limited, but cumulatively considerable off-reservation.

Potential off-reservation cumulative impacts of issue areas identified as having the potential to be adversely affected by the Proposed Project are addressed below. Issue areas for which it was determined the Proposed Project will not have any potentially significant adverse off-reservation environmental impacts were eliminated from detailed discussion. These areas include: cultural resources, agricultural and forest resources, mineral resources, and recreation. Because the Proposed Project would not result in significant regional population growth or any subsequent increase in housing (**Section 4.11**), there would be no individual or cumulative impacts to schools, libraries, or parks, and these facilities are not analyzed further.

Positive cumulative impacts of the Proposed Project include the generation of additional patronage in the Sonoma County and Rohnert Park areas, which would provide an economic benefit both on and off-reservation.

4.15.1 REGULATORY SETTING

Cumulative impact analysis for the Proposed Project was based on the Sonoma County General Plan 2020 (Sonoma County, 2014), and the City of Rohnert Park General Plan (Rohnert Park, 2000). Additionally, known proposed, commenced, and completed development projects in the vicinity of the project site ~~2~~were considered. Reasonably foreseeable ~~project or~~ projects that have been approved but not yet commenced have also been considered. The environmental impacts of these projects, further described below, were utilized when determining cumulative off-reservation environmental impacts of the Proposed Project.

Sonoma County General Plan 2020

The Sonoma County 2020 General Plan is the guiding document for development in the unincorporated areas of Sonoma County, which include a portion of off-reservation properties in the vicinity of the project site. The General Plan and the General Plan Environmental Impact Report were designed to identify potential growth and planning through the year 2020. Currently, updates to the General Plan are underway but have not yet been completed. Land uses and related zoning designated by the County General Plan adjacent to the Proposed Project are largely comprised of agriculture and rural residential and do not constitute regional growth likely to cause significant impacts.

City of Rohnert Park General Plan

Updates to the City's General Plan have not yet been finalized for years following 2020. Land to the south of the reservation are designated as industrial and are already heavily developed with commercial, business, and residential uses. Land to the north and east of the reservation are designated as mixed use and Commercial-Residential. A significant portion of these areas are still used for agricultural and rural residential uses and have not been developed.

City of Rohnert NWSP and WDSP

The Northwest Specific Plan area is immediately east of the ~~Graton~~ Resort ~~and Casino~~. The Northwest Specific Plan provides development standards that regulate new development concerning height, building setbacks, parking requirements, and other development features. The Wilfred/Dowdell Village Specific Plan has a 2020 General Plan designation of Regional Commercial.

4.15.2 ENVIRONMENTAL SETTING

Table 4.15-1 identifies cumulative projects considered in the cumulative impacts analysis presented in **Section 4.15.3**. **Table 4.15-1** also provides a summary of cumulatively considerable projects and whether a project is complete, in progress, or reasonably foreseeable. These specific projects have been considered in addition to the general County and City projected and planned development discussed above as they are reasonably foreseeable or have been approved by the County or City.

TABLE 4.15-1
CUMULATIVE PROJECTS IN THE VICINITY OF THE PROJECT SITE

Project	Project Summary	Project Status
Stadium Lands Master Plan	A 33-acre planning area set aside within Rohnert Park for high density residential, commercial, and parks	Three residential projects have been approved within this development area
SOMO Village Planned Development	A 175-acre planning area set aside within Rohnert Park for residential, commercial, office, retail, and industrial use	A development plan has been approved for SOMO village
Santa Rosa residential developments	Several residential developments are proposed within infill areas of the City of Santa Rosa, including affordable housing, apartments, single family dwellings, and commercial.	The majority of projects are proposed and not yet implemented
Station Avenue	A mixture of retail, offices, public open space, and pedestrian and biking facilities near US-101 and Rohnert Park Expressway	In progress
Residences at Five Creek	135 unit apartment complex, 0.65-acre park, 132 room hotel, and 34,300 sf shopping center	Completed
Bella Creek	90 residential units in five residential buildings	Approved by the City Planning Commission
Clearwater at Sonoma Hills	90 unit assisted living and memory care facility	Completed
KG Technologies	10,000 sf building for headquarter offices and warehousing for an electronic distribution center	Completed
SOURCE: City of Rohnert Park, 2021a; City of Rohnert Park, 2021b; City of Rohnert Park, 2021c; Sonoma County, 2021		

4.15.3 IMPACT ANALYSIS

Aesthetics

As discussed in **Section 4.2**, the Proposed Project would either have have no impact or a less-than-significant impact on off-reservation aesthetic resources. BMPs in **Section 3.2.3** would reduce visual impacts of the Proposed Project. Off-reservation scenic resources would not be altered, and the character of viewsheds would not be altered as the Proposed Project would maintain the design standards of the existing Resort and would be attached to or immediately adjacent to existing structures. When considered in the context of cumulative projects in **Table 4.15-1**, the Proposed Project would not result in cumulatively considerable impacts with respect to off-reservation aesthetics.

Air Quality

As discussed in **Section 4.3**, the Proposed Project would have a less-than-significant impact on air quality. Past, present, and future development projects contribute to a region's air quality conditions on a cumulative basis; therefore, by its very nature, air pollution is largely a cumulative impact. If the individual emissions of a project contribute toward exceedance of the NAAQS, then the cumulative impact on air quality would be significant. In developing attainment designations for criteria pollutants, the USEPA considers the regions past, present, and future emission levels. The main source of CAP emissions from foreseeable development is mobile sources from automobiles, the generation of which will be reduced as fuel efficiency increases. As automobiles use less, or even run without gasoline, emissions of CAPs per mile will decrease.

Emission estimates for the Proposed Project in the cumulative year 2040 are provided in **Table 4.15-2**. Detailed calculations of mobile and stationary source emissions are included in **Appendix F**. Under future year conditions, emissions resulting from the development alternatives would be less than opening year, and would continue to be below de minimis thresholds. The development alternatives would not cumulatively adversely impact the region's air quality, and BMPs listed in **Section 3.2.3** would further reduce project-related emissions.

TABLE 4.15-2
CUMULATIVE OPERATIONAL EMISSIONS (TONS PER YEAR)

Category	Pollutants of Concern			
	ROG	NOx	PM_{10}	$PM_{2.5}$
Area	2.19	0.00	0.00	0.00
Energy	0.11	1.01	0.08	0.08
Mobile	2.52	2.79	6.43	1.74
Total	**4.82**	**3.80**	**6.51**	**1.82**
de minimis thresholds	100	100	N/A	100
Threshold Exceeded	No	No	No	No
SOURCE: **Appendix F**				

Cumulative Proposed Project emissions would be less than the de minimis thresholds. Operation of the Proposed Project in the cumulative year would not conflict with or obstruct implementation of the applicable air quality plan, violate an air quality standard, or contribute to the existing or projected air quality violation related to the emissions of ozone precursors. Operational emissions of the Proposed Project in the cumulative year 2040 would not contribute to cumulatively considerable impacts to off-reservation air quality.

Biological Resources

As discussed in **Section 4.4**, the Proposed Project would have a less-than-significant impact on off-reservation biological resources. Direct off-reservation impacts would not occur. **Mitigation Measures 4.4-1** through **4.4-2** would provide protection from indirect impacts to wetlands and special-status species. Other off-reservation development projects would implement site-specific mitigation measures in accordance with applicable regulations protecting biological resources. Therefore, the Proposed Project would not result in cumulatively considerable impacts with respect to off-reservation biological resources.

Geology and Soils

As discussed in **Section 4.5**, the Proposed Project would have a less-than-significant impact on off-reservation geology and soils. Potential off-reservation impacts would generally be limited to potential indirect impacts that could occur if impaired or high-flow runoff was allowed to exit the project site during construction. This would include adjacent waterways and the agricultural/ruderal areas immediately adjacent to the project site and would not extend into areas anticipated for future development. Operational runoff would be stored and treated on-site before being discharged to off-reservation areas. **Mitigation Measure 4.4-1** would reduce the potential for off-reservation erosion. BMPs in **Section 3.2.3** would further reduce potential impacts of the Proposed Project on off-reservation areas. Other development projects in the vicinity of the project site would be built to applicable building standards and would be subject to City or County project-level review. Additionally, the potential for the Proposed Project to contribute to cumulative impacts is limited to the construction phase and geographically limited to immediately adjacent off-reservation land. Therefore, the Proposed Project would not result in cumulatively considerable impacts with respect to off-reservation geology and soils.

Greenhouse Gases

As discussed in **Section 4.6**, the Proposed Project would have a less-than-significant impact with respect to greenhouse gas (GHG) emissions. Climate change and GHG impacts are inherently cumulative impacts. BMPs in **Section 3.2.3** would further reduce potential impacts of the Proposed Project. The Proposed Project would not result in cumulatively considerable impacts with respect to off-reservation GHG emissions.

Hazards and Hazardous Materials

As discussed in **Section 4.7**, the Proposed Project would have a less-than-significant impact with respect to hazards and hazardous materials. Potential impacts are limited to the construction phase and limited to the agricultural and ruderal lands immediately adjacent to the reservation. This is a temporary impact with a very limited geographical range. BMPs in **Section 3.2.3** would further reduce potential impacts of the Proposed Project on off-reservation areas. Additionally, the potential for the Proposed Project to increase off-reservation wildfire risk is extremely minimal as the project site is limited to paved areas and dry vegetation and significant wildfire fuel sources are not present. The Proposed Project would not result in cumulatively considerable impacts to hazards and hazardous materials.

Water Resources

As discussed in **Section 3.8**, the Proposed Project, with mitigation, would have a less-than-significant impact on off-reservation water resources. Construction of the Proposed Project would obtain coverage under and comply with a National Pollutant Discharge Elimination System (NPDES) Permit. As part of that permit, the Proposed Project would be subject to a SWPPP, which would include best management practices (BMPs) to protect water quality. BMPs in **Section 3.2.3** would further reduce potential impacts of the Proposed Project on off-reservation areas. Due to the lack of excess available yield, the Proposed Project could potentially result in cumulatively considerable off-reservation impacts with respect to water resources if other projects or additional significant agricultural pumping were to occur. The Tribe has been implementing ongoing well monitoring in accordance with the IGA of the existing Resort. Monitoring has not identified significant drawdown impacts on off-reservation wells. With implementation of **Mitigation Measures 4.8-1** and **4.8-2**, impacts to water quality and quantity would be less-than-significant. Other projects in the region would be required to implement similar mitigation to reduce potential drawdown impacts. The Proposed Project would not result in cumulatively considerable impacts to water resources.

Land Use

As discussed in **Section 4.9**, the Proposed Project would have no impact on off-reservation land use. Therefore, the Proposed Project would not result in cumulatively considerable impacts with respect to off-reservation land use.

Noise

As discussed in **Section 4.10**, the Proposed Project would have a less-than-significant impact to off-reservation sensitive receptors with respect to noise levels. The Proposed Project would not increase traffic speeds and, with mitigation, would not generate an unacceptable LOS near an area with low ambient noise levels. BMPs in **Section 3.2.3** would reduce noise levels such that applicable noise thresholds are not exceeded and ambient noise levels would not be permanently increased at off-reservation existing sensitive receptors. Therefore, the Proposed Project would not contribute to permanent cumulative noise effects.

Population and Housing

The Proposed Project does not include the construction, demolition, or displacement of housing. It is expected that the Proposed Project would largely employ permanent residents currently living within commuting distance. Additionally, there is a sufficient available housing in surrounding areas to accommodate new employees if relocation were to occur. A portion of employees may be considered low income. The Tribe has existing agreements with the City and County that address impacts to low income housing, which have been adjusted for inflation. Other similar development projects would be required to contribute similar payments. Therefore, the Proposed Project would not contribute to permanent cumulative population and housing effects.

Public Services

Existing police, fire, and emergency services were assessed and compared to the foreseeable increase in demand attributable to the Proposed Project. Although the Proposed Project would generate an increase in demand for fire protection and police services due to an increase in Resort employees and patrons, these demands would not generate a need to construct expansions of existing facilities or new facilities.

As discussed in **Section 4.12**, **Mitigation Measure 4.12-1** would be implemented to address impacts on off-reservation public services. BMPs in **Section 3.2.3** would further reduce potential impacts of the Proposed Project on off-reservation services. The Proposed Project would not result in regional population growth or a subsequent increase in housing, as discussed in **Section 4.11**. Other development projects would be required to contribute similar payments or fund public services via fees and taxes. Therefore, the Proposed Project would not result in any cumulatively considerable impact with respect to schools or other public facilities or services.

Transportation and Traffic

As discussed in **Section 4.13**, a TIS for the Proposed Project is included as **Appendix G.** The TIS was based on planning conditions assumed in the City General Plan, the County General Plan, and information provided by Caltrans and SCRTA. Identification of the off-reservation roadway intersections and segments included in the Transportation Study Area (TSA) was based on relevance and proximity to the project site.

Cumulative traffic conditions include traffic impacts due to the Proposed Project when combined with projected traffic conditions of other probable development projects in the vicinity. Cumulative (year 2040) traffic conditions were calculated without implementation of the Proposed Project to establish a baseline value. **Table 4.15-3** identifies cumulative plus Proposed Project intersection LOS operating conditions of TSA intersections for weekday peak hours. The overall LOS is reported for signalized intersections and those that are Side Street Stop (SSS).

TABLE 4.15-3
CUMULATIVE PLUS PROPOSED PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

Intersection		Control	Cumulative		Cumulative + Proposed Project	
			LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
1	Wilfred Avenue/Stony Point Road	Signal	B	12.3~~10.8~~	B	13.1~~11.5~~
2	Wilfred Avenue/Langner Avenue	SSS	B	14.0~~13.0~~	C~~B~~	15.0~~13.9~~
3	Golf Course/Wilfred Avenue/Labath Avenue	Signal	A	9.7~~9.5~~	B	10.8~~10.4~~
4	Golf Course Drive Redwood Drive	Signal	C~~B~~	21.6~~19.0~~	C	21.3~~20.2~~
5	Golf Course Drive/US 101 SB Ramp	Signal	C~~B~~	20.2~~06.5~~	C~~B~~	23.2~~18.5~~
6	Golf Course Drive/Commerce Boulevard	Signal	C	25.0~~20.6~~	B~~C~~	27.6~~21.7~~
7	Commerce Boulevard/US 101 NB Ramps	Signal	B	11.8~~10.9~~	B	12.1~~11.2~~
8	Business Park Drive/Labath Avenue	SSS	A	9.3~~9.2~~	A	9.5~~9.3~~
9	Business Park Drive/Casino Access	Signal	B	11.2~~11.1~~	B	11.6~~11.5~~
10	Business Park Drive/Redwood Drive	Signal	A	7.3~~7.1~~	A	8.0~~7.8~~
11	Redwood Drive/Rohnert Park Expressway	Signal	C~~B~~	20.7~~18.5~~	C~~B~~	21.2~~18.9~~
Weekday PM Peak Hour						
1	Wilfred Avenue/Stony Point Road	Signal	C~~B~~	26.6~~17.5~~	C	32.2~~20.7~~
2	Wilfred Avenue/Langner Avenue	SSS	C~~B~~	21.7~~14.7~~	D~~C~~	27.8~~16.9~~
3	Wilfred Avenue/Labath Avenue	Signal	B	19.1~~13.1~~	C~~B~~	30.4~~17.6~~
4	Golf Course Drive/Redwood Drive	Signal	E~~C~~	60.9~~28.3~~	E~~C~~	73.1~~31.9~~
5	Golf Course Drive/US 101 SB Ramp	Signal	D~~C~~	46.2~~25.9~~	E~~D~~	56.0~~36.5~~
6	Golf Course Drive/Commerce Boulevard	Signal	E~~D~~	25.0~~36.0~~	E~~D~~	74.0~~38.7~~
7	Commerce Boulevard/US 101 NB Ramp	Signal	D~~B~~	11.8~~18.0~~	D~~B~~	47.4~~18.8~~
8	Business Park Drive/Labath Avenue	SSS	A	8.9~~8.8~~	A	9.1~~9.1~~
9	Business Park Drive/Casino Access	Signal	B	12.0~~11.8~~	B	13.1~~12.8~~
10	Business Park Drive/Redwood Drive	Signal	A	8.1~~8.3~~	A	9.5~~9.6~~
11	Redwood Drive/Rohnert Park Expressway	Signal	D	39.4~~35.5~~	D	40.7~~37.1~~
SOURCE: Table 7 in **Appendix G**						

With implementation of the Proposed Project, TSA intersections would continue to have acceptable conditions during the weekday peak hours. Cumulative Friday night conditions including traffic generated by the theater are discussed in **Section 4.13**. As discussed in **Section 4.13**, **Mitigation Measures 4.13-1, 4.13-2,** ~~through~~ **4.13-3, and 4.13-5** are recommended to address impacts related to these conditions.

However, such mitigation cannot be guaranteed to be feasible and/or acceptable to the City/County. Therefore, impacts at two intersections (**Section 4.13**; which occur under special event ingress conditions and Friday cumulative plus Proposed Project conditions) could be considered significant and unavoidable. BMPs in **Section 3.2.3** include the preparation of a TDM Plan, parallel to TDM requirements set forth by the SCTA during construction. Other development projects in the area would also be required to implement similar mitigation, BMPs, and fair-share contributions. Therefore, with the exception of cumulative Friday conditions and special-event ingress conditions and VMT, the Proposed Project would not result in cumulatively considerable impacts with respect to off-reservation transportation and traffic.

Utilities and Service Systems

As discussed in **Section 4.14**, the Proposed Project would have a less-than-significant impact on off-reservation utilities and service systems. Pacific Gas and Electric would continue to provide electricity and natural gas for the Proposed Project. The Proposed Project's solid waste would continue to be hauled off-reservation by Redwood Empire Disposal of Santa Rosa. The Proposed Project would not significantly alter the existing stormwater runoff volumes or drainage pattern of the off-reservation area, and the existing on-reservation water facilities have sufficient capacity to accommodate water demands of the Proposed Project. Wastewater generated by the existing Resort plus the Proposed Project would be substantially less than the flow specified in the JEPA, if the Tribe and City amend the JEPA to utilizatize the Phase 2 allowance to accommodate wastewater of the Proposed Project (Mitigation Measure 4.8-3). The Proposed Project would not place a demand upon service systems such that service providers are beyond capacity.

Should construction be required to comply with **Mitigation Measure 4.8-2**, such activities would be limited to the reservation and would not result in off-reservation impacts. The Proposed Project would not result in cumulatively considerable impacts with respect to off-reservation utilities and service systems.

No Action Alternative

As an alternative to the Proposed Project, expansion of the Resort would not occur. The No Action Alternative was analyzed ~~as required by~~consistent with Section 11.8.1 of the Compact. Under the No Action Alternative, the Resort would not be modified and would continue to operate in its current form and capacity. The Proposed Project would not be developed and the project site would continue to serve as surface parking for the existing Resort. Positive cumulative impacts of the Proposed Project include the generation of additional patronage in the Sonoma County and Rohnert Park areas, thus providing an economic benefit both on and off-reservation. The No Action Alternative would not result in cumulative impacts, nor the economic benefits of the Proposed Project, and would prevent the existing Resort from properly accommodating patrons to meet current and projected demand. The objectives listed in **Section 3.1** would not be met.

SECTION 5.0

REPORT AUTHORS

ANALYTICAL ENVIRONMENTAL SERVICES
A Montrose Environmental Solutions Inc. Company
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479

Project Managers: David Zweig and Kt Alonzo

Technical Staff:
Kelli Raymond
Alexandria Fraser
Jedidiah Dowell
Ryan Munnikhuis
Bryana Clark
Sasha Korolkov
Jennifer Stucker
John Fox
Dana Hirschberg
Taylor Van Demarr

Traffic Impact Study

Abrams Associates Traffic Engineering, Inc.

Water and Wastewater Study

Brelje & Race Consulting Engineers

Grading and Drainage Study

Lochsa Engineering

SECTION 6.0

BIBLIOGRAPHY

AES, 2009. *Graton Rancheria Casino and Hotel Final Environmental Impact Statement*. February 2009.

AES, 2011. *Essential Fish Habitat Assessment,* Graton Rancheria. Prepared by Analytical Environmental Services. September 2011.

AES, 2018a. *Noise Monitoring Results*. Prepared by Analytical Environmental Services. January 2018.

AES, 2018b. Graton Rancheria Hotel Expansion Project Final Tribal Environmental Impact Report. January 2018. https://www.gratonteir.com/wp-content/uploads/2018/01/final-tribal-environmental-impact-report.pdf. Accessed October 2022.

Association of Bay Area Governments, 2021. Plan Bay Area 2050. Available online at: https://www.planbayarea.org/finalplan2050. Accessed October 2022.

Association of Bay Area Governments, 2022. Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031. Available online at: Final RHNA Methodology Report 2023-2031_update_11-22.pdf (ca.gov). Accessed February 20, 2023.

Baldwin, B.G. et al. 2012. The Jepson manual: vascular plants of California. University of California Press.

Bay Area Air Quality Management District, 2022. *Air Quality Standards and Attainment Status*. Available online at: http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status. Accessed October 6, 2022.

California Air Resources Board (CARB), 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. Available online at: https://ww2.arb.ca.gov/news/early-action-measures-reduce-greenhouse-gas-emissions. Accessed October 2022.

CARB, 2007. *Early Action Measures to Reduce Greenhouse Gas Emissions*. Available online at: https://www.arb.ca.g-ov/diesel/documents/rrpfinal.pdf. Accessed October 2022.

CARB, 2014. Overview: *Diesel Exhaust and Health*. Available online at: https://www.arb.ca.g-ov/diesel/documents/rrpfinal.pdf. Accessed October 2022.

CARB, 2017. *California's 2017 Climate Change Scoping Plan*. Available online at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf. Accessed October 2022.

California Department of Conservation, 2019. Williamson Act Program Overview. Available online at: https://www.conservation.ca.gov/dlrp/wa/Pages/wa_overview.aspx Accessed October 14 2022

California Department of Finance, 2022. *Table E-5 Population and Housing Estimates for Cities, Counties, and the State, 2020-2022*. Available online at: https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2022/. Accessed July 20, 2022. 2019 data was obtained from this same source during 2020. However, the 2019 data is no longer available online.

California Department of Conservation (DOC), 2022a. Earthquake Zones of Required Investigation. Available online at: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed September 2022.

DOC, 2022b. Fault Activity Map of California. Available online at: https://maps.conservation.ca.gov/cgs/fam/. Accessed September 2022.

Calfornia Department of Fish and Wildlife, 2022. *RareFind5, California Natural Diversity Data Base*. Available online at: https://map.dfg.ca.gov/rarefind/Login.aspx?ReturnUrl=%2-frarefind%2fview%2fRareFind.aspx Accessed September 2022.

California Department of Transportation (Caltrans), 2020. *Transportation- and Construction-Induced Vibration Guidance Manual*. June 2004. Available online at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf. Accessed October 2022.

Caltrans, 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. Available online at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf. Accessed September 2022.

Caltrans, 2021. California State Scenic Highway System Map. Available online at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e805 7116f1aacaa. Accessed December 2021.

California Economic Development Department, 2022. Employment by Industry data. Available online at: https://www.labormarketinfo.edd.ca.gov/data/employment-by-industry.html. Accessed July 20, 2022.

California Environmental Protection Agency, 2010. *Climate Action Team Report to Governor Schwarzenegger and the California Legislature*. Available online at: http://www.energy.ca.go-v/2010publications/CAT-1000-2010-005/CAT-1000-2010-005.PDF. Accessed October 20, 2022.

CGS, 2006. *Simplified Geologic Map of California*. Available online at: https://www.earthsciweek.org/sites/default/files/GMD/SimplifiedGeologicMapofCalifornia.pdf. Accessed December 2021.

California Native Plant Society, 2022. *Rare and Endangered Plant Inventory*. Available online at: http://www.rareplants.cnps.org/. Accessed September 2022.

Centers for Disease Control and Prevention, 2021. How Much Sound Can Your Ears Safely Take? And for How Long? Available online at: https://www.cdc.gov/nceh/hearing_loss/toolkit/quiz-test.html. Accessed October 2022.

City of Rohnert Park, 2000. City of Rohnert Park General Plan. Adopted July 2000. Available online at: https://cdn5-hosted.civiclive.com/UserFiles/Servers/Server_3037789/File/Planning/General%20Plan%20and%20Specific%20Plans/General%20Plan%202020/8th%20Edition%20_%20Final%20PDF.pdf . Accessed September 2022.

City of Rohnert Park, 2013. *First Amended and Restated Memorandum of Understanding by and between the City of Rohnert Park and the Federated Indians of Graton Rancheria*. Available online at: https://cdn5-hosted.civiclive.com/UserFiles/Servers/Server_3037789/File/Admin/City%20Management/Casino%20Mitigation/2013%20Amended%20and%20Restated%20MOU.pdf. Accessed October 11, 2022.

City of Rohnert Park, 2014. City of Rohnert Park Northwest Specific Plan. Available online at: https://cdn5hosted.civiclive.com/UserFiles/Servers/Server_3037789/File/Planning/General%20Plan%20and%20Specific%20Plans/Specific%20Plans/Final%20Northwest%20Specific%20Plan%20112514. Accessed October 2022.

City of Rohnert Park, 2021a. Planned Developments. Available online at: https://www.rpcity.org/city_hall/departments/development_services/a_d_u_municipal_code_amendments/general_plan___special_area_plans/planned_developments#:~:text=There%20are%20currently%20two%20housing,and%20east%20of%20Labath%20Avenue. Accessed December 2021.

City of Rohnert Park, 2021b. Station Avenue Central. Available online at: https://www.rpcity.org/city_hall/departments/development_services/station_avenue_central. Accessed December 2021.

City of Rohnert Park, 2021c. Development Activity. Available online at: https://www.rpcity.org/city_hall/departments/development_services/a_d_u_municipal_code_amendments/development_activity. Accessed December 2021.

City of Rohnert Park, 2022a. Public Safety. Available online at: https://www.rpcity.org/city_hall/departments/public_safety. Accessed June 2022.

City of Rohnert Park, 2022b. Casino Mitigation. Available online at: https://www.rpcity.org/i_want_to__/casino_mitigation#:~:text=We%20welcome%20input%20from%20the,residents%20can%20voice%20their%20concerns. Accessed October 2022.

City of Rohnert Park & Federated Indians of Graton Rancheria, 2012. *Joint Exercise of Powers Agreement by and Between City of Rohnert Park and Federated Indians of Graton Rancheria for Wastewater Services*. Accessed October 2022.

City or Santa Rosa, 2020. Santa Rosa Regional Water Reuse System Laguna Treatment Plant. Available online at: https://www.srcity.org/ArchiveCenter/ViewFile/Item/4332. Accessed October 2022.

Compact, 2012. *Tribal-State Compact between the State of California and the Federated Indians of Graton Rancheria*. Enacted March, 2012.

Federal Interagency Committee on Noise, 1992. *Federal Agency Review of Selected Airport Noise Analysis Issues*. Available online at: https://fican1.files.wordpress.com/2015/10/reports_noise_analysis.pdf. Accessed September 2022.

Federal Transit Administration, 2018. *Transit Noise and Vibration Impact Assessment*. Available online at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed September 2022.

Federal Highway Administration (FHWA), 2006. *Construction Noise Handbook*. Available online at: http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm. Accessed September 2022.

FHWA, 2021a. About America's Byways. Available online at: https://www.fhwa.dot.gov/byways/about/ Accessed December 2021.

FHWA, 2021b. America's Byways. Available online at: https://www.fhwa.dot.gov/byways/. Accessed December 2021.

Hickman et al., 1993. The Jepson Manual: Higher Plants of California.

Huffman-Broadway Group, Inc., 2006. *Biological Assessment: Proposed Gaming Facility Sonoma County, California*.

Governor's Office of Planning and Research, 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA. Available at: https://opr.ca.gov/docs/20180416-743_Technical_Advisory_4.16.18.pdf. Accessed October 18, 2022.

Intergovernmental Panel on Climate Change, 2007. *Climate Change 2007: Working Group I: The Physical Science Basis*. Combining Evidence of Anthropogenic Climate Change. Available online at: https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch9s9-7.html. Accessed November 2022.

Laguna de Santa Rosa Foundation, 2006. Restoration and Management Plan: Enhancing and Caring for the Laguna. Available online at: http://www.lagunafoundation.org/knowledgebase/?q=node/156. Accessed October 2022.

National Marine Fisheries Service, 2008. *Section 7 Biological Opinion Issued for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the USACE, the SCWA and the MCRRFC and the WCID in the Russian River Watershed*.

Natural Resources Conservation Service, 2021. Custom Soil Report for the Graton Rancheria Resort and Casino Expansion Project. Available online at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed December 2021.

Press Democrat, 2014. *A year later, Graton casino's impact limited*. Available online at: https://www.pressdemocrat.com/article/news/a-year-later-graton-casinos-impacts-limited/.

Accessed October 20, 2022.

Press Democrat, 2021. *Graton Resort & Casino in Sonoma County to boost pay for all employees*. Available online at: https://www.pressdemocrat.com/article/business/graton-resort-casino-in-sonoma-county-to-boost-pay-for-all-employees/. Accessed October 25, 2022.

Sonoma County, 2020. *Sonoma County General Plan 2020*. Available online at https://permitsonoma.org/longrangeplans/adoptedlong-rangeplans/generalplan. Accessed September 2022.

Sonoma County, 2012a. Sonoma County General Plan 2020 Noise Element. Available online at: https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/Archive/Department%20Information/Cannabis%20Program/_Documents/General-Plan-Noise-Element.pdf. Accessed October 2022.

Sonoma County, 2012b. *Intergovernmental Mitigation Agreement*. Available online at: https://cdn5-hosted.civiclive.com/UserFiles/Servers/Server_3037789/File/Admin/City%20Management/Casino%20Mitigation/Graton-Sonoma%20County%20Intergovernmental%20Agreement.pdf. Accessed October 11, 2022.

Sonoma County, 2014. General Plan – Housing Element. Available online at: https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/Archive/Department%20Information/Cannabis%20Program/_Documents/Genearl-Plan-Housing-Element.pdf. Accessed October 25, 2022.

Sonoma County, 2016a. Open Space and Resource Conservation Element, Figure OSRC-1. Available online at: https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/Archive/Department%20Information/Cannabis%20Program/_Documents/General-Plan-Map_OSRC1.pdf. Accessed October 2022.

Sonoma County, 2016b. Hazard Mitigation Plan Figure 8.11 Landslide Hazard Areas. Available online at: https://permitsonoma.org/longrangeplans/proposedlong-rangeplans/hazardmitigationupdate/maps/landslidehazardareasmap Accessed October 2022

Sonoma County, 2016c. Hazard Mitigation Plan Figure 8.1 Major Earthquake Fault Zones & Areas of Liquefaction. Available online at: https://permitsonoma.org/longrangeplans/proposedlong-rangeplans/hazardmitigationupdate/maps/earthquakefaultsmap Accessed October 2022

Sonoma County, 2018. Land Use Element Sonoma County General Plan 2020. https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/Archive/Department%20Information/Cannabis%20Program/_Documents/General-Plan-Land-Use-Element.pdf Accessed October 2022

Sonoma County, 2019a. Visual Assessment Guidelines. Available online at https://permitsonoma.org/longrangeplans/proposedlong-rangeplans/environmentalreviewguidelines/visualassessmentguidelines Accessed February 13 2023.

Sonoma County, 2019b. *First Amendment to the 2012 Graton Rancheria Intergovernmental Mitigation Agreement and Intergovernmental Agreement*. Available online at: https://sonoma-county.legistar.com/LegislationDetail.aspx?ID=4283197&GUID=1E3D5CAF-7106-4EC5-AF1B-C934749E9A74&Options=&Search=. Accessed October 11, 2022.

Sonoma County, 2021. Projects Currently Under Public Review. Available online at: https://sonomacounty.ca.gov/PRMD/Planning/Project-Review/. Accessed December 2021.

Sonoma County, 2022a. Recommended Budget Fiscal Year 2022-23, which was subsequently adopted. Available online at: https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/CAO/Documents/Public%20Reports/Budget%20Reports/0-Recommended%20Budget%20FY%202022-23%20FINAL.pdf. Accessed October 11, 2022.

Sonoma County, 2022b. Sonoma County Sheriff's Office Incident Data. Available online at: https://data.sonomacounty.ca.gov/Public-Safety/Sonoma-County-Sheriff-s-Office-Incident-Data/3rsj-iche. Accessed October 11, 2022.

Sonoma County Agricultural Preservation and Open Space District (SCAPOSD), 2021. The Vital Lands Initiative Long Range Comprehensive Plan. Available online at https://www.sonomaopenspace.org/wp-content/uploads/FINAL-VLI-FULL-REPORT-01.26.2021.pdf. Accessed October 2022.

Sonoma County Economic Development Board, 2016. *2016 Sonoma County: Local Economic Profile.* Available online at: sonomaedb.org/WorkArea/DownloadAsset.aspx?id=2147516457.

Sonoma County Fire District, 2019. Fire District Consolidations. Available online at: https://www.sonomacountyfd.org/fire-district-consolidations. Accessed October 13, 2022.

Sonoma County Fire District, 2022a. Stations. Available online at https://www.sonomacountyfd.org/stations. Accessed June 2022.

Sonoma County Fire District, 2022b. Fiscal Year 2022-2023 Preliminary Budget. Available online at: https://www.sonomacountyfd.org/files/a18d8a0fc/22-23+Preliminary+Budget.pdf. Accessed October 13, 2022.

Sonoma County Fire District, 2022c. Fiscal Year 2020 and 2021 Audited Financial Statements. Available online at: https://www.sonomacountyfd.org/financial-audits. Accessed October 25, 2022.

Sonoma County Fire District, 2022d. Fiscal Year 2021-2022 Final Budget. Available online at: https://www.sonomacountyfd.org/files/f2abbb98d/21-22+Final+Budget.pdf. Accessed October 25, 2022.

Sonoma County Fire District, 2023. 2022 Statistics. Available online at: https://www.sonomacountyfd.org/2022-stats and https://www.sonomacountygazette.com/sonoma-county-news/2022-was-a-busy-year-for-sonoma-county-fire/. Accessed February 17, 2023.

Sonoma County Office of Education (SCOE), n.d. Sonoma County School Districts. Available online at: https://www.scoe.org/files/district_map.pdf. Accessed October 2022.

Sonoma Land Trust and Laguna de Santa Rosa Foundation, 2003. *Laguna de Santa Rosa: Resource Atlas and Protection Plan*. May 2003.

Sonoma Water, 2022. About Us, Water Quality. Available online at: https://www.sonomawater.org/water-quality. Accessed October 2022.

Tribe, 2023. Email communications from Tribe, received April and May of 2023.

USGS, 2021a. Mineral Resources Data System. Available online at: https://mrdata.usgs.gov/mrds/map-commodity.html. Accessed December 2021.

USGS, 2021b. M7.2 Earthquake Scenarios - Hayward and Rodgers Creek Faults. Available online at: https://earthquake.usgs.gov/education/shakingsimulations/hayward/M7.2.php. Accessed December 2021.

USGS, 2021c. U.S. Landslide Inventory. Available online at: https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=ae120962f459434b8c904b456c82669d. Accessed December 2021.

U.S. Census Bureau, 2021a. United States Census Bureau QuickFacts. Sonoma County, Cloverdale City, Cotati City, Healdsburg City, Petaluma City. Available online at: https://www.census.gov/quickfacts/fact/table/sonomacountycalifornia,cloverdalecitycalifornia,cotaticitycalifornia,healdsburgcitycalifornia,petalumacitycalifornia/PST045221. Accessed July 20, 2022.

U.S. Census Bureau, 2021b. United States Census Bureau QuickFacts. Rohnert Park City, Santa Rosa City, Sebastopol City, Sonoma City, Windsor City, California. Available online at: https://www.census.gov/quickfacts/fact/table/rohnertparkcitycalifornia,santarosacitycalifornia,sebastopolcitycalifornia,sonomacitycalifornia,windsortowncalifornia,CA/PST045221. Accessed July 20, 2022.

U.S. Census Bureau, 2021c. United States Census Bureau QuickFacts. San Mateo County, San Francisco County. Available online at: https://www.census.gov/quickfacts/fact/table/sanfranciscocountycalifornia,sanmateocountycalifornia/PST045221. Accessed July 21, 2022.

U.S. Census Bureau, 2021d. United States Census Bureau Table DP04, 2021: ACS 5-Year Estimates Data Profiles, for Sonoma County. Available online at: https://data.census.gov/table?q=DP04:+SELECTED+HOUSING+CHARACTERISTICS&g=0400000US06_0500000US06097_310XX00US41860&tid=ACSDP5Y2021.DP04. For explanations of vacancy calculations, see a). U.S. Census Bureau Definitions and Explanations, available online at: https://www.census.gov/housing/hvs/definitions.pdf and b). U.S. Census Bureau Quarterly Residential Vacancies and Homeownership, Fourth Quarter 2022, which is available online at: https://www.census.gov/housing/hvs/files/currenthvspress.pdf. Accessed February 16, 2023.

U.S. Department of Transportation (U.S. DOT). 2015. Guidelines for the Visual Impact Assessment of Highway Projects. Available online at https://www.environment.fhwa.dot.gov/env_topics/other_topics/VIA_Guidelines_for_Highway_Projects.aspx Accessed April 3, 2023.

U.S. Environmental Protection Agency (USEPA), 2020. Sources of Greenhouse Gas Emissions. Available online at: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#:~:text=Combustion%20of%20natural%20gas%20and,and%20commercial%20sectors%20in%202020. Accessed October 2022.

USEPA, 2016. *NAAQS Table*. Available online: https://www.epa.gov/criteria-air-pollutants/naaqs-table Accessed October 19, 2022.

USEPA, 2022. Understanding Global Warming Potentials. Available online at: https://www.epa.gov/ghgemissions/understanding-global-warming-potentials#:~:text=The%20Global%20Warming%20Potential%20(GWP,carbon%20dioxide%20(CO2). Accessed October 2022.

U.S. Fish & Wildlife Service (USFWS), 2005. *Santa Rosa Plain Conservation Strategy*. Available online at: https://fws.gov/media/santa-rosa-plain-conservation-strategy. Accessed October 2022.

USFWS, 2009. *Biological Opinion on the Proposed Graton Rancheria Casino and Hotel Project, City of Rohnert Park, Sonoma County, California*. U.S. Fish and Wildlife Service (USFWS), Sacramento Fish and Wildlife Office. February 3, 2009.

USFWS, 2022. Sacramento Fish and Wildlife Office, Endangered Species Program. Available online at: http://ecos.fws.gov/ipac/. Accessed September 2022.

APPENDIX A

OFF-RESERVATION ENVIRONMENTAL IMPACT ANALYSIS CHECKLIST

Off-Reservation Environmental Impact Analysis Checklist

I. Aesthetics

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage off-reservation scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Create a new source of substantial light or glare, which would adversely affect day or nighttime views of historic buildings or views in the area?	☐	☐	☒	☐

II. Agricultural and Forest Resources

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Involve changes in the existing environment, which, due to their location or nature, could result in conversion of off-reservation farmland to non-agricultural use or conversion of off-reservation forest land to non-forest use?	☐	☐	☐	☒

III. Air Quality

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☒	☐	☐
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
d) Expose off-reservation sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people off-reservation?	☐	☐	☒	☐

IV. Biological Resources

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Have a substantial adverse impact, either directly or through habitat modifications, on any species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any off-reservation riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected offreservation wetlands as defined by Section 404 of the Clean Water Act?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

V. Cultural Resources

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Cause a substantial adverse change in the significance of an off-reservation historical or archeological resource?	☐	☐	☐	☒
b) Directly or indirectly destroy a unique off-reservation paleontological resource or site or unique off-reservation geologic feature?	☐	☐	☐	☒
c) Disturb any off-reservation human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

VI. Geology and Soils

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Expose off-reservation people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial off-reservation soil erosion or the loss of topsoil?	☐	☒	☐	☐

VII. Greenhouse Gas Emissions

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the offreservation environment?	☐	☐	☒	☐
b) Conflict with any off-reservation plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

VIII. Hazards and Hazardous Materials

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Create a significant hazard to the off-reservation public or the off-reservation environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	X	☐
b) Create a significant hazard to the off-reservation public or the off-reservation environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	X	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within onequarter mile of an existing or proposed off-reservation school?	☐	☐	X	☐
d) Expose off-reservation people or structures to a significant risk of loss, injury or death involving wildland fires.	☐	☐	X	☐

IX. Water Resources

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Violate any water quality standards or waste discharge requirements?	☐	☐	X	☐
b) Substantially deplete off-reservation groundwater supplies or interfere substantially with groundwater recharge such that there should be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	X	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation off-site?	☐	☐	X	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding off-site?	☐	☐	☐	X
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff off-reservation?	☐	☐	X	☐
f) Place within a 100-year flood hazard area structures, which would impede or redirect off-reservation flood flows?	☐	☐	☐	X

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
g) Expose off-reservation people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒

X. Land Use

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Conflict with any off-reservation land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
b) Conflict with any applicable habitat conservation plan or natural communities conservation plan covering offreservation lands?	☐	☐	☐	☒

XI. Mineral Resources

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known off-reservation mineral resource classified MRZ-2 by the State Geologist that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of an off-reservation locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

XII. Noise

Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Exposure of off-reservation persons to noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of off-reservation persons to excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
the off-reservation vicinity of the project?				
d) A substantial temporary or periodic increase in ambient noise levels in the off-reservation vicinity of the project?	☐	☐	☒	☐

XIII. Population and Housing

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Induce substantial off-reservation population growth?	☐	☐	☒	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere off-reservation?	☐	☐	☒	☐

XIV. Public Services

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered off-reservation governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the off-reservation public services:				
Fire protection?	☐	☒	☐	☐
Police protection?	☐	☒	☐	☐
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐
Other public facilities?	☐	☐	☒	☐

XV. Recreation

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a) Increase the use of existing off-reservation neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

XVI. Transportation / Traffic

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) 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?	☒	☐	☐	☐
b) 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?	☒	☐	☐	☐
c) Substantially increase hazards to an off-reservation design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access for off-reservation responders?	☐	☐	☒	☐

XVII. Utilities and Service Systems

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Exceed off-reservation wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☒	☐	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant off-reservation environmental effects?	☐	☒	☐	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant off-reservation environmental effects?	☐	☐	☒	☐
d) Result in a determination by an off-reservation wastewater treatment provider (if applicable), which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☒	☐	☐

XVIII. Cumulative Effects

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Have impacts that are individually limited, but cumulatively considerable off-reservation? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past, current, or probable future projects.	☐	☒	☐	☐

APPENDIX B

NOTICE OF PREPARATION

NOTICE OF PREPARATION

PROJECT: Graton Resort & Casino Expansion Project

SUBJECT: Notice of Preparation of a Tribal Environmental Impact Report

CONTACT: Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

DATE: April 4, 2022 **COMMENT PERIOD:** April 4, 2022 to May 4, 2022

INTRODUCTION

The Federated Indians of Graton Rancheria (Tribe) is the lead agency for the preparation of a Tribal Environmental Impact Report (TEIR) for the proposed Graton Resort & Casino Expansion Project (Proposed Project). The TEIR will examine potential off-reservation environmental effects of the Proposed Project. This Notice of Preparation (NOP) has been prepared to describe the Proposed Project and associated TEIR as well as to solicit public input regarding the scope and content of the TEIR. Comments should identify potential off-reservation environmental issues and reasonable mitigation measures to be addressed in the TEIR, and are due to the above mailing address by 5 pm May 4, 2022.

PROJECT SUMMARY AND BACKGROUND

The Graton Resort & Casino (Resort), owned by the Tribe, is operated pursuant to federal law and the Tribal-State Compact between the Tribe and the State of California (Compact). The Compact sets forth procedures for environmental review. The Tribe proposes to enhance the Resort with the construction of the Proposed Project. The Resort currently includes the existing casino and a 200-room hotel and banquet facility, which were the subject of an exhaustive Environmental Impact Statement review approved by federal agencies in 2010. The existing Resort, which opened in November 2013, includes gaming, dining, hotel, and spa facilities and associated parking. In 2016, the Tribe proposed and issued a TEIR for the addition of 200 hotel rooms and other amenities, however for various reasons that project was never constructed. The Tribe now proposes to expand the Resort with the construction of the Proposed Project, which is described below.

PROJECT LOCATION

The Resort is located immediately west of the City of Rohnert Park in Sonoma County, California, on federal trust land at 288 Golf Course Drive, Rohnert Park, California (**Figure 1**). The Resort is bounded by Wilfred Avenue to the north, Stony Point Road to the west, Rohnert Park Expressway and Business Park Drive to the south, commercial development to the east, and farmland to the west. The Proposed Project will be built on an existing Resort parking lot (**Figure 2**).

PROJECT DESCRIPTION

A site plan is shown in **Figure 3**. Components of the Proposed Project include the following.

- Casino floor expansion (approximately 144,000 square feet)
- New 5-level, 221-room hotel wing
- New 5-level parking structure
- 3,500 seat theater
- Expanded swimming pool area
- Rooftop restaurant
- Additional water tank
- Central plant addition

TEIR SCOPE

Initial analysis of potentially significant off-reservation environmental impacts was conducted using the Off-reservation Environmental Impact Analysis Checklist in Appendix B of the Compact. Issue areas where the Proposed Project will not result in potentially significant off-reservation impacts will be eliminated from detailed discussion in the TEIR. These issue areas include cultural resources, agricultural and forest resources, mineral resources, and recreation. The following off-reservation issue areas have been identified as having the potential to be impacted by the Proposed Project, and will be addressed within the TEIR:

- Aesthetics
- Air Quality
- Biological Resources
- Greenhouse Gas Emissions
- Geology and Soils
- Hazards and Hazardous Materials
- Water Resources
- Land Use
- Noise
- Population and Housing
- Public Services
- Transportation and Traffic
- Utilities and Service Systems
- Cumulative Impacts

The TEIR will assess potential impacts of the Proposed Project on the off-reservation environment and will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts. Issue areas that will and will not be addressed in the TEIR are discussed below.

Aesthetics

Aesthetic resources include scenic vistas, trees, rock outcroppings, historic buildings within a state scenic highway, and night sky conditions. The Proposed Project has the potential to result in changes to the visual character of the area. The TEIR will include a profile view of the Proposed Project, and will assess potential impacts on existing visual characteristics of the off-reservation area. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts to aesthetics.

Agricultural Resources

Agricultural resources include off-reservation areas used to produce, grow, and harvest crops and farmed products. The Proposed Project will be constructed on existing paved and disturbed areas. No off-reservation impacts to agricultural resources are anticipated. The TEIR will not discuss agricultural resources further.

Air Quality

Air quality is defined as the concentration of regulated pollutants, odor, and exposure to sensitive receptors. The Proposed Project has the potential to generate short-term emissions during the construction phase, and long-term emissions related to operation of the Proposed Project. The TEIR will assess off-reservation impacts of the Proposed Project associated with air quality, including consistency with applicable air quality standards and impacts to sensitive receptors from pollutant emissions. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts to air quality.

Biological Resources

Biological resources include sensitive habitats, wetlands and waters of the U.S., and protected plant and animal species. The Proposed Project will be constructed on an area that has been previously paved and developed, and therefore habitat quality on the project site is expected to be low. The TEIR will assess off-reservation environmental impacts of the Proposed Project. The previously issued Biological Opinion for the development of the existing Resort required exclusionary fencing to minimize potential impacts to off-reservation special-status species. This mitigation measure is anticipated to be implemented for the Proposed Project. The TEIR will identify additional mitigation measures, if necessary, to address potentially significant off-reservation impacts to biological resources.

Cultural Resources

Cultural resources include prehistoric and historic properties and items, buildings, bridges, infrastructure, paleontological resources, and resources of importance to the Tribe. The Proposed Project will be constructed on an area that has been previously disturbed by prior development, and these areas have been previously surveyed for cultural resources. Because no off-reservation areas will be disturbed by the Proposed Project, cultural resources will not be further addressed in the TEIR.

Greenhouse Gases

Greenhouse gases (GHGs) are gases that contribute to climate change. The Proposed Project may result in short-term GHG emissions associated with construction, and long-term GHGs associated with operation. The TEIR will assess off-reservation impacts of the Proposed Project associated with GHG emissions, including consistency with applicable GHG standards. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts due to GHGs.

Geology and Soils

Geology and soils include effects from earthquakes, ground shaking, seismic ground failure, landslides, or erosion as a result of the Proposed Project. The Proposed Project will be constructed on-reservation and will meet applicable earthquake safety standards. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts associated with geology and soils.

Hazards and Hazardous Materials

Hazardous materials are those that appear on a list of hazardous materials prepared by a federal, state, or local agency, or that possess characteristics defined as hazardous by such an agency. Certain hazardous materials would be used during construction and operation of the Proposed Project. The TEIR will assess off-reservation impacts associated with hazards and hazardous materials attributable to the Proposed Project. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts associated with hazards and hazardous materials.

Water Resources

Water resources include water usage, wastewater generation, water and wastewater treatment, and water quality. The Proposed Project has the potential to result in increased water use and wastewater generation. Construction of the Proposed Project may increase the potential for erosion and direct or indirect discharge of sediment and other materials into off-reservation drainages near the project site. The TEIR will assess off-reservation impacts of the Proposed Project on water resources, including; compliance with applicable plans, standards, laws, and regulations relating to water resources; off-reservation groundwater supplies and quality; alteration of off-reservation drainage patterns; and off-reservation flood hazards. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts to water resources.

Land Use

Land use is defined as the manner with which land is used and/or modified by its corresponding community. The Proposed Project would not introduce new land uses or alter existing off-reservation land use in the surrounding area. The Proposed Project would be constructed on-reservation, therefore, off-reservation land use plans, policies, habitat conservation plans, or natural community conservation plans would not apply to the Proposed Project. The TEIR will assess the Proposed Project's off-reservation impact on surrounding land uses, habitat conservation plans, and natural community preservation plans. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts to land use.

Noise

Noise is defined as unwanted sound. Construction and operation of the Proposed Project may increase off-reservation noise levels. The TEIR will assess the Proposed Project's off-reservation noise impacts. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts to noise.

Mineral Resources

Mineral resources are defined as the concentration or occurrence of natural, solid, inorganic or fossilized organic material of such grade or quality that it has reasonable prospects for economic extraction. The Proposed Project would be constructed on-reservation and would not impact off-reservation mineral resources. The TEIR will not discuss mineral resources further.

Population and Housing

Population and housing includes the potential for population growth or displacement of housing. The Proposed Project would be constructed on-Reservation and would not displace existing housing. Construction employees would reside within commuting distance of the project site.

The TEIR will assess the Proposed Project's impact on off-reservation population growth. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts associated with population and housing.

Public Services

Public services include fire protection, emergency medical services, and law enforcement. The TEIR will assess whether the Proposed Project would generate the need to construct or alter existing fire, medical, police, or other public facilities. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts to public services.

Recreation

Recreation areas include public parks and other public facilities. The Proposed Project will be built on-reservation in an area previously paved and developed. Therefore, the Proposed Project would not impact off-reservation recreation areas. The TEIR will not discuss recreation further.

Transportation and Traffic

Transportation and traffic include vehicular transportation, public transportation, and alternative modes of transportation, such as bicycles and walkways. The Proposed Project would generate additional short-term vehicular use of roads during construction. The TEIR will assess the Proposed Project's impacts on City, County, and state roads during construction and operation of the Proposed Project. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts associated with transportation and traffic.

Utilities and Service Systems

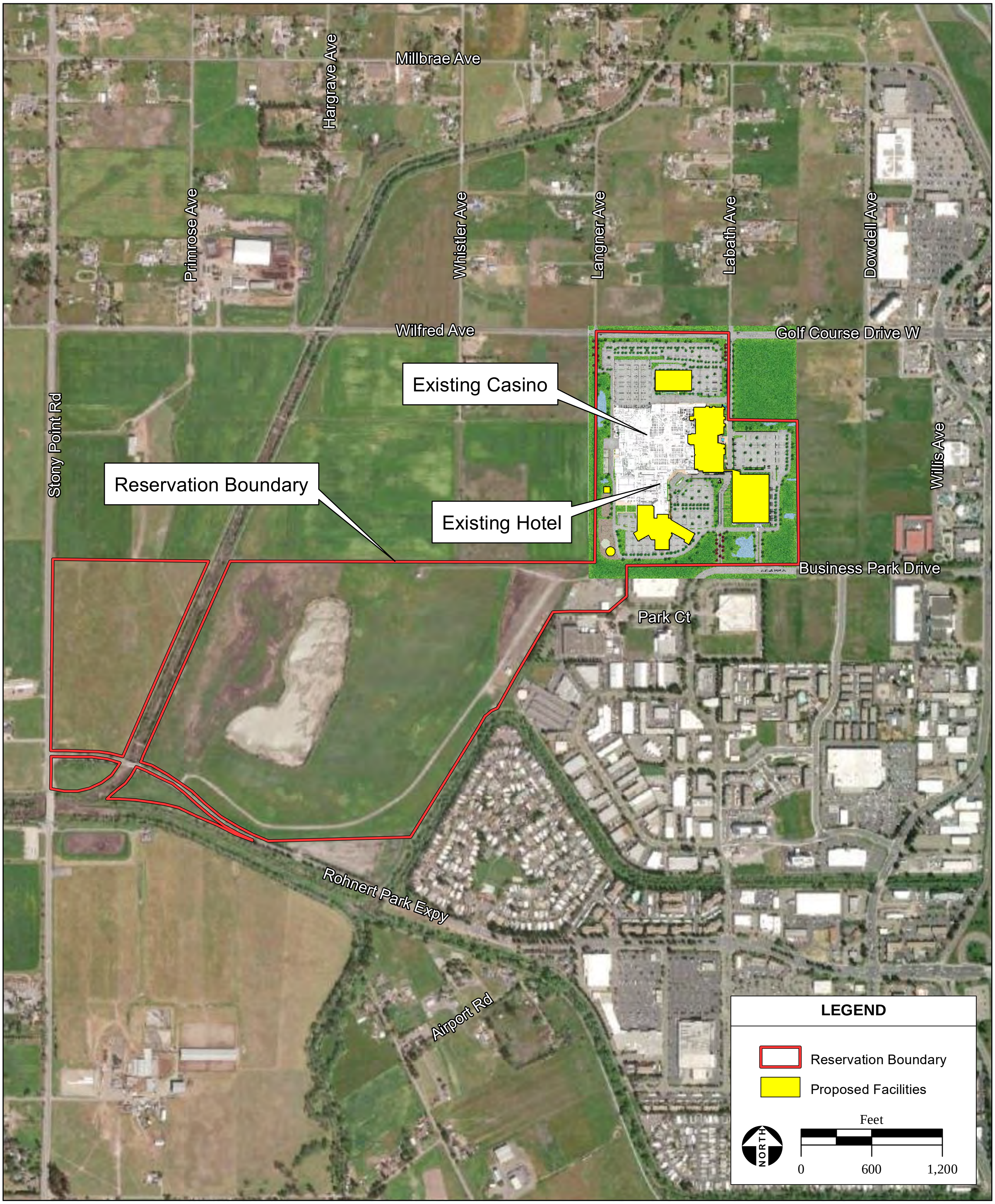
Utilities and service systems include water supply systems, wastewater, solid waste, and energy services. The existing water supply system and treatment plant on the reservation can accommodate the Proposed Project. Stormwater would be discharged into the existing drainage system. The TEIR will assess the Proposed Project's impacts on off-reservation water and wastewater treatment and drainage facilities. The TEIR will identify mitigation measures, if necessary, to address potentially significant off-reservation impacts to utilities and service systems.

Cumulative Impacts

Cumulatively considerable off-reservation environmental impacts of the Proposed Project are those that are considerable when viewed in connection with past, current, or probable future projects. The TEIR will analyze whether the Proposed Project has the potential to result in cumulatively considerable off-reservation impacts.

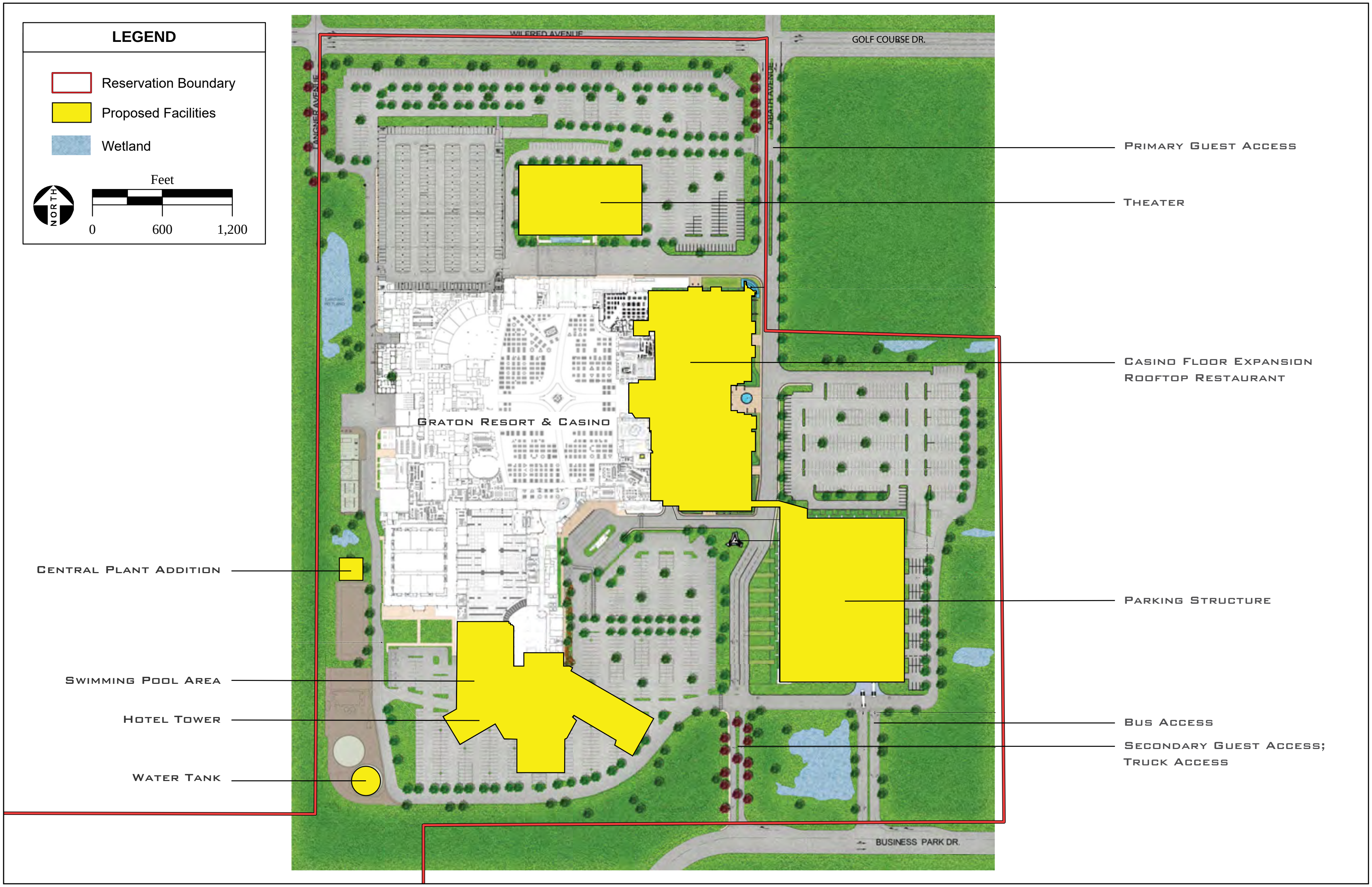
SOURCE: ESRI World Street Map, 2022; Montrose Environmental, 3/11/2022

Figure 1
Regional Location



SOURCE: Maxar aerial photograph, 4/16/2021; Montrose Environmental, 3/11/2022

Figure 2
Site and Vicinity



SOURCE: BWA, 2022; Montrose Environmental, 3/11/2022

Figure 3
Site Plan

APPENDIX C

NOTICE OF PREPARATION COMMENT LETTERS

OFFICE OF THE COUNTY ADMINISTRATOR

COUNTY OF SONOMA

575 ADMINISTRATION DRIVE – ROOM 104A
SANTA ROSA, CALIFORNIA 95403-2888
TELEPHONE (707) 565-2431
FAX (707) 565-3778

SHERYL BRATTON
COUNTY ADMINISTRATOR

CHRISTINA RIVERA
ASSISTANT COUNTY ADMINISTRATOR

PETER BRULAND
DEPUTY COUNTY ADMINISTRATOR

BARBARA LEE
DEPUTY COUNTY ADMINISTRATOR

CHRISTEL QUERIJERO
DEPUTY COUNTY ADMINISTRATOR

May 4, 2022

Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: Graton Resort & Casino Notice of Preparation of a Tribal Environmental Impact Report

Federated Indians of Graton Rancheria,
On April 6, 2022, the County of Sonoma received the Notice of Preparation dated April 4, 2022 (NOP), for the Graton Resort & Casino Expansion Project (Proposed Project). The Proposed Project is to be built on an existing resort parking lot and includes approximately 144,000 square feet expansion of the casino floor, a new 5-level, 221 room hotel wing, new 5 level parking structure, 3,500 seat theater, expanded swimming pool area, a rooftop restaurant, an additional water tank and central plant addition.

The County has review the NOP and comments on the environmental issues are presented below. Community input received by the County is also included in Attachment A, Community Input. It should be noted that the County's ability to comment meaningfully on the scope of the project is limited by the lack of a full project description. *We request that recreation be added to the issue areas listed in the NOP TIER Scope*. Overall, we support the list of issue areas listed in the NOP TIER Scope. In order to fully assess potential impacts, we look forward to the TEIR including a complete and detailed description of the project issue areas including the following components:

1. Groundwater. Detailed discussion of the potential impacts and mitigation on the Santa Rosa Plain groundwater basin including the relationship of the proposed expansion to the recently adopted Groundwater Sustainability Plan (GSP) for the basin. The GSP documents that groundwater storage is declining at a rate of 2,100 acre-feet per year and that there is potential for adverse effects to the groundwater basin. The GSP outlines a range of actions and mitigation measures to address these conditions. To be optimally informative, the TEIR should clearly explain how the proposed expansion could exacerbate these identified impacts. The TEIR should clearly explain how the project impacts can be mitigated through funding implementation actions identified in the GSP or through other mitigation measures.

2. Stormwater Management. Redevelopment for a typical, non-tribal project would have to comply with the North Coast Regional Water Board's Municipal Separate Storm Sewer (MS4) Permit that covers all of the Laguna de Santa Rosa watershed. As this is a delegated federal Clean Water Act program that the North Coast Regional Water Board administers please discuss whether the tribe is required to submit stormwater permit applications directly to US EPA or otherwise comply directly with US EPA storm water regulations. Regardless, to be optimally informative, the TEIR should

consider the benefits of a robust low impact development and best management practice program for 100% water quality treatment and 100% volume detention.

3. Traffic. An expansion of this size will have impacts on traffic and roads. To be optimally informative, the TEIR should include a full traffic study.

4. Noise. To be optimally informative, the TEIR should include noise impacts during construction and operation.

5. Air quality, VMT, GHG. To be optimally informative, the TEIR should include air quality impacts during construction and subsequent operation and VMT/GHG. Mitigation to offset the increases in GHG due to the project should include a detailed analysis by a qualified consultant and a comprehensive plan on how to address impacts through agreed upon mitigation measures.

6. Biological Resources. To be optimally informative, the TEIR should include an analysis of impacts on biological and natural resources, and include appropriate mitigation measures. The TEIR should also consider Biological Mitigation Measures from Earlier Environmental Review, as part of its present analysis. Generally, the County encourages the use of proactive measures, such as best management practices (BMPs), surveys, construction windows, low impact development (LID), plans, testing and monitoring, to avoid, minimize and mitigate potentially significant environmental effects of the project. To clarify jurisdictional information, TEIR should identify local, state, and federal agencies consulted during the preparation of the TEIR and any required permits and standards applicable to the project. To ensure the TEIR provides an accurate picture of impacts, it should also analyze cumulative impacts associated with increased development both on and off of Tribal lands for reasonably anticipated future projects.

The County appreciates the opportunity to comment on this NOP and is interested in working with the Tribe to address the concerns and impacts raised in these comments. If you have any questions regarding these comments, please contact Intergovernmental Affairs Coordinator Marissa Montenegro at Marissa.montenegro@sonoma-county.org or 707-565-3771.

Sincerely,

SHERYL BRATTON
County Administrator

Attachments:
Attachment A, Community Input

Attachment A

Community Input

Comments received in response to Sonoma County request for comments regarding proposed Graton Casino Expansion.

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

May 4, 2022

County of Sonoma

Transmitted via email to: tribalaffairs@sonoma-county.org

To Whom It May Concern:

The purpose of this letter is to communicate the impacts to the Sonoma County Fire District from the proposed expansion project at the Graton Resort and Casino.

The Sonoma County Fire District is the provider of fire and emergency medical services to the Graton Resort and Casino. Our services are provided from our Fire Station 4 located on Todd Road.

Currently, 25% of fire station 4's emergency calls for service are to the Graton Resort and Casino. The volume of our emergency responses will undoubtedly increase with your expansion project the increased occupancy and visitors. The increase in emergency responses will impact our ability, and the ability of our fire service partners, to adequately serve your facility and the surrounding communities.

The Sonoma County Fire District has a long-standing strong relationship with the Federated Indians of Graton Rancheria, and we look forward to our ongoing collaboration and partnership. I have included a copy of the letter sent to the Federated Indians of Graton Rancheria concerning this expansion project for your reference.

It is our request that the County of Sonoma and the Federated Indians of Graton Rancheria will collaborate with the Sonoma County Fire District to support us in mitigating the impacts to the fire district from the proposed expansion project.

Sincerely,

Mark Heine
Fire Chief

Cc: President Steve Klick, Sonoma County Fire District Board of Directors

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

May 4, 2022

Chairman Sarris
Federated Indians of Graton Rancheria
Attention: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

Dear Chairman Sarris,

The Sonoma County Fire District appreciates the invitation to provide comments regarding the intended expansion project. The Sonoma County Fire District, and our predecessor agency Rincon Valley Fire District, is proud to be the primary fire and emergency medical services provider to the Graton Resort and Casino.

We formed in 2019 as the result of consolidating the Rincon Valley Fire District, Bennett Valley Fire District, Mountain Volunteer Fire Company, Windsor Fire District. Since 2019, we have added the Forestville Fire District, Russian River Fire District, and the Bodega Bay Fire District to our family. We are an independent fire district governed by our own elected Board of Directors and not associated with the County of Sonoma governance. We now serve more than 250 square miles in Sonoma County including the Graton Resort and Casino.

We deeply value and appreciate our long-standing relationship and look forward to our collaboration and partnership moving forward. We support your project and look forward to the opportunity to continue to serve you.

We are concerned that the expansion project will impact our ability to continue to provide the highest quality customer service to you and the surrounding communities that we serve. These impacts will begin when construction begins, and mitigation actions must be planned and provided well ahead of time.

Our fire station that serves you is Station 4 located on Todd Road. This fire station and its services will be impacted by your expansion project. The current Intergovernmental Mitigation Agreement between the Federated Indians of Graton Rancheria and the County of Sonoma is insufficient to mitigate this impact.

Currently, 25% of fire station 4's emergency calls for service are to the Graton Resort and Casino. The volume of our emergency responses will undoubtedly increase with your expansion project the increased occupancy and visitors. The increase in emergency responses will impact our ability, and the ability of our fire service partners, to adequately serve your facility and the surrounding communities.

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

The fire district is developing plans to enhance the services that we provide by rebuilding and expanding fire station 4 to add additional firefighter and Paramedic staffing to serve you, purchase specialized equipment for high rise and high occupancy buildings, and plan for future needs. These projects are likely to cost as much as $20 million which the fire district is not capable of funding independently.

We request an opportunity to meet with your leadership to discuss the impacts of your expansion project and to identify partnership opportunities to mitigate these impacts moving forward.

Respectfully Submitted,

Mark Heine
Fire Chief

Cc: President Steve Klick, Sonoma County Fire District Board of Directors

From:	re.minder@yahoo.com
To:	TribalAffairs
Subject:	Irony in gaming
Date:	Wednesday, May 4, 2022 7:45:34 AM

EXTERNAL

I find it ironic that the Federated Indians of Graton who are announcing this huge expansion, only a short time ago expressed strong opposition to Koi Nation's attempts to launch a casino in Windsor. Rather than one tribe trying to aggressively trying to dominate the local gaming landscape, should not the tribes be supportive of each other to share the wealth and success among all the tribes of the region?

If the Graton resort can accommodate such an expansion in the area, then surely there is room for comparable gaming space at another location without opposition. It seems disingenuous to block neighboring tribes from seeking to improve themselves while cashing in at their expense.

From: Rick
To: TribalAffairs
Subject: WATER USE??
Date: Tuesday, May 3, 2022 7:52:03 AM

EXTERNAL

We in the county are facing a severe water shortage for yet another year. The casino draws tremendous amounts of precious ground water, with little or no concern as to conservation. Adding another huge addition only adds to the depletion of the aquifer. Well owners are now being faced with yet another imposed fee, to pay for "administration" costs. HOW MUCH WILL THE CASINO PAY???
Eric Hieber

Sent from my iPad

From:	Dani Sheehan-Meyer3
To:	TribalAffairs
Subject:	Support for expansion of Graton Rancheria Casino expansion
Date:	Tuesday, May 3, 2022 8:11:53 AM

EXTERNAL

To whom it may concern:
I support the expansion for several reasons:

1. The location is perfectly situated and I always wished it to have an actual theatre.
2. I do not want to see any more casinos built so expanding what exists makes sense.
3. The Graton Rancheria tribe has always supported Sonoma county environmental issues and the SMART train.

In general, the Graton Rancheria is a great business, good neighbors and job creator. I don’t think expansion changes the environmental issues negatively. It’s been in the plan all along.

DANI SHEEHAN-MEYER
Freelance Marketing Professional
7790 Welter Lane • Sebastopol, CA 95472
cell 707.486.3387 • dsheehan@sonic.net
https://www.linkedin.com/in/clichenoe/

cc: info@gratonrancheria.com

From: Elaine Reichert
To: TribalAffairs
Subject: NO expansion
Date: Tuesday, May 3, 2022 10:04:20 AM

EXTERNAL

While I respect the tribe's right to earn money, the negative impacts from expanding their already enormous hotel/casino facility boggle the mind.
Most urgent impact is on WATER! We're already in a severe drought with increasingly scarce water for existing infrastructure. Where is their huge hotel going to get its water?
Traffic is already congested in that area with climate impacts from exhaust.
Please curb this plan. Enough is enough.
Thanks,
Elaine Reichert
San Rafael

From:	lloydart@gmail.com
To:	TribalAffairs
Subject:	Graton Resort and Casino
Date:	Tuesday, May 3, 2022 8:04:01 AM

EXTERNAL

I am concerned about light pollution from expanding the Graton Resort and Casino.   Already, lights from the casino shine brighter than everything else across the valley. This is not Las Vegas. Light pollution is an environmental hazard. Stars of the night sky guide millions of birds, insects and bats on their migration routes. It is essential to design lighting to shine downward and only where needed, and to plant trees to block light from shining beyond the casino property.

I encourage the planners to design lighting that will shine downward and only where needed, and to plant trees to block light from shining beyond the casino property. Please do not contribute to light pollution.

Linda Lloyd
5019 Pressley Rd
Santa Rosa, CA 95404
lloydart@gmail.com
415-317-6896

From: Rose Cook
To: TribalAffairs
Subject: Graton Rancheria Expansion
Date: Tuesday, May 3, 2022 11:04:15 AM

EXTERNAL

How in good conscience can this even be considered? We are in a drought. The casino is already using over 82 million gallons of water per year. Their well is placed several hundred feet down ensuring they will have water while the community surrounding the casino are at risk of having their property become dry. There is no plan in place protect these properties when their wells run dry.
Once again this is about greed.
What happened to the Indegious People belief in protecting the environment? Is the earth no longer sacred to them?

Sent from my iPhone

From: pookipse
To: TribalAffairs
Subject: Graton expansion
Date: Tuesday, May 3, 2022 8:29:37 AM

EXTERNAL

The biggest concern should be about the water usage. I know they are on a well. But how many farmers and other people in the county have wells. Many of my friends have wells and they are not down 200 feet like Graton. It's a casino and hotel. Not a place trying to take care of a family or livestock.

I have nothing against gambling my whole concern is water usage.

Linda Spencer
Petaluma, CA

Sent from Mail for Windows

From: cecede7
To: TribalAffairs
Subject: Graton Casino
Date: Tuesday, May 3, 2022 8:39:16 AM

EXTERNAL

I think it's a great idea to expand the casino. Much better than building another one elsewhere.
And they are a great employer.
Cece DePaoli

Sent from Samsung Galaxy smartphone.

From: Nancy Lindell
To: TribalAffairs
Subject: Graton casino expansion
Date: Tuesday, May 3, 2022 9:55:39 AM

EXTERNAL

No! Traffic and water issues!!!!

From: m howser
To: TribalAffairs
Subject: Graton casino expansion
Date: Tuesday, May 3, 2022 10:12:28 AM

EXTERNAL

May 3, 2022

I strongly object to this expansion. I was stunned to read about this in the Press Democrat this morning. This expansion would use more water when water is getting more scarce every month.

If common sense prevailed, this expansion shouldn't even be a talking point. For some time, most of us have stopped our daily showers, have buckets under every faucet to collect water for either flushing our toilets, watering our landscaping and still watching our landscapes looking puny due to lack of irrigation. However much we try to save water, we are asked to save even more. Our ground water is disappearing at a faster rate than anticipated. There are other reasons not to expand, but this extreme drought is reason enough.

Again, I strongly object to this expansion.

M. HOWSER
PO Box 597
Cloverdale CA 95425

From: Sarah Sparks
To: TribalAffairs
Subject: Gratin expansion
Date: Tuesday, May 3, 2022 6:36:26 AM

EXTERNAL

Hello,

My name is Sarah Sparks and I live in Rohnert Park. I’m concerned about adding additional hotel space because it will consume valuable water resources during a time of persistent drought. People outside of the area are unlikely to practice the same water conservation measures as people who live here. Adding a larger swimming pool is another drain on water resources.

I haven’t seen the details of the expanded gaming floor, but i would hope a full environmental impact report will be completed and it does not negatively impact existing wildlife.

Thank you,

Sarah Sparks

Sent from my iPhone

From: stephen owens
To: TribalAffairs
Subject: Expansion
Date: Tuesday, May 3, 2022 5:17:34 AM

EXTERNAL

It is big enough. No on expansion.
Stephen Owens

From:	Dr. S Garcia
To:	TribalAffairs; hairmasters@icloud.com
Subject:	Expansion
Date:	Tuesday, May 3, 2022 11:03:31 AM

EXTERNAL

You all have done a wonderful job and made Sonoma County a better place. Just follow the path that built the first phase of your complex and environmental issues are met in our opinion. Glad to attend any meeting on your behalf. You have our vote and support. I will contact our Supervisor Hopkins today and give voice to purpose of your swift approval.

Steve and Annette Garcia Owners HairMasters
6980 McKinley Ave
Sebastopol, CA 95472
707-829-2443

Sent from Mail for Windows

CITY OF COTATI

May 3, 2022

Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

SUBJECT: City of Cotati Comments on the Notice of Preparation on the Proposed Expansion of the Graton Casino and Associated Facilities

To whom it may concern,

In response to the Notice of Preparation (NOP) for the Tribal Environmental Impact Report (TEIR), the City of Cotati (City) understands that the Federated Indians of Graton Rancheria (Tribe) intends to study the expansion of the Graton Casino and associated facilities (Casino), including a Casino floor expansion (approximately 144,000 square feet), a new 5-level, 221-room hotel wing, a new 5-level parking structure, a new 3,500 seat theater, an expanded swimming pool area, a rooftop restaurant, an additional water tank, and a central plant addition.

The City has several concerns with a further expansion of the Casino, including:

1. The potential project and cumulative impact on groundwater resources on municipal wells and on the local groundwater basin within the larger Santa Rosa Basin Groundwater Management Plan; and
2. The potential project and cumulative impact on traffic and circulation, including the impact on Highway 116; and
3. The potential project and cumulative impact on greenhouse gas emissions; and
4. The potential project and cumulative impact on public services, including the Cotati Police Department (crime) and Rancho Adobe Fire Prevention District (fire and medical calls); and
5. The potential project and cumulative impact on the availability of affordable housing, particularly in the Cotati and Rohnert Park area to staff the expanded Casino.

If you have any questions, or need further clarification on these concerns, please contact Damien O'Bid, City Manager at dobid@cotaticity.org or 707.665.3622.

Sincerely,

Mark Landman
Mayor

From: Dorothy
To: TribalAffairs
Subject: casino growth
Date: Tuesday, May 3, 2022 8:15:04 AM

EXTERNAL

Okay by me but only if they can guarantee a water source to accommodate more customers and usage.

Sent from Mail for Windows

From: Dan Schultz
To: TribalAffairs
Subject: Casino expansion
Date: Tuesday, May 3, 2022 8:42:27 PM

EXTERNAL

My name is Daniel Schultz and I am a Cotati resident. I am opposed to any expansion of the casino or other amenities on the property. It is already the largest in Northern California! I have concerns about the added environmental impact the expansion would have on water. I moved to Sonoma county because it is a rural community filled with natural beauty and farmland. The casino brings with it urban issues that our rural community is not set up to handle. Also, I am a homeowner and studies show that the value of real estate properties next to casinos drop between a 2% and 10% in the net value of the property. We don't want to lose our rural charm any more than we already have. Please leave it the size it is. Thank you for your consideration.

From: Cristhyan Alfrao
To: TribalAffairs
Subject: Resident email regarding Casino Expansion
Date: Monday, May 2, 2022 8:16:47 PM

EXTERNAL

To the leaders of Rohnert Park,

The casino is already a huge place for gamblers and it does not need to be any bigger; our city is already burdened with some of the negative aspects of the casino and expanding it will only aggravate those issues.

Please reject the Casino’s expansion proposal on behalf of the residents of Rohnert Park.

Cristhyan Alfaro.

Sent from my iPhone

From: Amy Pamatmat
To: TribalAffairs
Date: Monday, May 2, 2022 4:17:47 PM

My name is Amy Pamatmat and I am a Cotati resident. I am opposed to any expansion of the casino or other amenities on the property. It is already the largest in Northern California! I have concerns about the added environmental impact the expansion would have on water. I moved to Sonoma county because it is a rural community filled with natural beauty and farmland. The casino brings with it urban issues that our rural community is not set up to handle. Also, I am a homeowner and studies show that the value of real estate properties next to casinos drop between a 2% and 10% in the net value of the property. We don't want to lose our rural charm any more than we already have. Please leave it the size it is. Thank you for your consideration.

Amy Pamatmat
404 Wilford Ln.
Cotati, CA 94931

From:	Brad Bergum
To:	TribalAffairs
Subject:	Graton Expansion
Date:	Monday, May 2, 2022 3:46:43 PM

EXTERNAL

I'm fully in favor of their expansion. They want to build a new performing arts center and bring more lodging to Sonoma County (along with the related taxes that come with it) and they are paying for it all themselves? That sounds great to me. Thanks!

Brad Bergum
CFO/Board Member
www.visitepicenter.com
Office: 707-757-9016
Mobile: 415-948-4724

From:	walter loniak
To:	TribalAffairs
Subject:	Graton Casino Expansion
Date:	Monday, May 2, 2022 9:55:37 PM

EXTERNAL

This expansion plan is a terrible idea. The existing casino is bad enough, causing traffic concerns, crime increase,
Covid-related health concerns and environmental depredation, including severe night time light pollution. An expansion would
only increase these negative impacts on communities in Sonoma County. The casino and hotel and parking structures
are already too large and out of proportion to the local business footprint, and should not be permitted to grow larger.
The "tribe" forced the existing casino/hotel/ parking structure down the throats of the majority of Sonoma county residents,
who were opposed to the casino --- built on wetlands --- in the first place! Please do not permit a second round of this
Las Vegas $ managed $ monstrosity to be built in our community!
Thank you very much.
Walter Loniak
Sebastopol, CA

From: Kathy Korlin
To: TribalAffairs
Subject: feedback on casino expansion
Date: Monday, May 2, 2022 3:51:57 PM

EXTERNAL

To whom it may concern;

Offering my 2 cents, as a frequent visitor to Graton Casino. So frequent, in fact that I had to ban myself after digging a very deep hole in my retirement funds. After one year passed & my ban was lifted back in November, I am back to visiting at least 3 times a week, alway, always, Ieaving a loser, literally & figuratively. I wonder how many others feel terrible after leaving their 'happy' place. I have many issues but one of them is struggling with a gambling addiction. I think by expanding, you are merely feeding my addiction & others as well. I wonder how much of your massive profits you donate to fixing the problems of addiction.

Say NO to expansion. (wishful thinking).

Kathleen Korlin
player # 3040811

From: Rick
To: TribalAffairs
Subject: Casino Expansion
Date: Monday, May 2, 2022 4:01:36 PM

EXTERNAL

Where will the water come from?

Sent from my iPad

From:	Laura
To:	TribalAffairs
Subject:	Expansion
Date:	Sunday, May 1, 2022 7:13:39 PM

EXTERNAL

I oppose the expansion of the casino due to the impact of sensitive habitats. The casino is already extremely lucrative. The homeless issue near the casino needs to be dealt with before expanding multi billion dollar industries.

From: christine hoex
To: TribalAffairs
Subject: Expansion of Graton Rancheria Resort & Casino
Date: Monday, April 25, 2022 12:22:52 PM

EXTERNAL

To the Federated Indians of Graton Rancheria, and the country of Sonoma

I am not in support of an expansion of the Graton Rancheria Resort & Casino. Please consider that we are still in severe drought conditions. Expansion would have to include a bigger water budget and expansion is incongruent with water conservation efforts.

More hotel rooms, a big theatre, and parking garage all aim to expand visits and lodging to the casino. This brings with it an ongoing burden of green house gas emissions, and the construction itself brings a carbon burden.

I would not support any expansion or new development of any resort or wine event center at this time of climate emergency and water scarcity. I think the county development needs to focus on affordable housing. Housing for homeless. Fire prevention by home hardening. Energy and water efficient buildings and homes.

Christine and Tom Hoex
Santa Rosa Ca 95407

From:	James & Julie Hildbold
To:	TribalAffairs
Subject:	Input Graton Rancheria Resort and Casino
Date:	Tuesday, April 19, 2022 6:40:37 PM

EXTERNAL

Graton Rancheria Resort and Casino

Casinos have nothing to offer to family communities in the quiet neighborhoods in Rohnert Park, and now Windsor and Larkfield. Only and extreme degree of infrastructure supplied by the Casino owners and developers would make it in the least palatable.

Consider: the traffic already overwhelming, the shortage of water, and the lack of housing.
Only infrastructure support by Graton Rancheria would help:
-dig wells
- build a parkway near the casino or an area nearby to improve the movement of traffic
- build an elementary school or a tech school center
- provide funds to build a new Santa Rosa Administration Center

Without these and more – there is not incentive for our already burdened communities to speak in favor of a casino or a casino extension.

James and Julie Hildbold
308 Sejong Lane
Santa Rosa, CA

From: James & Julie Hildbold
To: TribalAffairs
Subject: Casino is not giving enough back to community
Date: Tuesday, April 19, 2022 6:47:20 PM

EXTERNAL

Graton Rancheria Resort and Casino

Casinos have nothing to offer to family communities in the quiet neighborhoods in Rohnert Park, and now Windsor and Larkfield. Only and extreme degree of infrastructure supplied by the Casino owners and developers would make it in the least palatable.

Consider: the traffic already overwhelming, the shortage of water, and the lack of housing.
Only infrastructure support by Graton Rancheria would help:
-dig wells
- build a parkway near the casino or an area nearby to improve the movement of traffic
- build an elementary school or a tech school center
- provide funds to build a new Santa Rosa Administration Center

The “$9 million a year” is not nearly enough to cope with the major costs of traffic and road building, not to mention crime mitigation associated with having a gambling club in our towns.

Without these and more – there is not incentive for our already burdened communities to speak in favor of a casino or a casino extension.

From Press Democrat:
A year after the casino opened, Rohnert Park police records showed an increase in crime in the area, including car theft, fraud, DUI, narcotics and prostitution, with the increases ranging from significant to minimal.

The tribe has an agreement to pay a total of $251 million over 20 years to Rohnert Park for public safety, education and other community services.

Separately, the tribe agreed to pay Sonoma County about *$9 million a year* for 20 years to address negative impacts of the casino.

The city is evaluating the expansion proposal, Jenkins said.

From:	Dee Jeffers-Kalder
To:	TribalAffairs
Subject:	Casino
Date:	Sunday, April 17, 2022 6:26:13 PM

PLEASE, NO MORE CASINOS IN SONOMA COUNTY!!

From: Robert B Souza
To: TribalAffairs
Subject: Grayton casino expansion
Date: Saturday, April 16, 2022 9:14:58 AM

EXTERNAL

While this expansion will increase employment opportunites and temporary construction jobs for the area. This expansion will increase traffic, and infrastructure issues for everything south. The impact to Cotati, and Rohnert Park will bear the most of the increase volume.The addition of the 3500 seat theatre will impact the evening traffic for the obvious special events. 3500 seats represents 1700 vehicles arriving for a specific event, these all impact on local public safety. Has the county looked at a public records act request for CHP, Rohnert Park, Santa Rosa, Cotati, and Sonoma Sheriff as the number of DUI's, auto thefts, accidents, domestic violence, and thefts related to the current property. With increase volume brings increase crime.

This expansion plan will in essence double the size of the current property and thus double the impact of public safety, and its related costs. The roads and infrastructure are all single lanes each way to access the casino (Stony Point & Wilfred).

The Grayton Ranchera has contributed a lot to Sonoma County and I wish the tribe well. But how much is enough, and how will its decision impact on our area.

Robert Souza

From:	Carl Wahl
To:	TribalAffairs; Lynda Hopkins
Subject:	Graton Resort & Casino expansion
Date:	Friday, April 15, 2022 7:26:44 PM

To Whom It May Concern & Supervisor Hopkins,

My wife and I are opposed to the proposed expansion of the Graton Resort & Casino.

The three main things Sonoma County is becoming known for are wine, cannabis, and gambling. This is not something to be proud of.

Cannabis and gambling, attract a higher crime element than that found in the general population. This in turn strains the ability of law enforcement to counteract the increased crime. We feel that mitigating the crime that would result from the proposed expansion, as well as this project's associated water, waste, air pollution, and traffic issues, will take more resources than can be bought with the increased tax revenue.

Sonoma County doesn't need an additional 144,000 sq. ft. gambling area, nor does it need more hotel rooms placing additional strains on our dwindling water supply.

We therefore respectfully request that Sonoma County take the morally and environmentally correct action and oppose this unneeded expansion.

Sincerely yours,
Carl & Margaret Wahl
3585 Joy Road
Occidental

May 2, 2022

AES-Montrose
1801 7th Street Suite 100
Sacramento, CA 95811
Attn: Kt Alonzo, Senior Project Manager

Transmitted via electronic and overnight mail

RE: Graton Resort & Casino Expansion – Notice of Preparation of Tribal Environmental Impact Report

To whom it may concern,

The City of Rohnert Park (City) has received the *Graton Resort & Casino Expansion – Notice of Preparation of Tribal Environmental Impact Report (NOP)* dated April 4, 2022. The City borders the Federated Indians of Graton Rancheria's (Tribe's) Reservation, which includes the current resort and casino. The City and the Tribe are parties to a number of agreements that support the operation of the resort and casino with the goal of mitigating the impacts of the Tribe's operations on the City.

The City has reviewed the NOP and provides the following comments.

Scope of the Project

1. In order to be able to accurately evaluate the potentially significant off-reservation impacts of the proposed Project, please provide a more accurate and thorough description of the development that is intended. The description in the NOP regarding the scope of the project is insufficient to enable Interested Persons to provide a meaningful response or comment. Therefore, greater specificity regarding the proposed project is needed. By way of example, the please provide the following information as part of the project description:

- The casino floor expansion of 144,000 square feet: is the expansion single level or multiple levels; how many slot machines are intended to be added; how many card tables; if gaming other than slots or card tables is contemplated, provide a description of those stations; how much parking is being allocated for this expanded use?
- The new 5-level, 221 room hotel: what is the square footage of floor area per floor; how many rooms per floor; what is the square footage of floor area per room; what is the intended height of the hotel; how many elevators are being provided; how much parking is being allocated for this use?
- The new 5 level parking structure: how many parking spaces will be provided; what is the square footage of floor area pre floor; how many electric charging stations are being provided; is the parking free, and if not, what is the intended pricing; what is the intended height?
- The new 3,500 seat theatre: what is the square footage of floor area; what is the intended height; what is the planned frequency of events to be held and hours of operation; how much parking is being allocated for this use?

- The expanded swimming pool area: what is the size in square feet of the new pool; what is the capacity (gallons of water) of the pool; what is the annual consumption of water to be used by the pool; what is the required energy to heat the pool?
- Rooftop restaurant: what is the size in square feet of the new restaurant; how many tables/seats will be provided; what are the hours of operation; how much parking is being allocated for this use?
- Additional water tank: what is the capacity of this tank; what are the dimensions of the tank (height and circumference); is this tank for holding potable or non-potable water?
- Central plant addition: what is the purpose of this plant addition; what are the dimensions of the plant addition?
- How many total additional workers will be employed as a result of the proposed project; how many shifts and how many workers per shift; how much parking is being allocated for employee parking?
- What is the length of the construction period for the proposed project; will construction of the project be phased or constructed all at once; how many construction workers will be required for each phase of construction; how much parking is being allocated for construction workers and where on the project site will they park?
- How many construction related truck and vehicle trips will be coming to and leaving the site during the entire construction period for the proposed project and for each phase of construction?
- How much soil will be excavated from the project site and where will it be disposed of?

Scope of the TEIR

2. Please note that mitigation measures to address potentially significant off-reservation impacts, such as potential road widening and expansion of water, wastewater, and storm water facilities could result in additional potentially significant impacts associated with the implementation of these mitigation measures, and thus these secondary impacts must be analyzed and feasible mitigation identified.

3. The City strongly encourages the inclusion of an analysis of the potential energy impacts of the proposed project in accordance with Appendix F of the California Environmental Quality Act (CEQA) Guidelines. The issues surrounding energy have a strong interrelationship with greenhouse gas emissions, which topic area is in the Checklist and the NOP indicates will be analyzed, and related issues of climate change. Accordingly, these issues should be considered as part of a holistic strategy to minimize wasteful, inefficient, or unnecessary consumption of energy resources during project construction and operation and associated greenhouse gas emissions and to mitigate their impacts on climate change. In particular, the City encourages the elimination of the use of natural gas in its proposed new buildings, as well as the transition of its existing facilities on the Reservation, and to consider the introduction of solar panel collection systems on rooftops and parking areas and parking structures to serve the energy needs of the Reservation.

Hazards and Hazardous Materials

4. Sonoma County has experienced three significant wildfire events in the past five years. With the ongoing drought in the State of California, the likelihood for additional wildfire events in the foreseeable future is extremely high. Indeed, wildfires have always been a part of the California landscape, only their intensity and frequency have increased. The TEIR should clearly discuss the plans for managing increased guests at the expanded facilities, including plans for evacuation routes, in order to ensure the proposed project and the expected increase in the number of patrons and vehicles does not impact evacuation routes and expose off-reservation people to a significant risk of loss, injury or death from wildfires. The TEIR should clearly describe and evaluate opportunities for coordinating with neighboring emergency management agencies including CalFire, the cities of Rohnert Park and Santa Rosa and the Rincon Valley, Rancho Adobe, Goldridge Fire, and Sonoma County Fire Districts, and identify measures the Tribe can undertake in partnership with these agencies to mitigate potentially significant impacts.

Water Resources

5. Please discuss in detail the potential impacts and mitigation on the Santa Rosa Plain groundwater basin (Basin) including the relationship of the proposed expansion to the recently adopted Groundwater Sustainability Plan (GSP) for the Basin. The GSP documents that groundwater storage is declining at a rate of 2,100 acre-feet per year and that there is potential for adverse effects to the Basin. The GSP outlines a range of actions and mitigation measures to address these conditions. The TEIR should clearly explain how the proposed expansion could exacerbate these identified impacts. The TEIR should clearly explain how the project impacts can be mitigated through funding implementation actions identified in the GSP or through other mitigation measures. If applicable, mitigation measures should include detailed descriptions of necessary modifications to existing water resource systems and potentially significant impacts associated with implementation of modifications to existing water resource systems must be analyzed and feasible mitigation identified. Further, please evaluate the feasibility of dual plumbing the proposed new facilities for use of recycled water in the event such a resource becomes available for use, such as in restrooms.

6. The TEIR should clearly describe the plan for wastewater treatment and disposal. Treatment and disposal of wastewater is currently the subject of a Joint Exercise of Powers Agreement by and between the City of Rohnert Park and the Federated Indians of the Graton Rancheria (Wastewater JEPA). The Wastewater JEPA only covers the Project as defined in the agreement, which is fully constructed. This new proposed project is a third expansion of the Resort and Casino and is not included in the Wastewater JEPA. The project is currently utilizing much of its available wastewater treatment and disposal capacity under the Wastewater JEPA. While the Wastewater JEPA included an option for the purchase of addition capacity, this option was not exercised and has since expired.

   As outlined in the Wastewater JEPA, the Reservation currently utilizes capacity in the City's main sewer outfall and a portion of the City's capacity rights in the Santa Rosa Subregional System's (Santa Rosa) treatment and disposal system. The City believes that these systems may have capacity to support the proposed expansion but utilizing that capacity will require amendments to existing agreements.

   The Wastewater JEPA also discusses the potential for recycled water to be provided to the Resort and Casino site. Since the execution of the Wastewater JEPA, the City has entered into a Recycled Water Producer-Distributor Agreement with Santa Rosa that describes the terms under the City took ownership of the recycled water system that serves users in the City and under which Santa Rosa (Producer) will provide recycled water to the City (Distributor). For a variety of reasons, Santa Rosa's recycled water system has capacity constraints and Santa Rosa imposed a limit on the amount of recycled water it will provide to the City through the Producer-Distributor Agreement. Under certain hydrologic conditions, the City currently utilizes all the recycled water allocated through the Producer- Distributor Agreement. However, increased flows from the proposed expansion of the Resort and Casino would directly result in an increased recycled water supply. The City supports the use of recycled water at the Graton Resort and Casino and believes that the recycled water generated by increased flows from the Graton Resort and Casino should be used to help offset the water demands of the Resort and Casino.

The TEIR should include a detailed discussion of the existing wastewater treatment and water recycling systems and agreements, including capacity allocations, and the new capacity requirements. Mitigation Measures should include detailed descriptions of the modifications to existing systems and agreements that would allow increased wastewater flows from the proposed Resort and Casino expansion to be treated and returned for beneficial reuse. Further, as alluded to at the outset, potentially significant impacts associated with implementation of modifications to existing sewer system facilities must be analyzed and feasible mitigation identified if necessary.

Land Use

7. The TEIR should clearly discuss the relationship between the proposed expansion and the City's adopted Wilfred-Dowdell and Northwest Specific Plans.

Noise

8. The TEIR should clearly include residential development and hotels within the City as sensitive receptors with respect to noise impacts from project construction and operation of the proposed project and should include mitigation for potential noise impacts. Among other matters, the analysis should evaluate the impact of noise generating mechanical equipment (e.g. air conditioners, fans, blowers, generators) and mitigate the noise impacts through design and installation of acoustical shields, covers and enclosures, as well as impose limitations on the day of the week and time of day during which construction activities can be undertaken as a means to mitigate impacts of construction noise on off-reservation persons and businesses.

9. The TEIR should provide full information on hours of operation, and examine noise impacts from its operation during sensitive hours, particularly nighttime.

Population and Housing

10. The TEIR should clearly describe the increased workforce necessary to support the expansion and should analyze the demand that this increased workforce will place on the regional housing stock, especially the region's affordable housing stock. TEIR mitigation measures should include reasonable provisions for increasing workforce housing in the region, payment of the affordable housing linkage fee in accordance with Chapter 3.36 of the City of Rohnert Park Municipal Code, or a combination thereof. Further, the City strongly encourages evaluation of a project alternative that includes the construction of work force housing to house some of its employees on the project site. See comment 22 under Alternatives.

11. Numerous studies have shown a causal link between problem gambling and homelessness, and the project proposes to add significant additional gaming area. Increased incidence of homelessness causes impacts on the environment in terms of unpermitted camping in public places and resultant public

health and safety impacts from unsanitary living conditions. Accordingly, the TEIR should analyze the impact of increased gaming on homelessness and identify measures to mitigate and address homelessness and its resulting impacts on the environment.

12. The TEIR should thoroughly analyze the likely need for construction workers to commute excessively long distances to the project site. The City's experience on large construction projects is that workers often travel from Solano County, the Central Valley, and beyond, distances that are not ordinary commuting distances. Mitigation measures should include consideration of housing workers locally during project construction, as well as the availability of such accommodations, as a means to mitigate the impact of the additional Vehicle Miles Traveled (VMT) and greenhouse gas emissions associated with these long commutes. Indeed, the analysis should evaluate the feasibility of using a portion of the existing project hotel facilities to temporarily house construction workers during the workweek.

Public Services

13. While the City is not the primary provider, the City currently provides public safety services via automatic aid and mutual aid agreements to the site of the proposed project in the form of fire protection, emergency medical service, and law enforcement and the proposed project will result in a proportional increase in the demand for services from these public safety service providers. The TEIR should describe the impacts on these local public service providers (i.e. fire protection, emergency medical service and law enforcement) that will result from the construction and operation of the proposed project and identify proposed measures for mitigating these impacts, including fiscal mitigation. In addition, the TEIR needs to evaluate the need for new or altered public safety facilities as a result of the increased demand on public safety services and fiscal mitigation to fund needed facility expansion and modification.

14. Please see comment 4 under Hazards and Hazardous Materials for the City's comment on analysis of wildfire issues.

Transportation and Traffic

15. The TEIR should clearly identify the existing performance of the regional transportation system in the vicinity of the project area, including the Level of Service experienced on Golf Course Drive, Commerce Boulevard and the Highway 101 interchange at Golf Course Drive, and the performance of these transportation systems based on build out of the proposed project.

16. The TEIR should analyze **both** the short-term construction impacts and long term operational impacts to traffic and the transportation system. Reasonable mitigation measures should include widening Golf Course Drive, extending Dowdell Avenue between Golf Course Drive and Business Park Drive (to complete an alternate route to Redwood Drive), improving the Highway 101 interchange and improving the signal control system and their efficacy should be fully analyzed.

17. An analysis of local transportation system both pre-and post-event for the 3,500 seat theater should be done including queuing analysis, delays, and Level of Service to inform mitigation measures to ensure the continued operation of local transportation systems for off-reservation persons and the safety of patrons and other motorists.

18. The proposed expansion project will be a regional draw and the TEIR should thoroughly analyze the increase in Vehicle Miles Traveled (VMT) that will result from the project. Reasonable mitigation measures including policy and fiscal support for regional transit systems (including SMART), last-mile solutions (including shuttle service to the Casino), support of Sonoma County Transit Authority's Regional VMT bank and financial support of transportation demand management programs that reduce VMT in the region should be proposed and their efficacy should be fully analyzed.

19. The traffic analysis should evaluate current conditions plus buildout of the surrounding areas with the addition of the proposed project, and necessary mitigation.

Utilities and Service Systems

20. Please see comments 5 and 6 under Water Resources.

Cumulative Impacts

21. The TEIR should analyze the impact of the proposed project in all issue areas including buildout of the City's proposed General Plan 2040 and Housing Element.

Alternatives

22. The TEIR should describe and evaluate a range of reasonable alternatives to the proposed project. While the City acknowledges that Section 11.8.1 (b) of the Compact provides that the analysis need not address alternatives that would cause the Tribe to forgo its right to engage in the gaming activities authorized by the Compact, it is worth noting that the Tribe is already engaging in such gaming activities and the proposed project seeks to expand those gaming activities. Accordingly, the TEIR should include a range of reasonable alternatives, including one that includes the construction of workforce housing on the project site to house some of the Tribe's employees on the project site as a means to mitigate impacts on housing, transportation and traffic, air quality and greenhouse gas emissions.

The City looks forward to reviewing the Draft TEIR. Please include the City in your list of interested parties to receive the Notice of Availability when the TEIR is available to review.

Sincerely,

Mary Grace Pawson, Development Services Director

C: Darrin Jenkins, City Manager
Michelle Marchetta Kenyon, City Attorney
Michael Biddle, City Attorney's Office
Jeff Beiswenger, Planning Manager

City Council

Jackie Elward
Mayor

Willy Linares
Vice Mayor

Gerard Giudice
Susan Hollingsworth-Adams
Pam Stafford
Councilmembers

Darrin Jenkins
City Manager

Don Schwartz
Assistant City Manager

Michelle Marchetta Kenyon
City Attorney

Sergio Rudin
Assistant City Attorney

Cindy Bagley
Director of Community Services

Nishil Bali
Finance Director

Vanessa Garrett
Director of Public Works

Sylvia Lopez Cuevas
City Clerk

Tim Mattos
Public Safety Director

Mary Grace Pawson
Director of Development Services

Victoria Perrault
Human Resources Director

May 2, 2022

AES-Montrose
1801 7th Street Suite 100
Sacramento, CA 95811
Attn: Kt Alonzo, Senior Project Manager

Transmitted via electronic and overnight mail

RE: Graton Resort & Casino Expansion – Notice of Preparation of Tribal Environmental Impact Report

To whom it may concern,

The City of Rohnert Park (City) has received the *Graton Resort & Casino Expansion – Notice of Preparation of Tribal Environmental Impact Report (NOP)* dated April 4, 2022. The City borders the Federated Indians of Graton Rancheria's (Tribe's) Reservation, which includes the current resort and casino. The City and the Tribe are parties to a number of agreements that support the operation of the resort and casino with the goal of mitigating the impacts of the Tribe's operations on the City.

The City has reviewed the NOP and provides the following comments.

Scope of the Project

1. In order to be able to accurately evaluate the potentially significant off-reservation impacts of the proposed Project, please provide a more accurate and thorough description of the development that is intended. The description in the NOP regarding the scope of the project is insufficient to enable Interested Persons to provide a meaningful response or comment. Therefore, greater specificity regarding the proposed project is needed. By way of example, the please provide the following information as part of the project description:

- The casino floor expansion of 144,000 square feet: is the expansion single level or multiple levels; how many slot machines are intended to be added; how many card tables; if gaming other than slots or card tables is contemplated, provide a description of those stations; how much parking is being allocated for this expanded use?
- The new 5-level, 221 room hotel: what is the square footage of floor area per floor; how many rooms per floor; what is the square footage of floor area per room; what is the intended height of the hotel; how many elevators are being provided; how much parking is being allocated for this use?
- The new 5 level parking structure: how many parking spaces will be provided; what is the square footage of floor area pre floor; how many electric charging stations are being provided; is the parking free, and if not, what is the intended pricing; what is the intended height?
- The new 3,500 seat theatre: what is the square footage of floor area; what is the intended height; what is the planned frequency of events to be held and hours of operation; how much parking is being allocated for this use?

- The expanded swimming pool area: what is the size in square feet of the new pool; what is the capacity (gallons of water) of the pool; what is the annual consumption of water to be used by the pool; what is the required energy to heat the pool?
- Rooftop restaurant: what is the size in square feet of the new restaurant; how many tables/seats will be provided; what are the hours of operation; how much parking is being allocated for this use?
- Additional water tank: what is the capacity of this tank; what are the dimensions of the tank (height and circumference); is this tank for holding potable or non-potable water?
- Central plant addition: what is the purpose of this plant addition; what are the dimensions of the plant addition?
- How many total additional workers will be employed as a result of the proposed project; how many shifts and how many workers per shift; how much parking is being allocated for employee parking?
- What is the length of the construction period for the proposed project; will construction of the project be phased or constructed all at once; how many construction workers will be required for each phase of construction; how much parking is being allocated for construction workers and where on the project site will they park?
- How many construction related truck and vehicle trips will be coming to and leaving the site during the entire construction period for the proposed project and for each phase of construction?
- How much soil will be excavated from the project site and where will it be disposed of?

Scope of the TEIR

2. Please note that mitigation measures to address potentially significant off-reservation impacts, such as potential road widening and expansion of water, wastewater, and storm water facilities could result in additional potentially significant impacts associated with the implementation of these mitigation measures, and thus these secondary impacts must be analyzed and feasible mitigation identified.

3. The City strongly encourages the inclusion of an analysis of the potential energy impacts of the proposed project in accordance with Appendix F of the California Environmental Quality Act (CEQA) Guidelines. The issues surrounding energy have a strong interrelationship with greenhouse gas emissions, which topic area is in the Checklist and the NOP indicates will be analyzed, and related issues of climate change. Accordingly, these issues should be considered as part of a holistic strategy to minimize wasteful, inefficient, or unnecessary consumption of energy resources during project construction and operation and associated greenhouse gas emissions and to mitigate their impacts on climate change. In particular, the City encourages the elimination of the use of natural gas in its proposed new buildings, as well as the transition of its existing facilities on the Reservation, and to consider the introduction of solar panel collection systems on rooftops and parking areas and parking structures to serve the energy needs of the Reservation.

Hazards and Hazardous Materials

4. Sonoma County has experienced three significant wildfire events in the past five years. With the ongoing drought in the State of California, the likelihood for additional wildfire events in the foreseeable future is extremely high. Indeed, wildfires have always been a part of the California landscape, only their intensity and frequency have increased. The TEIR should clearly discuss the plans for managing increased guests at the expanded facilities, including plans for evacuation routes, in order to ensure the proposed project and the expected increase in the number of patrons and vehicles does not impact evacuation routes and expose off-reservation people to a significant risk of loss, injury or death from wildfires. The TEIR should clearly describe and evaluate opportunities for coordinating with neighboring emergency management agencies including CalFire, the cities of Rohnert Park and Santa Rosa and the Rincon Valley, Rancho Adobe, Goldridge Fire, and Sonoma County Fire Districts, and identify measures the Tribe can undertake in partnership with these agencies to mitigate potentially significant impacts.

Water Resources

5. Please discuss in detail the potential impacts and mitigation on the Santa Rosa Plain groundwater basin (Basin) including the relationship of the proposed expansion to the recently adopted Groundwater Sustainability Plan (GSP) for the Basin. The GSP documents that groundwater storage is declining at a rate of 2,100 acre-feet per year and that there is potential for adverse effects to the Basin. The GSP outlines a range of actions and mitigation measures to address these conditions. The TEIR should clearly explain how the proposed expansion could exacerbate these identified impacts. The TEIR should clearly explain how the project impacts can be mitigated through funding implementation actions identified in the GSP or through other mitigation measures. If applicable, mitigation measures should include detailed descriptions of necessary modifications to existing water resource systems and potentially significant impacts associated with implementation of modifications to existing water resource systems must be analyzed and feasible mitigation identified. Further, please evaluate the feasibility of dual plumbing the proposed new facilities for use of recycled water in the event such a resource becomes available for use, such as in restrooms.

6. The TEIR should clearly describe the plan for wastewater treatment and disposal. Treatment and disposal of wastewater is currently the subject of a Joint Exercise of Powers Agreement by and between the City of Rohnert Park and the Federated Indians of the Graton Rancheria (Wastewater JEPA). The Wastewater JEPA only covers the Project as defined in the agreement, which is fully constructed. This new proposed project is a third expansion of the Resort and Casino and is not included in the Wastewater JEPA. The project is currently utilizing much of its available wastewater treatment and disposal capacity under the Wastewater JEPA. While the Wastewater JEPA included an option for the purchase of addition capacity, this option was not exercised and has since expired.

   As outlined in the Wastewater JEPA, the Reservation currently utilizes capacity in the City's main sewer outfall and a portion of the City's capacity rights in the Santa Rosa Subregional System's (Santa Rosa) treatment and disposal system. The City believes that these systems may have capacity to support the proposed expansion but utilizing that capacity will require amendments to existing agreements.

   The Wastewater JEPA also discusses the potential for recycled water to be provided to the Resort and Casino site. Since the execution of the Wastewater JEPA, the City has entered into a Recycled Water Producer-Distributor Agreement with Santa Rosa that describes the terms under the City took ownership of the recycled water system that serves users in the City and under which Santa Rosa (Producer) will provide recycled water to the City (Distributor). For a variety of reasons, Santa Rosa's recycled water system has capacity constraints and Santa Rosa imposed a limit on the amount of recycled water it will provide to the City through the Producer-Distributor Agreement. Under certain hydrologic conditions, the City currently utilizes all the recycled water allocated through the Producer- Distributor Agreement. However, increased flows from the proposed expansion of the Resort and Casino would directly result in an increased recycled water supply. The City supports the use of recycled water at the Graton Resort and Casino and believes that the recycled water generated by increased flows from the Graton Resort and Casino should be used to help offset the water demands of the Resort and Casino.

The TEIR should include a detailed discussion of the existing wastewater treatment and water recycling systems and agreements, including capacity allocations, and the new capacity requirements. Mitigation Measures should include detailed descriptions of the modifications to existing systems and agreements that would allow increased wastewater flows from the proposed Resort and Casino expansion to be treated and returned for beneficial reuse. Further, as alluded to at the outset, potentially significant impacts associated with implementation of modifications to existing sewer system facilities must be analyzed and feasible mitigation identified if necessary.

Land Use

7. The TEIR should clearly discuss the relationship between the proposed expansion and the City's adopted Wilfred-Dowdell and Northwest Specific Plans.

Noise

8. The TEIR should clearly include residential development and hotels within the City as sensitive receptors with respect to noise impacts from project construction and operation of the proposed project and should include mitigation for potential noise impacts. Among other matters, the analysis should evaluate the impact of noise generating mechanical equipment (e.g. air conditioners, fans, blowers, generators) and mitigate the noise impacts through design and installation of acoustical shields, covers and enclosures, as well as impose limitations on the day of the week and time of day during which construction activities can be undertaken as a means to mitigate impacts of construction noise on off-reservation persons and businesses.

9. The TEIR should provide full information on hours of operation, and examine noise impacts from its operation during sensitive hours, particularly nighttime.

Population and Housing

10. The TEIR should clearly describe the increased workforce necessary to support the expansion and should analyze the demand that this increased workforce will place on the regional housing stock, especially the region's affordable housing stock. TEIR mitigation measures should include reasonable provisions for increasing workforce housing in the region, payment of the affordable housing linkage fee in accordance with Chapter 3.36 of the City of Rohnert Park Municipal Code, or a combination thereof. Further, the City strongly encourages evaluation of a project alternative that includes the construction of work force housing to house some of its employees on the project site. See comment 22 under Alternatives.

11. Numerous studies have shown a causal link between problem gambling and homelessness, and the project proposes to add significant additional gaming area. Increased incidence of homelessness causes impacts on the environment in terms of unpermitted camping in public places and resultant public

health and safety impacts from unsanitary living conditions. Accordingly, the TEIR should analyze the impact of increased gaming on homelessness and identify measures to mitigate and address homelessness and its resulting impacts on the environment.

12. The TEIR should thoroughly analyze the likely need for construction workers to commute excessively long distances to the project site. The City's experience on large construction projects is that workers often travel from Solano County, the Central Valley, and beyond, distances that are not ordinary commuting distances. Mitigation measures should include consideration of housing workers locally during project construction, as well as the availability of such accommodations, as a means to mitigate the impact of the additional Vehicle Miles Traveled (VMT) and greenhouse gas emissions associated with these long commutes. Indeed, the analysis should evaluate the feasibility of using a portion of the existing project hotel facilities to temporarily house construction workers during the workweek.

Public Services

13. While the City is not the primary provider, the City currently provides public safety services via automatic aid and mutual aid agreements to the site of the proposed project in the form of fire protection, emergency medical service, and law enforcement and the proposed project will result in a proportional increase in the demand for services from these public safety service providers. The TEIR should describe the impacts on these local public service providers (i.e. fire protection, emergency medical service and law enforcement) that will result from the construction and operation of the proposed project and identify proposed measures for mitigating these impacts, including fiscal mitigation. In addition, the TEIR needs to evaluate the need for new or altered public safety facilities as a result of the increased demand on public safety services and fiscal mitigation to fund needed facility expansion and modification.

14. Please see comment 4 under Hazards and Hazardous Materials for the City's comment on analysis of wildfire issues.

Transportation and Traffic

15. The TEIR should clearly identify the existing performance of the regional transportation system in the vicinity of the project area, including the Level of Service experienced on Golf Course Drive, Commerce Boulevard and the Highway 101 interchange at Golf Course Drive, and the performance of these transportation systems based on build out of the proposed project.

16. The TEIR should analyze **both** the short-term construction impacts and long term operational impacts to traffic and the transportation system. Reasonable mitigation measures should include widening Golf Course Drive, extending Dowdell Avenue between Golf Course Drive and Business Park Drive (to complete an alternate route to Redwood Drive), improving the Highway 101 interchange and improving the signal control system and their efficacy should be fully analyzed.

17. An analysis of local transportation system both pre-and post-event for the 3,500 seat theater should be done including queuing analysis, delays, and Level of Service to inform mitigation measures to ensure the continued operation of local transportation systems for off-reservation persons and the safety of patrons and other motorists.

18. The proposed expansion project will be a regional draw and the TEIR should thoroughly analyze the increase in Vehicle Miles Traveled (VMT) that will result from the project. Reasonable mitigation measures including policy and fiscal support for regional transit systems (including SMART), last-mile solutions (including shuttle service to the Casino), support of Sonoma County Transit Authority's Regional VMT bank and financial support of transportation demand management programs that reduce VMT in the region should be proposed and their efficacy should be fully analyzed.

19. The traffic analysis should evaluate current conditions plus buildout of the surrounding areas with the addition of the proposed project, and necessary mitigation.

Utilities and Service Systems

20. Please see comments 5 and 6 under Water Resources.

Cumulative Impacts

21. The TEIR should analyze the impact of the proposed project in all issue areas including buildout of the City's proposed General Plan 2040 and Housing Element.

Alternatives

22. The TEIR should describe and evaluate a range of reasonable alternatives to the proposed project. While the City acknowledges that Section 11.8.1 (b) of the Compact provides that the analysis need not address alternatives that would cause the Tribe to forgo its right to engage in the gaming activities authorized by the Compact, it is worth noting that the Tribe is already engaging in such gaming activities and the proposed project seeks to expand those gaming activities. Accordingly, the TEIR should include a range of reasonable alternatives, including one that includes the construction of workforce housing on the project site to house some of the Tribe's employees on the project site as a means to mitigate impacts on housing, transportation and traffic, air quality and greenhouse gas emissions.

The City looks forward to reviewing the Draft TEIR. Please include the City in your list of interested parties to receive the Notice of Availability when the TEIR is available to review.

Sincerely,

Mary Grace Pawson, Development Services Director

C: Darrin Jenkins, City Manager
Michelle Marchetta Kenyon, City Attorney
Michael Biddle, City Attorney's Office
Jeff Beiswenger, Planning Manager

OFFICE OF THE COUNTY ADMINISTRATOR

COUNTY OF SONOMA

575 ADMINISTRATION DRIVE – ROOM 104A
SANTA ROSA, CALIFORNIA 95403-2888
TELEPHONE (707) 565-2431
FAX (707) 565-3778

SHERYL BRATTON
COUNTY ADMINISTRATOR

CHRISTINA RIVERA
ASSISTANT COUNTY ADMINISTRATOR

PETER BRULAND
DEPUTY COUNTY ADMINISTRATOR

BARBARA LEE
DEPUTY COUNTY ADMINISTRATOR

CHRISTEL QUERIJERO
DEPUTY COUNTY ADMINISTRATOR

May 4, 2022

Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: Graton Resort & Casino Notice of Preparation of a Tribal Environmental Impact Report

Federated Indians of Graton Rancheria,
On April 6, 2022, the County of Sonoma received the Notice of Preparation dated April 4, 2022 (NOP), for the Graton Resort & Casino Expansion Project (Proposed Project). The Proposed Project is to be built on an existing resort parking lot and includes approximately 144,000 square feet expansion of the casino floor, a new 5-level, 221 room hotel wing, new 5 level parking structure, 3,500 seat theater, expanded swimming pool area, a rooftop restaurant, an additional water tank and central plant addition.

The County has review the NOP and comments on the environmental issues are presented below. Community input received by the County is also included in Attachment A, Community Input. It should be noted that the County's ability to comment meaningfully on the scope of the project is limited by the lack of a full project description. *We request that recreation be added to the issue areas listed in the NOP TIER Scope*. Overall, we support the list of issue areas listed in the NOP TIER Scope. In order to fully assess potential impacts, we look forward to the TEIR including a complete and detailed description of the project issue areas including the following components:

1. Groundwater. Detailed discussion of the potential impacts and mitigation on the Santa Rosa Plain groundwater basin including the relationship of the proposed expansion to the recently adopted Groundwater Sustainability Plan (GSP) for the basin. The GSP documents that groundwater storage is declining at a rate of 2,100 acre-feet per year and that there is potential for adverse effects to the groundwater basin. The GSP outlines a range of actions and mitigation measures to address these conditions. To be optimally informative, the TEIR should clearly explain how the proposed expansion could exacerbate these identified impacts. The TEIR should clearly explain how the project impacts can be mitigated through funding implementation actions identified in the GSP or through other mitigation measures.

2. Stormwater Management. Redevelopment for a typical, non-tribal project would have to comply with the North Coast Regional Water Board's Municipal Separate Storm Sewer (MS4) Permit that covers all of the Laguna de Santa Rosa watershed. As this is a delegated federal Clean Water Act program that the North Coast Regional Water Board administers please discuss whether the tribe is required to submit stormwater permit applications directly to US EPA or otherwise comply directly with US EPA storm water regulations. Regardless, to be optimally informative, the TEIR should

consider the benefits of a robust low impact development and best management practice program for 100% water quality treatment and 100% volume detention.

3. Traffic. An expansion of this size will have impacts on traffic and roads. To be optimally informative, the TEIR should include a full traffic study.

4. Noise. To be optimally informative, the TEIR should include noise impacts during construction and operation.

5. Air quality, VMT, GHG. To be optimally informative, the TEIR should include air quality impacts during construction and subsequent operation and VMT/GHG. Mitigation to offset the increases in GHG due to the project should include a detailed analysis by a qualified consultant and a comprehensive plan on how to address impacts through agreed upon mitigation measures.

6. Biological Resources. To be optimally informative, the TEIR should include an analysis of impacts on biological and natural resources, and include appropriate mitigation measures. The TEIR should also consider Biological Mitigation Measures from Earlier Environmental Review, as part of its present analysis. Generally, the County encourages the use of proactive measures, such as best management practices (BMPs), surveys, construction windows, low impact development (LID), plans, testing and monitoring, to avoid, minimize and mitigate potentially significant environmental effects of the project. To clarify jurisdictional information, TEIR should identify local, state, and federal agencies consulted during the preparation of the TEIR and any required permits and standards applicable to the project. To ensure the TEIR provides an accurate picture of impacts, it should also analyze cumulative impacts associated with increased development both on and off of Tribal lands for reasonably anticipated future projects.

The County appreciates the opportunity to comment on this NOP and is interested in working with the Tribe to address the concerns and impacts raised in these comments. If you have any questions regarding these comments, please contact Intergovernmental Affairs Coordinator Marissa Montenegro at Marissa.montenegro@sonoma-county.org or 707-565-3771.

Sincerely,

SHERYL BRATTON
County Administrator

Attachments:
Attachment A, Community Input

Attachment A

Community Input

Comments received in response to Sonoma County request for comments regarding proposed Graton Casino Expansion.

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

May 4, 2022

County of Sonoma

Transmitted via email to: tribalaffairs@sonoma-county.org

To Whom It May Concern:

The purpose of this letter is to communicate the impacts to the Sonoma County Fire District from the proposed expansion project at the Graton Resort and Casino.

The Sonoma County Fire District is the provider of fire and emergency medical services to the Graton Resort and Casino. Our services are provided from our Fire Station 4 located on Todd Road.

Currently, 25% of fire station 4's emergency calls for service are to the Graton Resort and Casino. The volume of our emergency responses will undoubtedly increase with your expansion project the increased occupancy and visitors. The increase in emergency responses will impact our ability, and the ability of our fire service partners, to adequately serve your facility and the surrounding communities.

The Sonoma County Fire District has a long-standing strong relationship with the Federated Indians of Graton Rancheria, and we look forward to our ongoing collaboration and partnership. I have included a copy of the letter sent to the Federated Indians of Graton Rancheria concerning this expansion project for your reference.

It is our request that the County of Sonoma and the Federated Indians of Graton Rancheria will collaborate with the Sonoma County Fire District to support us in mitigating the impacts to the fire district from the proposed expansion project.

Sincerely,

Mark Heine
Fire Chief

Cc: President Steve Klick, Sonoma County Fire District Board of Directors

May 4, 2022

Chairman Sarris
Federated Indians of Graton Rancheria
Attention: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

Dear Chairman Sarris,

The Sonoma County Fire District appreciates the invitation to provide comments regarding the intended expansion project. The Sonoma County Fire District, and our predecessor agency Rincon Valley Fire District, is proud to be the primary fire and emergency medical services provider to the Graton Resort and Casino.

We formed in 2019 as the result of consolidating the Rincon Valley Fire District, Bennett Valley Fire District, Mountain Volunteer Fire Company, Windsor Fire District. Since 2019, we have added the Forestville Fire District, Russian River Fire District, and the Bodega Bay Fire District to our family. We are an independent fire district governed by our own elected Board of Directors and not associated with the County of Sonoma governance. We now serve more than 250 square miles in Sonoma County including the Graton Resort and Casino.

We deeply value and appreciate our long-standing relationship and look forward to our collaboration and partnership moving forward. We support your project and look forward to the opportunity to continue to serve you.

We are concerned that the expansion project will impact our ability to continue to provide the highest quality customer service to you and the surrounding communities that we serve. These impacts will begin when construction begins, and mitigation actions must be planned and provided well ahead of time.

Our fire station that serves you is Station 4 located on Todd Road. This fire station and its services will be impacted by your expansion project. The current Intergovernmental Mitigation Agreement between the Federated Indians of Graton Rancheria and the County of Sonoma is insufficient to mitigate this impact.

Currently, 25% of fire station 4's emergency calls for service are to the Graton Resort and Casino. The volume of our emergency responses will undoubtedly increase with your expansion project the increased occupancy and visitors. The increase in emergency responses will impact our ability, and the ability of our fire service partners, to adequately serve your facility and the surrounding communities.

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

The fire district is developing plans to enhance the services that we provide by rebuilding and expanding fire station 4 to add additional firefighter and Paramedic staffing to serve you, purchase specialized equipment for high rise and high occupancy buildings, and plan for future needs. These projects are likely to cost as much as $20 million which the fire district is not capable of funding independently.

We request an opportunity to meet with your leadership to discuss the impacts of your expansion project and to identify partnership opportunities to mitigate these impacts moving forward.

Respectfully Submitted,

Mark Heine
Fire Chief

Cc: President Steve Klick, Sonoma County Fire District Board of Directors

From:	re.minder@yahoo.com
To:	TribalAffairs
Subject:	Irony in gaming
Date:	Wednesday, May 4, 2022 7:45:34 AM

EXTERNAL

I find it ironic that the Federated Indians of Graton who are announcing this huge expansion, only a short time ago expressed strong opposition to Koi Nation's attempts to launch a casino in Windsor. Rather than one tribe trying to aggressively trying to dominate the local gaming landscape, should not the tribes be supportive of each other to share the wealth and success among all the tribes of the region?

If the Graton resort can accommodate such an expansion in the area, then surely there is room for comparable gaming space at another location without opposition. It seems disingenuous to block neighboring tribes from seeking to improve themselves while cashing in at their expense.

From: Rick
To: TribalAffairs
Subject: WATER USE??
Date: Tuesday, May 3, 2022 7:52:03 AM

EXTERNAL

We in the county are facing a severe water shortage for yet another year. The casino draws tremendous amounts of precious ground water, with little or no concern as to conservation. Adding another huge addition only adds to the depletion of the aquifer. Well owners are now being faced with yet another imposed fee, to pay for “administration” costs. HOW MUCH WILL THE CASINO PAY???
Eric Hieber

Sent from my iPad

From:	Dani Sheehan-Meyer3
To:	TribalAffairs
Subject:	Support for expansion of Graton Rancheria Casino expansion
Date:	Tuesday, May 3, 2022 8:11:53 AM

EXTERNAL

To whom it may concern:
I support the expansion for several reasons:

1. The location is perfectly situated and I always wished it to have an actual theatre.
2. I do not want to see any more casinos built so expanding what exists makes sense.
3. The Graton Rancheria tribe has always supported Sonoma county environmental issues and the SMART train.

In general, the Graton Rancheria is a great business, good neighbors and job creator. I don't think expansion changes the environmental issues negatively. It's been in the plan all along.

DANI SHEEHAN-MEYER
Freelance Marketing Professional
7790 Welter Lane • Sebastopol, CA 95472
cell 707.486.3387 • dsheehan@sonic.net
https://www.linkedin.com/in/clichenoe/

cc: info@gratonrancheria.com

From: Elaine Reichert
To: TribalAffairs
Subject: NO expansion
Date: Tuesday, May 3, 2022 10:04:20 AM

EXTERNAL

While I respect the tribe's right to earn money, the negative impacts from expanding their already enormous hotel/casino facility boggle the mind.
Most urgent impact is on WATER! We're already in a severe drought with increasingly scarce water for existing infrastructure. Where is their huge hotel going to get its water?
Traffic is already congested in that area with climate impacts from exhaust.
Please curb this plan. Enough is enough.
Thanks,
Elaine Reichert
San Rafael

From:	lloydart@gmail.com
To:	TribalAffairs
Subject:	Graton Resort and Casino
Date:	Tuesday, May 3, 2022 8:04:01 AM

EXTERNAL

I am concerned about light pollution from expanding the Graton Resort and Casino. Already, lights from the casino shine brighter than everything else across the valley. This is not Las Vegas. Light pollution is an environmental hazard. Stars of the night sky guide millions of birds, insects and bats on their migration routes. It is essential to design lighting to shine downward and only where needed, and to plant trees to block light from shining beyond the casino property.

I encourage the planners to design lighting that will shine downward and only where needed, and to plant trees to block light from shining beyond the casino property. Please do not contribute to light pollution.

Linda Lloyd
5019 Pressley Rd
Santa Rosa, CA 95404
llloydart@gmail.com
415-317-6896

From: Rose Cook
To: TribalAffairs
Subject: Graton Rancheria Expansion
Date: Tuesday, May 3, 2022 11:04:15 AM

EXTERNAL

How in good conscience can this even be considered? We are in a drought. The casino is already using over 82 million gallons of water per year. Their well is placed several hundred feet down ensuring they will have water while the community surrounding the casino are at risk of having their property become dry. There is no plan in place protect these properties when their wells run dry.
Once again this is about greed.
What happened to the Indegious People belief in protecting the environment? Is the earth no longer sacred to them?

Sent from my iPhone

From: pookipse
To: TribalAffairs
Subject: Graton expansion
Date: Tuesday, May 3, 2022 8:29:37 AM

EXTERNAL

The biggest concern should be about the water usage. I know they are on a well. But how many farmers and other people in the county have wells. Many of my friends have wells and they are not down 200 feet like Graton. It's a casino and hotel. Not a place trying to take care of a family or livestock.

I have nothing against gambling my whole concern is water usage.

Linda Spencer
Petaluma, CA

Sent from Mail for Windows

From: cecede7
To: TribalAffairs
Subject: Graton Casino
Date: Tuesday, May 3, 2022 8:39:16 AM

EXTERNAL

I think it's a great idea to expand the casino. Much better than building another one elsewhere.
And they are a great employer.
Cece DePaoli

Sent from Samsung Galaxy smartphone.

From: Nancy Lindell
To: TribalAffairs
Subject: Graton casino expansion
Date: Tuesday, May 3, 2022 9:55:39 AM

EXTERNAL

No! Traffic and water issues!!!!

From: m howser
To: TribalAffairs
Subject: Graton casino expansion
Date: Tuesday, May 3, 2022 10:12:28 AM

EXTERNAL

May 3, 2022

I strongly object to this expansion. I was stunned to read about this in the Press Democrat this morning. This expansion would use more water when water is getting more scarce every month.

If common sense prevailed, this expansion shouldn't even be a talking point. For some time, most of us have stopped our daily showers, have buckets under every faucet to collect water for either flushing our toilets, watering our landscaping and still watching our landscapes looking puny due to lack of irrigation. However much we try to save water, we are asked to save even more. Our ground water is disappearing at a faster rate than anticipated. There are other reasons not to expand, but this extreme drought is reason enough.

Again, I strongly object to this expansion.

M. HOWSER
PO Box 597
Cloverdale CA 95425

From: Sarah Sparks
To: TribalAffairs
Subject: Gratin expansion
Date: Tuesday, May 3, 2022 6:36:26 AM

EXTERNAL

Hello,

My name is Sarah Sparks and I live in Rohnert Park. I’m concerned about adding additional hotel space because it will consume valuable water resources during a time of persistent drought. People outside of the area are unlikely to practice the same water conservation measures as people who live here. Adding a larger swimming pool is another drain on water resources.

I haven’t seen the details of the expanded gaming floor, but i would hope a full environmental impact report will be completed and it does not negatively impact existing wildlife.

Thank you,

Sarah Sparks

Sent from my iPhone

From:	stephen owens
To:	TribalAffairs
Subject:	Expansion
Date:	Tuesday, May 3, 2022 5:17:34 AM

EXTERNAL

It is big enough. No on expansion.
Stephen Owens

From: Dr. S Garcia
To: TribalAffairs; hairmasters@icloud.com
Subject: Expansion
Date: Tuesday, May 3, 2022 11:03:31 AM

EXTERNAL

You all have done a wonderful job and made Sonoma County a better place. Just follow the path that built the first phase of your complex and environmental issues are met in our opinion. Glad to attend any meeting on your behalf. You have our vote and support. I will contact our Supervisor Hopkins today and give voice to purpose of your swift approval.

Steve and Annette Garcia Owners HairMasters
6980 McKinley Ave
Sebastopol, CA 95472
707-829-2443

Sent from Mail for Windows

CITY OF COTATI

May 3, 2022

Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

SUBJECT: City of Cotati Comments on the Notice of Preparation on the Proposed Expansion of the Graton Casino and Associated Facilities

To whom it may concern,

In response to the Notice of Preparation (NOP) for the Tribal Environmental Impact Report (TEIR), the City of Cotati (City) understands that the Federated Indians of Graton Rancheria (Tribe) intends to study the expansion of the Graton Casino and associated facilities (Casino), including a Casino floor expansion (approximately 144,000 square feet), a new 5-level, 221-room hotel wing, a new 5-level parking structure, a new 3,500 seat theater, an expanded swimming pool area, a rooftop restaurant, an additional water tank, and a central plant addition.

The City has several concerns with a further expansion of the Casino, including:

1. The potential project and cumulative impact on groundwater resources on municipal wells and on the local groundwater basin within the larger Santa Rosa Basin Groundwater Management Plan; and
2. The potential project and cumulative impact on traffic and circulation, including the impact on Highway 116; and
3. The potential project and cumulative impact on greenhouse gas emissions; and
4. The potential project and cumulative impact on public services, including the Cotati Police Department (crime) and Rancho Adobe Fire Prevention District (fire and medical calls); and
5. The potential project and cumulative impact on the availability of affordable housing, particularly in the Cotati and Rohnert Park area to staff the expanded Casino.

If you have any questions, or need further clarification on these concerns, please contact Damien O'Bid, City Manager at dobid@cotaticity.org or 707.665.3622.

Sincerely,

Mark Landman
Mayor

From: Dorothy
To: TribalAffairs
Subject: casino growth
Date: Tuesday, May 3, 2022 8:15:04 AM

EXTERNAL

Okay by me but only if they can guarantee a water source to accommodate more customers and usage.

Sent from Mail for Windows

From: Dan Schultz
To: TribalAffairs
Subject: Casino expansion
Date: Tuesday, May 3, 2022 8:42:27 PM

EXTERNAL

My name is Daniel Schultz and I am a Cotati resident. I am opposed to any expansion of the casino or other amenities on the property. It is already the largest in Northern California! I have concerns about the added environmental impact the expansion would have on water. I moved to Sonoma county because it is a rural community filled with natural beauty and farmland. The casino brings with it urban issues that our rural community is not set up to handle. Also, I am a homeowner and studies show that the value of real estate properties next to casinos drop between a 2% and 10% in the net value of the property. We don't want to lose our rural charm any more than we already have. Please leave it the size it is. Thank you for your consideration.

From: Cristhyan Alfrao
To: TribalAffairs
Subject: Resident email regarding Casino Expansion
Date: Monday, May 2, 2022 8:16:47 PM

EXTERNAL

To the leaders of Rohnert Park,

The casino is already a huge place for gamblers and it does not need to be any bigger; our city is already burdened with some of the negative aspects of the casino and expanding it will only aggravate those issues.

Please reject the Casino’s expansion proposal on behalf of the residents of Rohnert Park.

Cristhyan Alfaro.

Sent from my iPhone

From: Amy Pamatmat
To: TribalAffairs
Date: Monday, May 2, 2022 4:17:47 PM

EXTERNAL

My name is Amy Pamatmat and I am a Cotati resident. I am opposed to any expansion of the casino or other amenities on the property. It is already the largest in Northern California! I have concerns about the added environmental impact the expansion would have on water. I moved to Sonoma county because it is a rural community filled with natural beauty and farmland. The casino brings with it urban issues that our rural community is not set up to handle. Also, I am a homeowner and studies show that the value of real estate properties next to casinos drop between a 2% and 10% in the net value of the property. We don't want to lose our rural charm any more than we already have. Please leave it the size it is. Thank you for your consideration.

Amy Pamatmat
404 Wilford Ln.
Cotati, CA 94931

From: Brad Bergum
To: TribalAffairs
Subject: Graton Expansion
Date: Monday, May 2, 2022 3:46:43 PM

EXTERNAL

I’m fully in favor of their expansion. They want to build a new performing arts center and bring more lodging to Sonoma County (along with the related taxes that come with it) and they are paying for it all themselves? That sounds great to me. Thanks!

Brad Bergum
CFO/Board Member
www.visitepicenter.com
Office: 707-757-9016
Mobile: 415-948-4724

From:	walter loniak
To:	TribalAffairs
Subject:	Graton Casino Expansion
Date:	Monday, May 2, 2022 9:55:37 PM

EXTERNAL

This expansion plan is a terrible idea. The existing casino is bad enough, causing traffic concerns, crime increase,
Covid-related health concerns and environmental depredation, including severe night time light pollution. An expansion would
only increase these negative impacts on communities in Sonoma County. The casino and hotel and parking structures
are already too large and out of proportion to the local business footprint, and should not be permitted to grow larger.
The "tribe" forced the existing casino/hotel/ parking structure down the throats of the majority of Sonoma county residents,
who were opposed to the casino --- built on wetlands --- in the first place! Please do not permit a second round of this
Las Vegas $ managed $ monstrosity to be built in our community!
Thank you very much.
Walter Loniak
Sebastopol, CA

From:	Kathy Korlin
To:	TribalAffairs
Subject:	feedback on casino expansion
Date:	Monday, May 2, 2022 3:51:57 PM

To whom it may concern;

Offering my 2 cents, as a frequent visitor to Graton Casino. So frequent, in fact that I had to ban myself after digging a very deep hole in my retirement funds. After one year passed & my ban was lifted back in November, I am back to visiting at least 3 times a week, alway, always, Ieaving a loser, literally & figuratively. I wonder how many others feel terrible after leaving their 'happy' place. I have many issues but one of them is struggling with a gambling addiction. I think by expanding, you are merely feeding my addiction & others as well. I wonder how much of your massive profits you donate to fixing the problems of addiction.

Say NO to expansion. (wishful thinking).

Kathleen Korlin
player # 3040811

From: Rick
To: TribalAffairs
Subject: Casino Expansion
Date: Monday, May 2, 2022 4:01:36 PM

EXTERNAL

Where will the water come from?

Sent from my iPad

From: Laura
To: TribalAffairs
Subject: Expansion
Date: Sunday, May 1, 2022 7:13:39 PM

EXTERNAL

I oppose the expansion of the casino due to the impact of sensitive habitats. The casino is already extremely lucrative. The homeless issue near the casino needs to be dealt with before expanding multi billion dollar industries.

From: christine hoex
To: TribalAffairs
Subject: Expansion of Graton Rancheria Resort & Casino
Date: Monday, April 25, 2022 12:22:52 PM

EXTERNAL

To the Federated Indians of Graton Rancheria, and the country of Sonoma

I am not in support of an expansion of the Graton Rancheria Resort & Casino. Please consider that we are still in severe drought conditions. Expansion would have to include a bigger water budget and expansion is incongruent with water conservation efforts.

More hotel rooms, a big theatre, and parking garage all aim to expand visits and lodging to the casino. This brings with it an ongoing burden of green house gas emissions, and the construction itself brings a carbon burden.

I would not support any expansion or new development of any resort or wine event center at this time of climate emergency and water scarcity. I think the county development needs to focus on affordable housing. Housing for homeless. Fire prevention by home hardening. Energy and water efficient buildings and homes.

Christine and Tom Hoex
Santa Rosa Ca 95407

From:	James & Julie Hildbold
To:	TribalAffairs
Subject:	Input Graton Rancheria Resort and Casino
Date:	Tuesday, April 19, 2022 6:40:37 PM

EXTERNAL

Graton Rancheria Resort and Casino

Casinos have nothing to offer to family communities in the quiet neighborhoods in Rohnert Park, and now Windsor and Larkfield. Only and extreme degree of infrastructure supplied by the Casino owners and developers would make it in the least palatable.

Consider: the traffic already overwhelming, the shortage of water, and the lack of housing.
Only infrastructure support by Graton Rancheria would help:
-dig wells
- build a parkway near the casino or an area nearby to improve the movement of traffic
- build an elementary school or a tech school center
- provide funds to build a new Santa Rosa Administration Center

Without these and more – there is not incentive for our already burdened communities to speak in favor of a casino or a casino extension.

James and Julie Hildbold
308 Sejong Lane
Santa Rosa, CA

From:	James & Julie Hildbold
To:	TribalAffairs
Subject:	Casino is not giving enough back to community
Date:	Tuesday, April 19, 2022 6:47:20 PM

Graton Rancheria Resort and Casino

Casinos have nothing to offer to family communities in the quiet neighborhoods in Rohnert Park, and now Windsor and Larkfield. Only and extreme degree of infrastructure supplied by the Casino owners and developers would make it in the least palatable.

Consider: the traffic already overwhelming, the shortage of water, and the lack of housing.
Only infrastructure support by Graton Rancheria would help:
-dig wells
- build a parkway near the casino or an area nearby to improve the movement of traffic
- build an elementary school or a tech school center
- provide funds to build a new Santa Rosa Administration Center

The "$9 million a year" is not nearly enough to cope with the major costs of traffic and road building, not to mention crime mitigation associated with having a gambling club in our towns.

Without these and more – there is not incentive for our already burdened communities to speak in favor of a casino or a casino extension.

From Press Democrat:
A year after the casino opened, Rohnert Park police records showed an increase in crime in the area, including car theft, fraud, DUI, narcotics and prostitution, with the increases ranging from significant to minimal.

The tribe has an agreement to pay a total of $251 million over 20 years to Rohnert Park for public safety, education and other community services.

Separately, the tribe agreed to pay Sonoma County about *$9 million a year* for 20 years to address negative impacts of the casino.

The city is evaluating the expansion proposal, Jenkins said.

From: Dee Jeffers-Kalder
To: TribalAffairs
Subject: Casino
Date: Sunday, April 17, 2022 6:26:13 PM

EXTERNAL

PLEASE, NO MORE CASINOS IN SONOMA COUNTY!!!

From: Robert B Souza
To: TribalAffairs
Subject: Grayton casino expansion
Date: Saturday, April 16, 2022 9:14:58 AM

EXTERNAL

While this expansion will increase employment opportunites and temporary construction jobs for the area. This expansion will increase traffic, and infrastructure issues for everything south. The impact to Cotati, and Rohnert Park will bear the most of the increase volume.The addition of the 3500 seat theatre will impact the evening traffic for the obvious special events. 3500 seats represents 1700 vehicles arriving for a specific event, these all impact on local public safety. Has the county looked at a public records act request for CHP, Rohnert Park, Santa Rosa, Cotati, and Sonoma Sheriff as the number of DUI's, auto thefts, accidents, domestic violence, and thefts related to the current property. With increase volume brings increase crime.

This expansion plan will in essence double the size of the current property and thus double the impact of public safety, and its related costs. The roads and infrastructure are all single lanes each way to access the casino (Stony Point & Wilfred).

The Grayton Ranchera has contributed a lot to Sonoma County and I wish the tribe well. But how much is enough, and how will its decision impact on our area.

Robert Souza

From: Carl Wahl
To: TribalAffairs; Lynda Hopkins
Subject: Graton Resort & Casino expansion
Date: Friday, April 15, 2022 7:26:44 PM

EXTERNAL

To Whom It May Concern & Supervisor Hopkins,

My wife and I are opposed to the proposed expansion of the Graton Resort & Casino.

The three main things Sonoma County is becoming known for are wine, cannabis, and gambling. This is not something to be proud of.

Cannabis and gambling, attract a higher crime element than that found in the general population. This in turn strains the ability of law enforcement to counteract the increased crime. We feel that mitigating the crime that would result from the proposed expansion, as well as this project's associated water, waste, air pollution, and traffic issues, will take more resources than can be bought with the increased tax revenue.

Sonoma County doesn't need an additional 144,000 sq. ft. gambling area, nor does it need more hotel rooms placing additional strains on our dwindling water supply.

We therefore respectfully request that Sonoma County take the morally and environmentally correct action and oppose this unneeded expansion.

Sincerely yours,
Carl & Margaret Wahl
3585 Joy Road
Occidental

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

May 4, 2022

Chairman Sarris
Federated Indians of Graton Rancheria
Attention: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

Dear Chairman Sarris,

The Sonoma County Fire District appreciates the invitation to provide comments regarding the intended expansion project. The Sonoma County Fire District, and our predecessor agency Rincon Valley Fire District, is proud to be the primary fire and emergency medical services provider to the Graton Resort and Casino.

We formed in 2019 as the result of consolidating the Rincon Valley Fire District, Bennett Valley Fire District, Mountain Volunteer Fire Company, Windsor Fire District. Since 2019, we have added the Forestville Fire District, Russian River Fire District, and the Bodega Bay Fire District to our family. We are an independent fire district governed by our own elected Board of Directors and not associated with the County of Sonoma governance. We now serve more than 250 square miles in Sonoma County including the Graton Resort and Casino.

We deeply value and appreciate our long-standing relationship and look forward to our collaboration and partnership moving forward. We support your project and look forward to the opportunity to continue to serve you.

We are concerned that the expansion project will impact our ability to continue to provide the highest quality customer service to you and the surrounding communities that we serve. These impacts will begin when construction begins, and mitigation actions must be planned and provided well ahead of time.

Our fire station that serves you is Station 4 located on Todd Road. This fire station and its services will be impacted by your expansion project. The current Intergovernmental Mitigation Agreement between the Federated Indians of Graton Rancheria and the County of Sonoma is insufficient to mitigate this impact.

Currently, 25% of fire station 4's emergency calls for service are to the Graton Resort and Casino. The volume of our emergency responses will undoubtedly increase with your expansion project the increased occupancy and visitors. The increase in emergency responses will impact our ability, and the ability of our fire service partners, to adequately serve your facility and the surrounding communities.

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

The fire district is developing plans to enhance the services that we provide by rebuilding and expanding fire station 4 to add additional firefighter and Paramedic staffing to serve you, purchase specialized equipment for high rise and high occupancy buildings, and plan for future needs. These projects are likely to cost as much as $20 million which the fire district is not capable of funding independently.

We request an opportunity to meet with your leadership to discuss the impacts of your expansion project and to identify partnership opportunities to mitigate these impacts moving forward.

Respectfully Submitted,

Mark Heine
Fire Chief

Cc: President Steve Klick, Sonoma County Fire District Board of Directors

8200 Old Redwood Highway, Windsor, CA 95492 Ph: 707-838-1170
www.sonomacountyfd.org

SONOMA COUNTY
FIRE DISTRICT

Sonoma County Fire District
8200 Old Redwood Hwy
PO Box 530
Windsor, CA 95492-0530

RECEIVED
MAY 04 2022

Federated Indians of Graton Rancheria
Attention: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

SANTA ROSA PLAIN
GROUNDWATER
SUSTAINABILITY AGENCY

May 4, 2022 SENT VIA: EMAIL

Via email: tribalaffairs@sonoma-county.org
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

SUBJECT: Santa Rosa Plain Groundwater Sustainability Agency Comments on the Graton Resort & Casino Expansion Tribal Environmental Impact Report Notice of Preparation

To whom it may concern:

Thank you for the opportunity to review the Notice of Preparation for the proposed Casino Expansion project. We understand that the Graton Rancheria (Tribe) is preparing a Tribal Environmental Impact Report (TEIR) to examine potential off-tribe environmental impact of a proposed expansion of the existing resort and casino located on the western edge of the City of Rohnert Park and within the Santa Rosa Plain Groundwater Basin.

The Santa Rosa Plain is designated by the California Department of Water Resources as a medium priority groundwater basin, and as such must comply with the Sustainable Groundwater Management Act (SGMA). The Santa Rosa Plain Groundwater Sustainability Agency (GSA) is a public agency formed to sustainably manage groundwater in the Santa Rosa Plain groundwater basin. The agency was formed in June 2017 and has a Board of Directors, an administrator and an advisory committee. The Tribe has been participating as an advisory committee member. The GSA is working to achieve sustainability with input from all stakeholders in the Basin.

The proposed project would add an additional 144,00 square feet to the existing casino and intensify hotel uses, adding 221 rooms, a 5-level parking garage, a 3,500-seat theater, swimming pool, and restaurant. The project would increase water use and wastewater generation.

Please discuss in detail the potential impacts and mitigation on the Santa Rosa Plain groundwater basin including the relationship of the proposed expansion to the adopted Groundwater

Sustainability Plan (GSP) for the basin (January 2022) Groundwater Sustainability Plan | Santa Rosa Plain Groundwater Sustainability Agency. The GSP documents that groundwater storage is declining at a rate of 2,100 acre-feet per year and outlines a range of actions and mitigation measures to address these conditions. The TEIR should fully analyze how the proposed expansion could exacerbate these identified impacts. The TEIR should identify feasible mitigation measures to address project impacts, including funding implementation actions identified in the GSP.

Thank you for the opportunity to comment of the NOP. We look forward to participating in the public process and reviewing the TEIR when it is available to the public. If you have any questions or would like to discuss these comments, please contact Andy Rodgers at Arodgers@santarosaplaingroundwater.org.

Sincerely,

Andy Rodgers, Administrator
SANTA ROSA PLAIN
GROUNDWATER SUSTAINABILITY AGENCY

STATE OF CALIFORNIA **Gavin Newsom, *Governor***

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

April 15, 2022

Kt Alonzo
Federated Indians of the Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

Re: 2022040067, Graton Resort & Casino Expansion Project, Sonoma County

Dear Mr. Alonzo:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.

b. The lead agency contact information.

c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).

d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.

b. Recommended mitigation measures.

c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

a. Type of environmental review necessary.

b. Significance of the tribal cultural resources.

c. Significance of the project's impacts on tribal cultural resources.

d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.

b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

- **a.** The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
- **b.** A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

- **a.** Avoidance and preservation of the resources in place, including, but not limited to:
  - **i.** Planning and construction to avoid the resources and protect the cultural and natural context.
  - **ii.** Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
- **b.** Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
  - **i.** Protecting the cultural character and integrity of the resource.
  - **ii.** Protecting the traditional use of the resource.
  - **iii.** Protecting the confidentiality of the resource.
- **c.** Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
- **d.** Protecting the resource. (Pub. Resource Code §21084.3 (b)).
- **e.** Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
- **f.** Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

- **a.** The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
- **b.** The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
- **c.** The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
   - **a.** The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
   - **b.** Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
   - **a.** If part or all of the APE has been previously surveyed for cultural resources.
   - **b.** If any known cultural resources have already been recorded on or adjacent to the APE.
   - **c.** If the probability is low, moderate, or high that cultural resources are located in the APE.
   - **d.** If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
   - **a.** The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
   - **b.** The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:

a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.

c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Cameron.Vela@nahc.ca.gov.

Sincerely,

Cameron Vela

Cameron Vela
Cultural Resources Analyst

cc: State Clearinghouse

May 3, 2022

Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Dr Suite 300
Rohnert Park CA 94928

Subject: Graton Casino expansion

I strongly object to this expansion. I was stunned to read about this in the Press Democrat this morning. This expansion would use more water when water is getting more scarce every month.

If common sense prevailed, this expansion shouldn't even be a talking point. For some time, most of us have stopped our daily showers, have buckets under every faucet to collect water for either flushing our toilets, watering our landscaping and still watching our landscapes looking puny due to lack of irrigation. However much we try to save water, we are asked to save even more. Our ground water is disappearing at a faster rate than anticipated. There are other reasons not to expand, but this extreme drought is reason enough.

Again, I strongly object to this expansion.

M. HOWSER
PO Box 597
Cloverdale CA 95425

May 3, 2022

Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Dr Suite 300
Rohnert Park, CA 94928

Subject: Graton Casino expansion

I strongly object to this expansion. I was stunned to read about this in the Press Democrat this morning. This expansion would use more water when water is getting more scarce every month.

If common sense prevailed, this expansion shouldn't even be a talking point. For some time, most of us have stopped our daily showers, have buckets under every faucet to collect water for either flushing our toilets, watering our landscaping and still watching our landscapes looking ugly due to lack of irrigation. However much we try to save water, we are asked to save even more. Our ground water is disappearing at a faster rate than anticipated. There are other reasons not to expand, but this extreme drought is reason enough.

Again, I strongly object to this expansion.

M. HOWSER
PO BOX 501
Cloverdale, CA 95425

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

April 15, 2022

Kt Alonzo
Federated Indians of the Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

Re: 2022040067, Graton Resort & Casino Expansion Project, Sonoma County

Dear Mr. Alonzo:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.

b. The lead agency contact information.

c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).

d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.

b. Recommended mitigation measures.

c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

a. Type of environmental review necessary.

b. Significance of the tribal cultural resources.

c. Significance of the project's impacts on tribal cultural resources.

d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.

b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

- **a.** The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
- **b.** A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

- **a.** Avoidance and preservation of the resources in place, including, but not limited to:
  - **i.** Planning and construction to avoid the resources and protect the cultural and natural context.
  - **ii.** Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
- **b.** Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
  - **i.** Protecting the cultural character and integrity of the resource.
  - **ii.** Protecting the traditional use of the resource.
  - **iii.** Protecting the confidentiality of the resource.
- **c.** Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
- **d.** Protecting the resource. (Pub. Resource Code §21084.3 (b)).
- **e.** Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
- **f.** Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

- **a.** The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
- **b.** The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
- **c.** The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:

a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.

c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Cameron.Vela@nahc.ca.gov.

Sincerely,

Cameron Vela

Cameron Vela
Cultural Resources Analyst

cc: State Clearinghouse

SANTA ROSA PLAIN
GROUNDWATER
SUSTAINABILITY AGENCY

May 4, 2022 SENT VIA: EMAIL

Via email: tribalaffairs@sonoma-county.org
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

SUBJECT: Santa Rosa Plain Groundwater Sustainability Agency Comments on the Graton Resort & Casino Expansion Tribal Environmental Impact Report Notice of Preparation

To whom it may concern:

Thank you for the opportunity to review the Notice of Preparation for the proposed Casino Expansion project. We understand that the Graton Rancheria (Tribe) is preparing a Tribal Environmental Impact Report (TEIR) to examine potential off-tribe environmental impact of a proposed expansion of the existing resort and casino located on the western edge of the City of Rohnert Park and within the Santa Rosa Plain Groundwater Basin.

The Santa Rosa Plain is designated by the California Department of Water Resources as a medium priority groundwater basin, and as such must comply with the Sustainable Groundwater Management Act (SGMA). The Santa Rosa Plain Groundwater Sustainability Agency (GSA) is a public agency formed to sustainably manage groundwater in the Santa Rosa Plain groundwater basin. The agency was formed in June 2017 and has a Board of Directors, an administrator and an advisory committee. The Tribe has been participating as an advisory committee member. The GSA is working to achieve sustainability with input from all stakeholders in the Basin.

The proposed project would add an additional 144,00 square feet to the existing casino and intensify hotel uses, adding 221 rooms, a 5-level parking garage, a 3,500-seat theater, swimming pool, and restaurant. The project would increase water use and wastewater generation.

Please discuss in detail the potential impacts and mitigation on the Santa Rosa Plain groundwater basin including the relationship of the proposed expansion to the adopted Groundwater

Sustainability Plan (GSP) for the basin (January 2022) Groundwater Sustainability Plan | Santa Rosa Plain Groundwater Sustainability Agency. The GSP documents that groundwater storage is declining at a rate of 2,100 acre-feet per year and outlines a range of actions and mitigation measures to address these conditions. The TEIR should fully analyze how the proposed expansion could exacerbate these identified impacts. The TEIR should identify feasible mitigation measures to address project impacts, including funding implementation actions identified in the GSP.

Thank you for the opportunity to comment of the NOP. We look forward to participating in the public process and reviewing the TEIR when it is available to the public. If you have any questions or would like to discuss these comments, please contact Andy Rodgers at Arodgers@santarosaplaingroundwater.org.

Sincerely,

Andy Rodgers, Administrator
SANTA ROSA PLAIN
GROUNDWATER SUSTAINABILITY AGENCY

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

May 4, 2022

Chairman Sarris
Federated Indians of Graton Rancheria
Attention: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

Dear Chairman Sarris,

The Sonoma County Fire District appreciates the invitation to provide comments regarding the intended expansion project. The Sonoma County Fire District, and our predecessor agency Rincon Valley Fire District, is proud to be the primary fire and emergency medical services provider to the Graton Resort and Casino.

We formed in 2019 as the result of consolidating the Rincon Valley Fire District, Bennett Valley Fire District, Mountain Volunteer Fire Company, Windsor Fire District. Since 2019, we have added the Forestville Fire District, Russian River Fire District, and the Bodega Bay Fire District to our family. We are an independent fire district governed by our own elected Board of Directors and not associated with the County of Sonoma governance. We now serve more than 250 square miles in Sonoma County including the Graton Resort and Casino.

We deeply value and appreciate our long-standing relationship and look forward to our collaboration and partnership moving forward. We support your project and look forward to the opportunity to continue to serve you.

We are concerned that the expansion project will impact our ability to continue to provide the highest quality customer service to you and the surrounding communities that we serve. These impacts will begin when construction begins, and mitigation actions must be planned and provided well ahead of time.

Our fire station that serves you is Station 4 located on Todd Road. This fire station and its services will be impacted by your expansion project. The current Intergovernmental Mitigation Agreement between the Federated Indians of Graton Rancheria and the County of Sonoma is insufficient to mitigate this impact.

Currently, 25% of fire station 4's emergency calls for service are to the Graton Resort and Casino. The volume of our emergency responses will undoubtedly increase with your expansion project the increased occupancy and visitors. The increase in emergency responses will impact our ability, and the ability of our fire service partners, to adequately serve your facility and the surrounding communities.

SONOMA COUNTY FIRE DISTRICT

Honesty ♦ Respect ♦ Integrity

The fire district is developing plans to enhance the services that we provide by rebuilding and expanding fire station 4 to add additional firefighter and Paramedic staffing to serve you, purchase specialized equipment for high rise and high occupancy buildings, and plan for future needs. These projects are likely to cost as much as $20 million which the fire district is not capable of funding independently.

We request an opportunity to meet with your leadership to discuss the impacts of your expansion project and to identify partnership opportunities to mitigate these impacts moving forward.

Respectfully Submitted,

Mark Heine
Fire Chief

Cc: President Steve Klick, Sonoma County Fire District Board of Directors

SONOMA COUNTY
FIRE DISTRICT

Sonoma County Fire District
8200 Old Redwood Hwy
PO Box 530
Windsor, CA 95492-0530

RECEIVED
MAY 04 2022

Federated Indians of Graton Rancheria
Attention: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

May 3, 2022

Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Dr Suite 300
Rohnert Park CA 94928

Subject: Graton Casino expansion

I strongly object to this expansion. I was stunned to read about this in the Press Democrat this morning. This expansion would use more water when water is getting more scarce every month.

If common sense prevailed, this expansion shouldn't even be a talking point. For some time, most of us have stopped our daily showers, have buckets under every faucet to collect water for either flushing our toilets, watering our landscaping and still watching our landscapes looking puny due to lack of irrigation. However much we try to save water, we are asked to save even more. Our ground water is disappearing at a faster rate than anticipated. There are other reasons not to expand, but this extreme drought is reason enough.

Again, I strongly object to this expansion.

M. HOWSER
PO Box 597
Cloverdale CA 95425

May 3, 2022

Federated Indians of Graton Rancheria
Attn. NOP Comments
6400 Redwood Dr Suite 300
Rohnert Park CA 94928

Subject: Graton Casino expansion

I strongly object to this expansion. I was stunned to read about this in the Press Democrat this morning. This expansion would use more water when water is getting more scarce every month.

If common sense prevailed, this expansion shouldn't even be a talking point. For some time, most of us have stopped our daily showers, have buckets under every faucet to collect water for either flushing our toilets, watering our landscaping and still watching our landscapes looking puny due to lack of irrigation. However much we try to save water, we are asked to save even more. Our ground water is disappearing at a faster rate than anticipated. There are other reasons not to expand, but this extreme drought is reason enough.

Again, I strongly object to this expansion.

M. HOWSER
PO Box 567
Cloverdale CA 95425

APPENDIX D

GRADING AND DRAINAGE STUDY

Grading and Drainage Plan
for
Graton Resort & Casino Expansion Project

March 2023

Prepared for:

Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
(707) 566-2288

Prepared by:

Lochsa Engineering
6345 South Jones Boulevard
Suite 100
Las Vegas, Nevada 89118
(702) 365-9312

Lochsa Job No. 221100

Grading and Drainage Plan
For
Graton Resort & Casino Expansion Project

TABLE OF CONTENTS

APPENDICES

1. INTRODUCTION

This report presents preliminary site grading and storm drainage plans for the proposed Graton Resort & Casino Expansion Project in Sonoma County, located at the southeast corner of the Wilfred Avenue and Langner Avenue. (See Figure 1)

The plans were based upon architectural layout A. This report and associated plans are intended to provide information for the environmental analysis of the project. The final architectural design and site development plan for the project may require revisions to the plans presented in this report.

The project site is covered by Flood Insurance Rate Map (FIRM) for the Sonoma County, California (and incorporated areas), Community Panel Number: 06097C0876F (effective date: July 19, 2022) designates the Expansion Project to be located entirely outside of the 100-year floodplain of the Bellevue Wilfred Flood Control Channel. (See Figure 2)

The construction of the existing Graton Resort & Casino (structures, surface parking and access roads) has utilized the necessary fill to ensure the improvements remain well above the water surface elevations through the adjacent Bellevue-Wilfred floodplain. The previous drainage plan for the existing Graton Resort & Casino also provided the design for the existing two detention basins along the south side of the property. These existing detention basins provide the required capacity to attenuate the increase in peak flows due to the existing Graton Resort & Casino. As will be discussed, the grading and drainage plan with this project incorporates fill to be able for the building expansion to match the finished flood (FF) elevation for the existing Resort & Casino. The proposed drainage plan is designed to match the established existing drainage plan for the Graton Resort & Casino. In addition, since the proposed Expansion Project occupies an area that is already entirely impervious (i.e. existing structures, surface parking and access roads), the project will not result in any increase in stormwater peak flows from existing condition. Thus, no additional detention basins or stormwater attenuation is being proposed with this Expansion Project.

As will be discussed, to comply with the Low Impact Development (LID) requirements, the drainage plan for the Existing Graton Hotel & Casino utilized **Roadside Bioretention facilities** that were sized following the San Francisco Bay Regional Water Quality Control Board's requirements. However, the majority of Sonoma County (including City of Rohnert Park) is subject to the requirements promulgated by the North Coast Regional Water Quality Control Board. **Therefore, the sizing calculations for the roadside bioretention facilities are being revised in this report to comply with the current LID requirements by the North Coast Regional Water Quality Control Board for the City of Rohnert Park and Sonoma County.**

The City of Rohnert Park's MS4 permit requires compliance with the City of Santa Rosa and County of Sonoma's LID Technical Design Manual (dated 2017, revised December 2020; will be referred to as the **LID Manual**). **Therefore, per the LID Manual, the City of Santa Rosa Storm Water BMP Calculator is being utilized to examine the design of the existing/revised roadside bioretention facilities.** Per the LID Manual, since the Expansion Project consists of new and/or replaced impervious area that is over 1.0acre, **100% Volume Capture** (100% capture and retention of the volume of runoff generated by 1.0" of rain over a 24-hour period) and **treatment** BMPs are required. However, the October 2011 Geotechnical Investigation for the Graton Hotel & Casino (by GEOCON Consultants, Inc.) identified the presence of predominantly clayey soils and potentially high seasonal groundwater level. **Thus, the geotechnical information indicated that it would be infeasible to use infiltration facilities to achieve volume capture.**

As shown in the output of the **BMP Storm Water Calculator**, since it has been determined that infiltration is not feasible, the design requirement for the subject Roadside Bioretention facilities is "**Treatment Only**". The BMP Storm Water Calculator is utilized to examine all existing and modified roadside bioretention facilities impacted by the proposed Expansion Project. As shown in the output from the BMP Storm Water Calculation, the existing and revised roadside bioretention achieve the required 100% treatment. **Thus, the proposed Expansion Project complies with the current LID requirements by the North Coast Regional Water Quality Control Board for the City of Rohnert Park and Sonoma County.**

2. EXISTING SITE DESCRIPTION

The Expansion Project occupies approximately 33.75 acres of existing surface parking and access roads. The project area site is bounded to the north by the existing surface parking of the Graton Resort & Casino, to the west by the existing Graton Resort & Casino building and surface parking, to the east by existing grazing and pasture land and the south by existing access road.

The subject area of the existing Graton Resort & Casino site was constructed to generally slope to the south. The drainage plan for the existing improvements was provided in the "Final Stormwater Management Plan for Graton Rancheria Casino" (hereinafter will be referred to as the '**Original Study'**). Thus, proposed drainage analysis in the Original Study generally represents the existing drainage condition for the subject Expansion Project. As shown in the attached referenced Original Grading and Drainage Plan (Sheets C2.1, C3.2, C3.4, C3.5, C3.6, C3.7 and C3.9) and referenced Exhibit 6 (Proposed Site Drainage Areas), the Original Study delineated the Graton Rancheria improvements into 12 drainage basins (labeled as A through L).

As shown in referenced Exhibit 6, the proposed Expansion Project falls within original Drainage Basins A, B, C, D, I, J and K. In addition to the surface area of each drainage basin, the Original Study determined the additional roof area contributing to each basin (based on the roof drain plan from the Architect). Thus, the Original Study determined the entire Drainage Management Area (**DMA**) for each basin by adding the surface and the roof areas.

The drainage plan for the existing Graton Resort & Casino was designed to satisfy the National Pollutant Discharge Elimination System (NDPES) Permit (Order No. R1-2009-0050) issued by the California Regional Water Quality Control Board, North Coast Regional, for the City of Santa Rosa, the County of Sonoma and the Sonoma County Water Agency. At the time of the Original Study, the NDPES Permit applied to all sites that drained to a Sonoma County owned/maintained storm drain system. The NDPES Permit required the new development and redevelopment projects (both public and private) to adopt Standard Urban Storm Water Mitigation Plan (SUSMP) that prioritize the implementation of Low Impact Development (LID) techniques in site design. The NDPES Permit also required new development and redevelopment projects to implement an approved Hydromodification Control Plan to develop post-construction Best Management Practices (BMPs) that protect the receiving waters. These BMPs were required to be sized for the two-year 24-hour rain event that keeps post-construction peak discharge, peak velocity and peak duration at or below respective pre-construction levels. The BMPS were also required to ensure that post-construction stormwater runoff volume is the same as the pre-construction stormwater volume for flows up to the 85th percentile 24-hour storm and larger storms, where adverse impacts to receiving waters are possible.

To comply with the Low Impact Development (LID) requirements, the Original Study proposed Roadside Bioretention facilities (were labeled in the Original Study as flow-through planter facilities) for each DMA. Thus, several sections of the site were constructed to drain northerly, easterly or southerly towards several roadside bioretention facilities. The existing improvements also include a north-south mainline storm drain system that conveys the storm flows from several laterals for roof drains and roadside bioretention facilities throughout the existing site.

For the existing Graton Hotel & Casino, the roadside bioretention facilities were sized following the Contra Costa County sizing factor procedure for treatment and flow control (governed by the San Francisco Bay Regional Water Quality Control Board's requirements). However, the majority of Sonoma County (including City of Rohnert Park), is subject to the requirements promulgated by the North Coast Regional Water Quality Control Board. **Therefore, as will be discussed in Section 6, the calculations for the existing and revised roadside bioretention facilities are being revised in this report to comply with the current LID requirements for the City of Rohnert Park and Sonoma County.**

In addition to any onsite attenuation provided through the roadside bioretention facilities, two large onsite detention basins were constructed to mitigate the peak flow increases (along the south side of Graton Resort & Casino). As shown in the Original Study, approximately 18.50acre-ft of existing detention storage is utilized during the 100-year storm events.

3. FLOODPLAIN INFORMATION

The project site is covered by Flood Insurance Rate Map (FIRM) for the Sonoma County, California (and incorporated areas), Community Panel Number: 06097C0876F, effective date: July 19, 2022. The project site is outside the Special Flood Hazards Area (SFHA). Review of the FIRM indicates that the project site is located entirely within Zone "X" (unshaded), described by FEMA as: "Areas determined to be outside the 0.2% annual chance floodplain. Figure 2 in the Appendix C illustrates the location of the site on a portion of the referenced FIRM.

4. STORMWATER HYDROLOGY

As mentioned previously, the drainage plan for the existing Graton Resort & Casino also provided the design for the existing two large detention basins along the south side of the property. These existing detention basins provide the required capacity to attenuate the increase in peak flows due to the existing Graton Resort & Casino. The grading and drainage plan with this Expansion Project is designed to match the established existing drainage plan for the Graton Resort & Casino.

The proposed Expansion Project occupies an area that is already entirely impervious, consisting of existing structures, surface parking and access roads. Therefore, the project will not result in any increase in the 100-year storm runoff peak flows from the existing condition. Thus, no additional detention capacity or storm runoff attenuation is being proposed with this Expansion Project. Relevant information from the previous hydrologic analysis for the existing Graton Resort & Casino is included with this report to illustrate that the two existing detention basins (along the south side of the project) provide the required mitigation for the runoff increase from pre- Graton Resort & Casino condition.

As shown in the attached referenced information from the "Graton Resort & Casino Stormwater Plan" (being referred to as the Original Study), hydrologic investigation was performed to estimate the 100-year storm runoff for the pre-and post- Graton Resort & Casino. The Original Study utilized the XPSWMM computer program to develop Soil Conservation

Service (SCS) synthetic unit hydrographs. The hydrographs were analyzed to determine the volume of storm drainage detention required.

The soil type was obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey. The rainfall losses due to infiltration, interception, etc. are represented using the SCS curve number (CN) method. The SCS method categorizes the soils into four hydrologic groups as A, B, C and D. The developed area of the site is entirely underlain by hydrologic soil group 'D' defined as soils with "very low infiltration rate, high runoff potential". The SCS curve numbers (CN) for the developed site were determined utilizing the hydrologic soil groups as defined by the NRCS, Technical Release 55 (TR55).

For the post- Graton Resort & Casino, a minimum time of concentration of 10 minutes was used in the Original Study to account for roof to gutter time. The hydrologic parameters and the 100-year peak flows for the Pre- and Post-Graton Resort & Casino conditions were summarized in the attached referenced Appendix B from the Original Study.

5. STORMWATER DETENTION ANALYSIS

As discussed previously, to mitigate offsite impacts, the stormwater drainage system for the existing Graton Resort & Casino was designed to attenuate the peak flow from the developed site to predevelopment peak flows. To accomplish this, the drainage plan for the existing Graton Resort & Casino included two large detention basins (along the south side of the property). These existing detention basins provide the required capacity to attenuate the increase in peak flows due to the existing Graton Resort & Casino.

The grading and drainage plan with this Expansion Project is designed to match the established existing drainage plan for the Graton Resort & Casino. The proposed Expansion Project occupies an area that is already entirely impervious, consisting of existing structures, surface parking and access roads. Therefore, the Expansion Project will not result in any increase in the 100-year storm runoff peak flows from the existing condition. Thus, no additional detention capacity or storm runoff attenuation is required with this Expansion Project. Relevant information from the previous hydrologic analysis for the existing Graton Resort & Casino is included with this report to illustrate that the two existing detention basins (along the south side of the project) provide the required mitigation for the post- Graton Resort & Casino condition.

6. DRAINAGE IMPROVEMENTS

As discussed previously, to comply with the LID requirements, the Original Study proposed Roadside Bioretention facilities (were labeled in the Original Study as flow-through planter facilities). As shown in the referenced improvements plans for the existing Graton Hotel& Casino, the roadside bioretention facilities were labeled as Water Quality (**WQ**) basins 1 through 19. As shown in referenced Exhibit 6 (Proposed Site Drainage Areas), the Original Study delineated the constructed Graton Hotel & Casino property into 12 Drainage Management Areas (DMAs), labeled as A through L. **As shown in reference Exhibit 6, the proposed Expansion**

Project falls within original DMAs A, B, C, D, I, J and K. In addition to the surface area of each DMA, the Original Study determined the additional roof area contributing to each DMA (based on the roof drain plan from the Architect). Thus, the Original Study determined the entire area for each DMA by adding the surface and the roof areas.

As shown in referenced Exhibit 6, the DMAs were constructed to drain towards several roadside bioretention facilities. For the existing Graton Hotel & Casino, the roadside bioretention facilities were sized following the Contra Costa County sizing factor procedure for treatment and flow control (governed by the San Francisco Bay Regional Water Quality Control Board's requirements). **However, the majority of Sonoma County (including City of Rohnert Park), is subject to the requirements promulgated by the North Coast Regional Water Quality Control Board. Therefore, the calculations for the roadside bioretention facilities are being revised in this report to comply with the current LID requirements for the City of Rohnert Park and Sonoma County.**

The Expansion Project propose improvements within the existing Graton Resort & Casino DMAs A, B, C, D, I, L, J and K. The Expansion Project will eliminate roadside bioretention WQ11 and WQ18 and reduce the area for WQ13 and WQ14. Therefore, the proposed improvements require the re-delineation of these DMAs, as well as re-routing of portion of the stormwater runoff to utilize the available additional capacity of the existing roadside bioretention facilities. The improvements will also include additional hydraulic connections between existing roadside bioretention facilities, to utilize the additional capacity of bioretention facilities. The improvements will also include the relocation of the existing storm drain system to accommodate the revised locations for the roof drains and the laterals from the flow-through planters.

As shown in the attached **Exhibit DR1 and Table 1**, the area covered by the proposed improvements are delineated as DMAs B1, B2, B3, Cr, Dr, Lr, Jr, K1 and Kr. DMA B1, B2 and B3 generally provide a re-delineation of existing referenced DMAs A and B. Referenced DMA A is eliminated and is now a portion of DMA B2. **DMAs Cr, Dr, Jr and Kr generally represents revised delineation of existing referenced DMAs C, D, J and K, respectively**. DMA K1(0.39acres) represents an additional area that is now added to existing referenced DMA K. However, since K1 represents entirely pervious landscaping area, the added area will not require any additional water quality treatment.

As mentioned previously, the calculations for the roadside bioretention facilities are being revised to comply with the current LID requirements by the North Coast Regional Water Quality Control Board for the City of Rohnert Park and Sonoma County. The City of Rohnert Park's MS4 permit requires compliance with the City of Santa Rosa and County of Sonoma's LID Technical Design Manual (dated 2017, revised December 2020; will be referred to as the **LID Manual**). **Therefore, per the LID Manual, the City of Santa Rosa Storm Water BMP Calculator is being utilized to examine the design of the existing/revised roadside bioretention facilities.**

Per the LID Manual, since the Expansion Project consists of new and/or replaced impervious area that is over 1.0acre, **100% Volume Capture** (100% capture and retention of the volume of runoff generated by 1.0" of rain over a 24-hour period) and **treatment** BMPs. However, as discussed in Section 2.5 (Geotechnical Constraints) from the Original Study, the October 2011 Geotechnical Investigation for the Graton Hotel & Casino (by GEOCON Consultants, Inc.) identified the presence of predominantly clayey soils and potentially high seasonal groundwater level. **Thus, the geotechnical information indicated that it would be infeasible to use infiltration facilities to achieve volume capture.**

Section 6.19.4 of the Geotechnical Report states, "The soil conditions at the site (highly expansive, low permeability clays) are not conductive to water infiltration devices such as vegetated swales. However, LID devices can be installed to reduce velocity and the amount of water entering storm drain system. The LID devices should be properly constructed to prevent water infiltration into the surrounding soil. If water infiltrates the expansive soils, distress may be caused to adjacent pavements, flatwork or structures. **Vegetated swales and basin areas (if used) should be lined with an impermeable liner to reduce infiltration**."

As shown in the output of the **BMP Storm Water Calculator**, since it has been determined that infiltration is not feasible, the design requirement for the subject Roadside Bioretention facilities is "**Treatment Only**". The BMP Storm Water Calculator is utilized to examine all existing and modified roadside bioretention facilities impacted by the proposed Expansion Project. Thus, the BMP Storm Water Calculator is utilized for roadside bioretention facilities labeled as WQ 3, 1, 2 &13r (since they are hydraulically connected), WQ 4, WQ 5, WQ 12, WQ 14r and WQ 10. As shown in the output from the BMP Storm Water Calculation, the existing and revised roadside bioretention achieve the required 100% treatment. **Thus, the proposed Expansion Project complies with the current LID requirements by the North Coast Regional Water**

Quality Control Board for the City of Rohnert Park and Sonoma County.

The proposed and existing roadway bioretention facilities maintain the same design bottom area/elevation and high flow bypass grates sizes/elevations. Thus, similar to the existing condition, the 100-year maximum water surface elevations within the roadside bioretention facilities are expected to remain contained, as described in the Original Study. In addition, the maximum 100-year outflow through the storm drain outlets and mainline is expected to resemble the Original storm drain values. Thus, the existing and relocated segment of the storm drain mainline will remain to provide sufficient capacity, similar to the Original values.

Similar to the existing Graton Resort & Casino improvements, the proposed Expansion Project complies with the LID requirements. In addition, the proposed Expansion Project will not increase existing 100-year runoff exiting the Graton Resort & Casino or alter the existing drainage pattern. The project also does not impact or encroach onto the existing two large detention basins along the south side of the Graton Resort & Casino. Thus, the project will not result in any impact to the existing off-site erosion or siltation. Therefore, the Expansion Project will not result or require the construction of new stormwater detention facilities.

6.1 Overland Drainage Release

As the project is developed, an overland drainage will be created to allow the property to drain under overflow conditions. Similar to the existing pattern, the overland drainage release will be around the south perimeter of the site.

6.2 Detention Basin Grading

Exhibit DR1 shows the location of the existing two detention basins along the south side of Graton Resort & Casino. Similar to the existing improvements, the proposed improvements comply with the stormwater quality requirement. In addition, the proposed Expansion Project will not increase existing 100-year runoff exiting the Graton Resort & Casino or alter the existing drainage pattern. The project also does not impact or encroach onto these existing two detention basins. Therefore, the Expansion Project will not require the construction of any additional detention basins. The existing two detention basins will remain to provide the sufficient capacity, as in the existing condition.

6.3 Building and Parking Lot Grading and Drainage

It is estimated that 8,500 cubic yards of earthwork will be required to develop the Expansion Project. Onsite excavation will yield approximately 1,000 CYD of fill material. An additional 7,500 CYD of material will need to be imported to achieve the design grades. The import material is available locally from nearby quarries. The fill can be imported with 100-150 trucks per day with each truck carrying 12 cubic yards of dirt. It is estimated that the duration of the importation of fill will be approximately 1 week.

Onsite drainage systems will consist of an underground piped drainage system. Inlets will be placed at appropriate intervals to capture runoff and convey to the detention basins. Roof leaders should be connected directly to the pipe system and parking lots should be constructed with a 1% minimum slope and 5% maximum slope toward the inlets.

7. EROSION CONTROL

An erosion control plan will be developed with the primary intent to decrease pollutants entering the water columns, with a secondary intent of trapping pollutants before they exit the site.

A Storm Water Pollution Prevention Plan (SWPPP) should be prepared as part of the project to provide a level of protection equivalent to full compliance with the EPA requirements.

8. SUMMARY

The grading and drainage plan with this Expansion Project is designed to match the established existing drainage plan for the Graton Resort & Casino. The proposed Expansion Project occupies an area that is already entirely impervious, consisting of existing structures, surface parking and access roads. Therefore, the project will not result in any increase in the 100-year storm runoff peak flows from the existing condition. Thus, no additional detention capacity or storm runoff attenuation is required with this Expansion Project.

As discussed previously, to comply with the LID requirements, the Original Study proposed Roadside Bioretention facilities (were labeled in the Original Study as flow-through planter facilities). In addition, to mitigate off-site impacts, the stormwater drainage system for the existing Graton Resort & Casino included two large detention basins (along the south side of the property). These existing detention basins provide the required capacity to attenuate the increase in peak flood flows due to the existing Graton Resort & Casino. The Expansion Project does not impact or encroach onto these existing two large detention basins. Thus, the project will not result in any impact to the existing off-site erosion or siltation.

The onsite excavation yield would create a small portion of fill necessary to achieve the design grades. An additional 7,500 CYD of material will need to be imported. In addition, an overland drainage release for the property can be maintained around the south perimeter of the developed site.

BMP STORM WATER CALCULATOR OUTPUT

City of Santa Rosa WATER

STORM WATER CALCULATOR

LID BMP Summary Page & Site Global Values

Project Information:

Project Name: Graton Resort and Casino Expansion
Address/Location: 288 Golf Course Drive, Rohnert Park, CA 94928
Designer: Guy Morris
Date: February, 2023

Site Information:

Mean Seasonal Precipitation (MSP) of Project Site: 30.00 (inches)
K=MSP/3(K= 1.00

Impervious area - pre development: 1,319,432.4 ft^2
Impervious area - post development: 1,319,432.4 ft^2

Based upon the pre and post development impervious area, the post construction BMP requirement is:

Treatment Only

Summary of Saved BMP Results:

		Tributary Area		Requirements		BMP Design Results						
							Hydromodification Control		Flow Base Treatment		Delta Volume Capture	
	BMP ID:	Tributary Area (ft^2.)	Runoff Reduction Measures (Y/N)	Type of Requirement Met	Type of BMP Design	Percent Achieved	Required $V_{Hydromod}$ (ft^3)	Achieved (ft^3)	Required Q Treatment (cfs)	Achieved (ft^3)	Required Vdelta (ft^3)	Achieved (ft^3)
1	WQ 3,1,2&13r	441,698	No	100% Vertical Flow Treatment	Priority 3: P3-04 Roadside Bioretention - Curb Opening	116.1			2.1294	2.4715		
2	WQ 4	256,133	No	100% Vertical Flow Treatment	Priority 3: P3-04 Roadside Bioretention - Curb Opening	121.6			1.2348	1.5021		
3	WQ 5	49,658	No	100% Vertical Flow Treatment	Priority 3: P3-04 Roadside Bioretention - Curb Opening	104.1			0.2394	0.2493		
4	WQ 12	89,734	No	100% Vertical Flow Treatment	Priority 3: P3-04 Roadside Bioretention - Curb Opening	108.0			0.4326	0.4671		
5	WQ 14r	40,511	No	100% Vertical Flow Treatment	Priority 3: P3-04 Roadside Bioretention - Curb Opening	142.5			0.1953	0.2784		
6	WQ 10	441,698	No	100% Vertical Flow Treatment	Priority 3: P3-04 Roadside Bioretention - Curb Opening	110.7			2.1294	2.3573		
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

City of Santa Rosa WATER

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: Graton Resort and Casino Expansion

BMP ID: WQ 3,1,2&13r

BMP Design Criteria: Treatment Only

Type of BMP Design: Priority 3: P3-04 Roadside Bioretention - Curb Opening

BMP's Physical Tributary Area: 441,698.4 ft^2

Description/Notes: The Tributary Area is the sum of DMAs B1, B2 and B3. The total Roadside Bioretention area is the sum of areas for Water Quality (WQ) Basins 3, 1, 2 and 13r, as they are hydraulically connected.

100% Treatment

$Q_{TREATMENT}$ = 2.1294 cfs

Post surface type: Asphalt

C_{POST}: 0.70

User Composite post development C_{POST}: 0.00

User Input $I_{Historical}$: 0.00 in./hr.

Treatment Factor (Tf): 2 Calculated

$I_{Design\ Storm}$: 0.20 in./hr.

BMP Sizing 100% Treatment Vertical

Percent of Goal Achieved = 116.07 %

Infiltration rate of the specified BMP soil: 5.00 in./hr.

Depth of drainage pipe: 3.50 ft

BMP Length: 711.80 ft

BMP Width: 30.00 ft

City of Santa Rosa WATER

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: Graton Resort and Casino Expansion

BMP ID: WQ 4

BMP Design Criteria: Treatment Only

Type of BMP Design: Priority 3: P3-04 Roadside Bioretention - Curb Opening

BMP's Physical Tributary Area: 256,132.8 ft^2

Description/Notes:

100% Treatment

$Q_{TREATMENT}$ = 1.2348 cfs

Post surface type: Asphalt

C_{POST}: 0.70

User Composite post development C_{POST}: 0.00

User Input $I_{Historical}$: 0.00 in./hr.

Treatment Factor (Tf): 2 Calculated

$I_{Design\ Storm}$: 0.20 in./hr.

BMP Sizing 100% Treatment Vertical

Percent of Goal Achieved = 121.65 %

Infiltration rate of the specified BMP soil: 5.00 in./hr.

Depth of drainage pipe: 3.50 ft

BMP Length: 288.40 ft

BMP Width: 45.00 ft

City of Santa Rosa WATER

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: Graton Resort and Casino Expansion

BMP ID:	WQ 5	
BMP Design Criteria:	Treatment Only	
Type of BMP Design:	Priority 3: P3-04 Roadside Bioretention - Curb Opening	
BMP's Physical Tributary Area:	49,658.4	ft^2
Description/Notes:		

100% Treatment

$Q_{TREATMENT}$ = 0.2394 cfs

Post surface type:	Asphalt				
C_{POST}:	0.70				
User Composite post development C_{POST}:	0.00		Treatment Factor (Tf):	2	Calculated
User Input $I_{Historical}$:	0.00	in./hr.	$I_{Design\ Storm}$:	0.20	in./hr.

BMP Sizing 100% Treatment Vertical

Percent of Goal Achieved = 104.14 %

Infiltration rate of the specified BMP soil:	5.00	in./hr.
Depth of drainage pipe:	3.50	ft
BMP Length:	107.70	ft
BMP Width:	20.00	ft

City of Santa Rosa WATER

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: Graton Resort and Casino Expansion

BMP ID:	WQ 12
BMP Design Criteria:	Treatment Only
Type of BMP Design:	Priority 3: P3-04 Roadside Bioretention - Curb Opening
BMP's Physical Tributary Area:	89,733.6 ft^2
Description/Notes:	

100% Treatment

$Q_{TREATMENT}$ = 0.4326 cfs

Post surface type:	Asphalt
C_{POST}:	0.70
User Composite post development C_{POST}:	0.00
User Input $I_{Historical}$:	0.00 in./hr.

Treatment Factor (Tf):	2 Calculated
$I_{Design\ Storm}$:	0.20 in./hr.

BMP Sizing 100% Treatment Vertical

Percent of Goal Achieved = 107.98 %

Infiltration rate of the specified BMP soil:	5.00 in./hr.
Depth of drainage pipe:	3.50 ft
BMP Length:	115.31 ft
BMP Width:	35.00 ft

City of Santa Rosa WATER

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: Graton Resort and Casino Expansion

BMP ID:	WQ 14r
BMP Design Criteria:	Treatment Only
Type of BMP Design:	Priority 3: P3-04 Roadside Bioretention - Curb Opening
BMP's Physical Tributary Area:	40,510.8 ft^2
Description/Notes:	

100% Treatment

$Q_{TREATMENT}$ = 0.1953 cfs

Post surface type:	Asphalt
C_{POST}:	0.70
User Composite post development C_{POST}:	0.00
User Input $I_{Historical}$:	0.00 in./hr.

Treatment Factor (Tf):	2 Calculated
$I_{Design\ Storm}$:	0.20 in./hr.

BMP Sizing 100% Treatment Vertical

Percent of Goal Achieved = 142.53 %

Infiltration rate of the specified BMP soil:	5.00 in./hr.
Depth of drainage pipe:	3.50 ft
BMP Length:	160.33 ft
BMP Width:	15.00 ft

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: Graton Resort and Casino Expansion

BMP ID: WQ 10

BMP Design Criteria: Treatment Only

Type of BMP Design: Priority 3: P3-04 Roadside Bioretention - Curb Opening

BMP's Physical Tributary Area: 441,698.4 ft^2

Description/Notes:

100% Treatment

$Q_{TREATMENT}$ = 2.1294 cfs

Post surface type: Asphalt

C_{POST}: 0.70

User Composite post development C_{POST}: 0.00

User Input $I_{Historical}$: 0.00 in./hr.

Treatment Factor (Tf): 2 Calculated

$I_{Design\ Storm}$: 0.20 in./hr.

BMP Sizing 100% Treatment Vertical

Percent of Goal Achieved = 110.70 %

Infiltration rate of the specified BMP soil: 5.00 in./hr.

Depth of drainage pipe: 3.50 ft

BMP Length: 1,018.35 ft

BMP Width: 20.00 ft

Table 1

Revised Roadside Bioretention Parameters

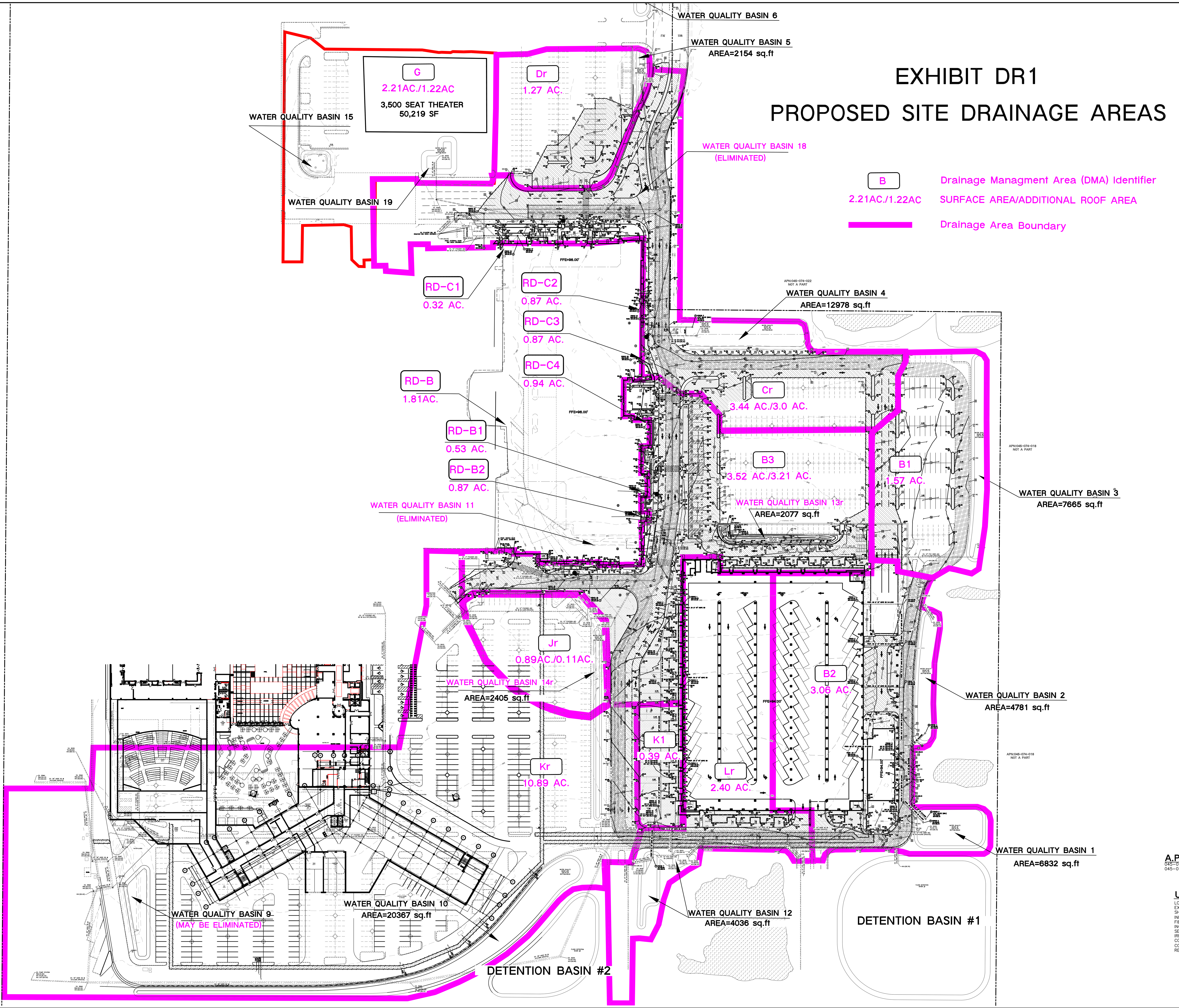
Table 1: Revised Roadside Bioretention Parameters

Drainage Management Area Identifier	Flow- Through Planter/Water Quality Basin Number	Drainage Management Area (acres)	DMA (impervious area, acres)	Actual Avg. IMP Area (ft^2)
B1	3	1.57	1.30	7665
B2	1,2	3.06	2.61	11613
B3	13r	6.73	6.23	2077
B1,B2,B3	**3,1,2,13r**	**11.36**	**10.14**	**21354**
Cr	**4**	6.44	5.88	**12978**
Dr	**5**	1.27	1.14	**2154**
Lr	**12**	2.40	2.06	**4036**
Jr	**14r**	1.00	0.93	**2405**
K1	10	0.39	0.00	
Kr	**10**	10.89	10.14	**20367**
				4611
Total:		***33.74***	***30.29***	**63293**

Exhibit DR1

Proposed Site Drainage

EXHIBIT DR1
PROPOSED SITE DRAINAGE AREAS



A.P.N.:
045–073–009, 045–073–006, 045–073–007, 045–074–023, 045–074–024

UTILITY NOTE:
LOCHSA ENGINEERING ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS PLAN ARE FROM THE BEST AVAILABLE INFORMATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES, INCLUDING BUT NOT LIMITED TO, THE WATER, FIRE, SANITARY SEWER, STORM SEWER, TELEPHONE, POWER, GAS, AND IRRIGATION LINES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. IF CONFLICT EXISTS IN THE FIELD, THE CONTRACTOR IS TO NOTIFY THE PROJECT ARCHITECT, OWNER'S REPRESENTATIVE AND THE PROJECT ENGINEER IMMEDIATELY.

BERGMAN WALLS & ASSOCIATES
709 VALLE VERDE COURT, HENDERSON, NEVADA 89014

Consultant
Lochsa engineering
6345 South Jones Blvd.
Suite 100
Las Vegas, NV 89118
Phone (702) 365-9312
Fax (702) 365-9317
www.lochsa.com

Project Name
GRATON RESORT AND CASINO
EXPANSION CORE AND SHELL
ROHNERT PARK, CALIFORNIA

No.	Date	Description
	12/15/2022	PERMIT ISSUE

Seal

Title
CIVIL ENGINEERING
GRADING SHEET

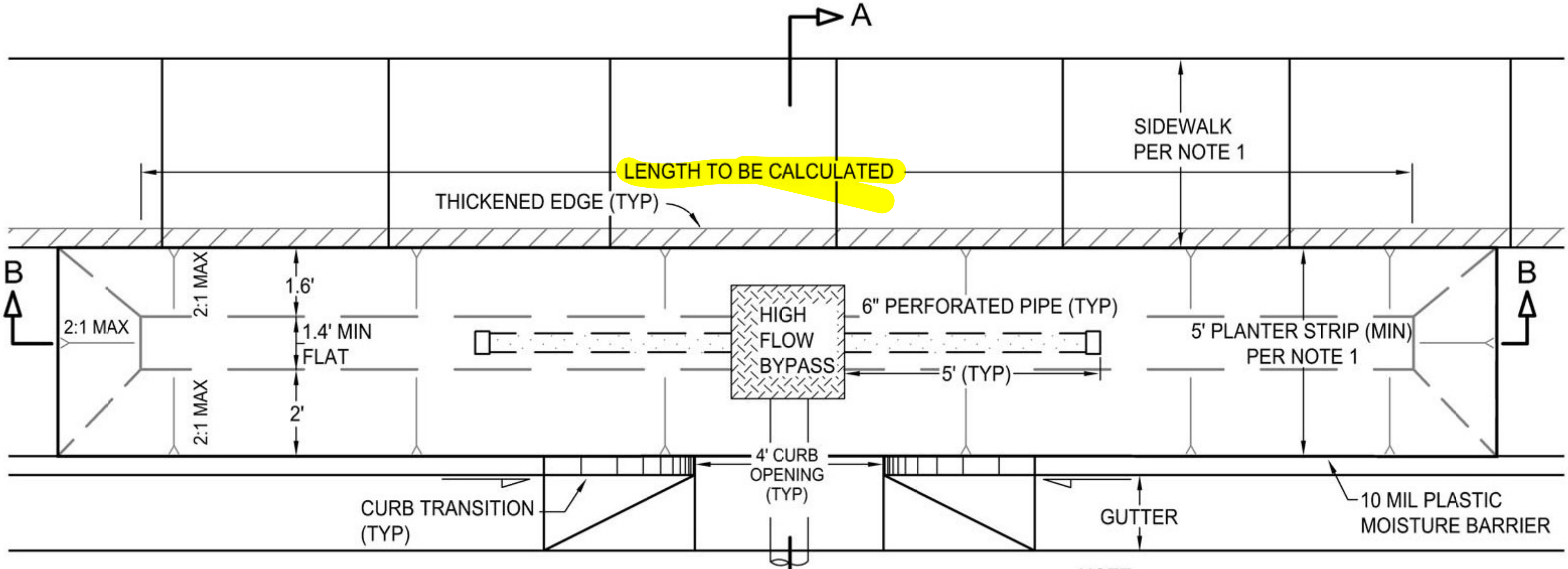
Project Number
221100

Drawn & Checked by
LOCHSA ENGINEERING

Issue Date
12/15/2022

Sheet Number
DR1

PRIORITY 3 DESIGNS

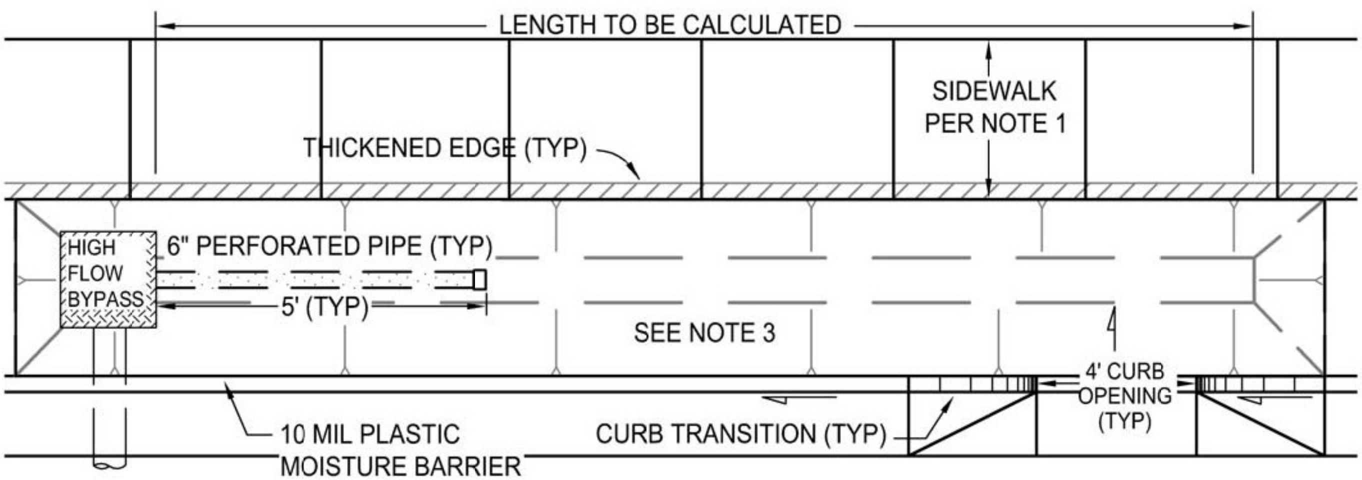


PLAN

TYPE A - CURB OPENING AT LOW POINT

NOTE:

1. SIDEWALK, GUTTER AND PLANTER WIDTHS PER APPLICABLE GOVERNING AGENCY STANDARDS (TYP).
2. 6" PERFORATED PIPE TO BE SET IN BOTTOM OF TREATMENT AREA.
3. TYPE A MINIMUM DIMENSIONS AND GRADES APPLY TO TYPE B.

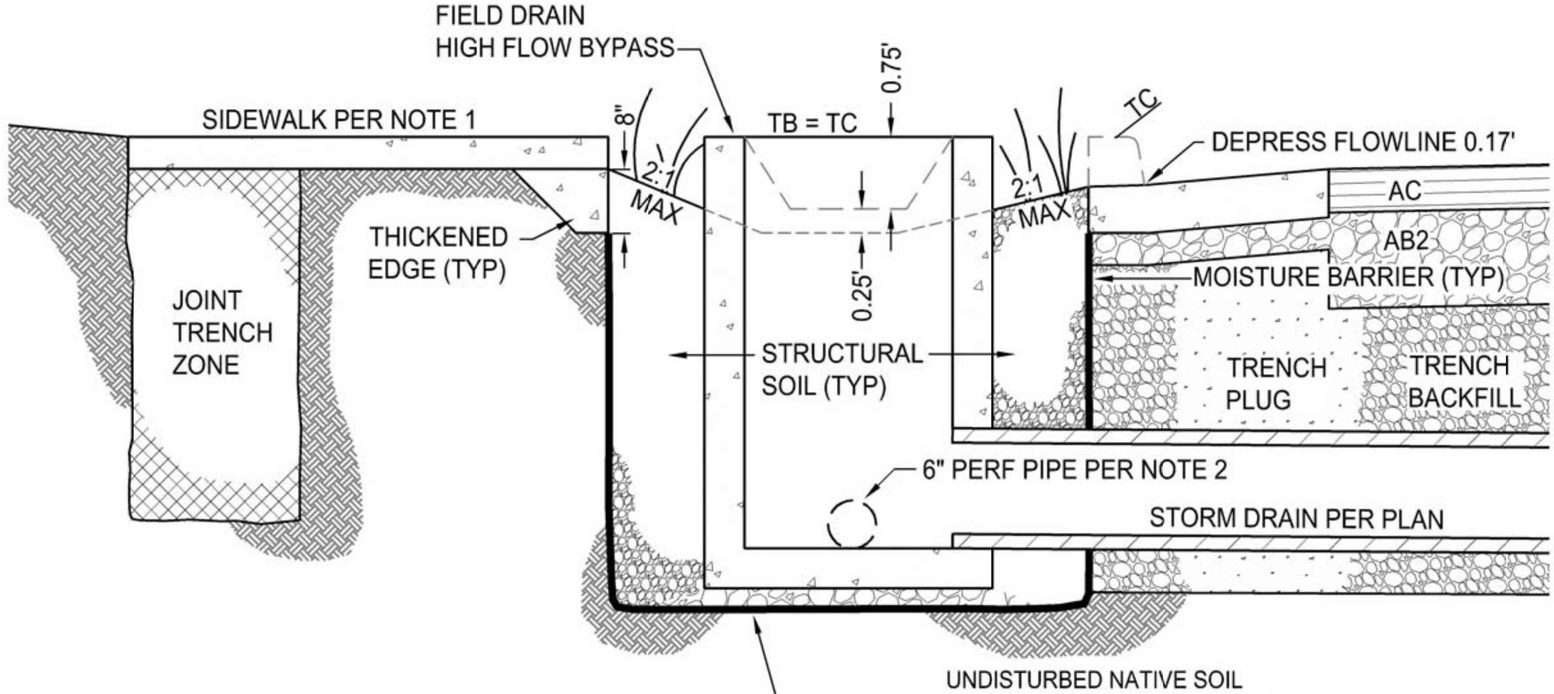


TYPE B -CURB OPENING ALONG A SLOPE

Not to Scale

SIMILAR TO P2-04 WITH A MOISTURE BARRIER LINER, NO INFILTRATION.

PRIORITY 3 ROADSIDE BIORETENTION - CURB OPENING	
SCALE: NONE	DATE: 04/06/17
DWN. DIT CHK. HM	SHEET 1 of 2 P3-04

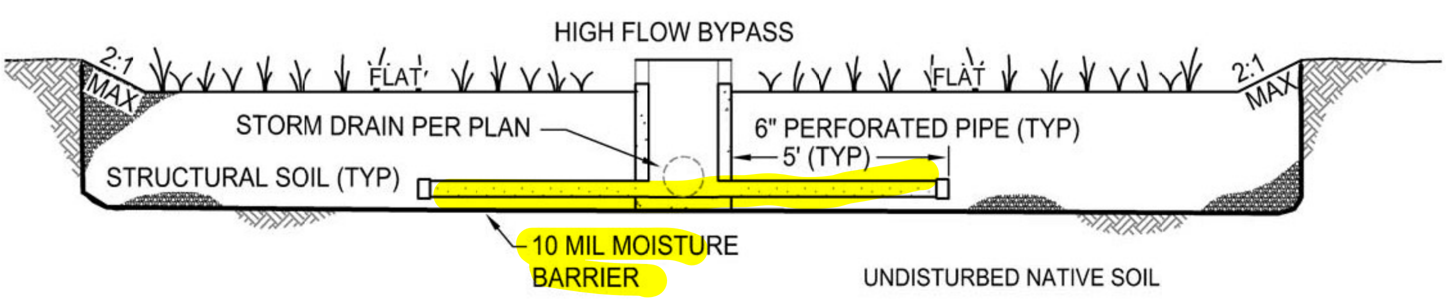


SECTION A-A

NOTES:

1. SIDEWALK, GUTTER AND PLANTER WIDTHS PER APPLICABLE GOVERNING AGENCY STANDARDS (TYP).
2. 6" PERFORATED PIPE TO BE SET IN BOTTOM OF TREATMENT AREA.

SIMILAR TO P2-04 WITH A MOISTURE BARRIER LINER, NO INFILTRATION.



SECTION B-B

Not to Scale

PRIORITY 3 ROADSIDE BIORETENTION - CURB OPENING SECTION A-A & B-B	
SCALE: NONE	DATE: 04/06/17
DWN. DIT CHK. HM — SHEET 2 of 2	P3–04

Appendix B: Approved Plant List

IMPORTANT NOTE: Only plants from this list should be added to vegetated LID features. If your project includes corrective actions involving planting, please choose species from this list. Any desired variances need approval from the Regional Water Quality Control Board. The City can conduct a site visit with you to discuss your specific site if you are unsure what to plant. If you do not have corrective actions involving plant installation, then this list is included for your reference for any future infill planting of the LID feature.

Vegetated LID features should have a minimum of 50% vegetative cover at maturity (usually about 3 years after installation). While trees are valuable in LID features and the broader landscape for many reasons, trees do not count towards the 50% vegetative cover. Only plants on the Grasses and Grass-like Plants, Herbaceous Plants, and Shrubs list below count towards total vegetative cover.

Botanical Name	Common Name	Low Zone (Riparian)	Mid Zone (Meadowland)	High Zone (Upland)	Vegetated Swales	Bioretention	Extended Detention Basin	Vegetated Buffer	Constructed Wetland	Tolerates Saturation	Drought Tolerant	WUCOLS (IV)	Likely WUCOLS if not rated	Other Notes
Grasses and Grass-like Plants														
Agrostis exarata	spike bentgrass		X	X	Yes		Yes	Yes				NR	M	
Alopecurus aequalis	short awn foxtail	X	X		Yes		Yes					NR	M	`
Alopecurus saccatus	Pacific foxtail	X	X		Yes		Yes					NR	M	
Bromus carinatus	California brome		X	X	Yes	Yes		Yes				NR	L	
Carex barbarae	Santa Barbara sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes	Yes	M		Not for full sun
Carex brevicaulis	short stem sedge		X	X	Yes	Yes	Yes	Yes			Yes	M		Short turf-like growth habit
Carex densa	dense sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex deweyanna	Dewey sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex divulsa	Berkeley sedge	X	X		Yes	Yes	Yes	Yes		Yes	Yes	M		Not a native. Mistakenly sold as the native C. tumulicola
Carex obnupta	slough sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex pansa	California meadow sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes	Yes	M		
Carex rupestris	curly sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex stipata	sawbeak sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex subfusca	rusty sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex testacea	New Zealand orange sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex tumulicola	foothill sedge	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	L		
Carex vesicaria	inflated sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Danthonia californica	California oatgrass		X	X	Yes		Yes		Yes			M		
Deschampsia danthonoides	annual hairgrass		X	X	Yes	Yes	Yes	Yes	Yes	Yes		NR	L	Can tolerate saturation if top soil layer drains
Deschampsia cespitosa	tufted hairgrass		X	X	Yes	Yes	Yes	Yes		Yes		L		Can tolerate saturation if top soil layer drains
Distichlis spicata	salt grass	X	X		Yes		Yes	Yes	Yes			L		
Eleocharis acicularis	needle spike rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		H		
Eleocharis macrostachya	creeping spike rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		H		
Eleocharis ovata	ovate spike rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		H		
Eleocharis palustris	creeping spike rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		H		
Elymus glaucus	blue wild rye		X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	L		
Elymus triticoides	creeping wild rye		X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	L		Synonym: *Leymus triticoides*
Festuca californica	California fescue			X	Yes	Yes	Yes	Yes			Yes	L		Can tolerate saturation if top soil layer drains
Festuca idahoensis	blue bunchgrass			X	Yes	Yes	Yes	Yes		Yes	Yes	VL		Can tolerate saturation if top soil layer drains
Festuca rubra	red fescue			X	Yes	Yes	Yes	Yes		Yes	Yes	L		Can be mowed as turf alternative. Can tolerate saturation if top soil layer drains
Glyceria occidentalis	western mannagrass	X	X		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	H	
Hordeum brachyantherum	meadow barley		X	X	Yes	Yes	Yes	Yes	Yes			NR	L	Can tolerate saturation if top soil layer drains
Juncus balticus	Baltic rush	X	X		Yes	Yes	Yes	Yes	Yes			NR	M	
Juncus bufonis	toad rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		NR	M	
Juncus effusus	Pacific rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		

Juncus ensofolius	dagger leaf rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		NR	M	
Juncus patens	blue rush	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	L		May not need summer irrigation after establishment
Juncus tenuis	slender rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	M	
Juncus xiphiodes	iris-leaved rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		NR	M	
Melica californica	California melic			X	Yes	Yes	Yes	Yes		Yes	Yes	NR	L	Low or very low water use in other regions
Melica imperfecta	small flowered melic			X	Yes	Yes	Yes	Yes		Yes	Yes	VL		Can tolerate saturation if top soil layer drains
Muhlenbergia rigens	deergrass			X	Yes	Yes	Yes	Yes			Yes	L		
Phalaris californica	California canary grass	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes		M		
Pleuropogon californicus	semaphore grass	X	X		Yes				Yes			NR	H	
Schoenoplectus americanus	three square	X					Yes		Yes	Yes		NR	H	
Schoenoplectus californicus	California bulrush	X					Yes		Yes	Yes		NR	H	
Stipa lepida	foothill needlegrass			X	Yes		Yes	Yes			Yes	VL		Synonym: *Nassella lepida*
Stipa pulchra	purple needlegrass			X	Yes		Yes	Yes			Yes	VL		Synonym: *Nassella pulchra*
Typha angustifolia	narrowleaf cattail	X					Yes		Yes	Yes		NR	H	
Typha latifolia	cattail	X					Yes		Yes	Yes		NR	H	

Botanical Name	Common Name	Low Zone (Riparian)	Mid Zone (Meadowland)	High Zone (Upland)	Vegetated Swales	Bioretention	Extended Detention Basin	Vegetated Buffer	Constructed Wetland	Tolerates Saturation	Drought Tolerant	WUCOLS	Likely WUCOLS if not rated	Other Notes
Herbaceous Plants														
Achilea millefolium	CA Native cultivars			X	Yes	Yes					Yes	L		
Achilea millefolium	non-native cultivars			X	Yes	Yes						M		
Aster sp.	aster		X	X	Yes	Yes		Yes				M		
Athyrium filix-femina	lady fern		X	X	Yes	Yes		Yes				M		For use in shade only
Blechnum spicant	deer fern		X	X	Yes	Yes	Yes	Yes			Yes	L		For use in shade only
Camassia leichtilinii	camas lily	X	X		Yes	Yes	Yes					NR	M	
Camassia quamash	common camas	X	X		Yes	Yes	Yes					M		
Epilobium canum	California fuschia			X	Yes	Yes		Yes*			Yes	L		
Eriogonum fasciculatum	flattop buckwheat			X	Yes	Yes					Yes	L		
Eschscholzia californica	California poppy			X	Yes	Yes					Yes	VL		
Fragaria chiloensis	beach strawberry			X	Yes	Yes		Yes		Yes	Yes	M		
Iris douglasiana	Douglas iris		X	X	Yes	Yes		Yes		Yes	Yes	L		
Lupinus bicolor	miniature lupine			X	Yes	Yes		Yes		Yes	Yes	NR	L	Tolerates saturation in winter only
Lupinus polyphyllus	large leaf lupine		X	X	Yes	Yes		Yes		Yes		H		similar to Russell hybrids
Mimulus guttatus	seep monkey flower	X	X		Yes		Yes		Yes	Yes		H		
Polypodium californicum	California polypody		X	X	Yes	Yes		Yes			Yes	VL		
Polypodium glycrrhiza	licorice fern		X	X	Yes	Yes		Yes			Yes	NR	L	
Polystichum californicum	California sword fern	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	M		
Polystichum munitum	western sword fern	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes		M		
Pteridium aquilinum	bracken fern		X	X	Yes	Yes	Yes	Yes				NR	M	
Sisyrinchium bellum	blue-eyed grass			X	Yes	Yes		Yes		Yes	Yes	VL		
Sisyrinchium californicum	yellow-eyed grass		X	X	Yes	Yes		Yes		Yes		M		
Veronica liwanensis	speedwell			X	Yes	Yes		Yes				M		

Appendix B: Approved Plant List

Botanical Name	Common Name	Low Zone (Riparian)	Mid Zone (Meadowland)	High Zone (Upland)	Vegetated Swales	Bioretention	Extended Detention Basin	Vegetated Buffer	Constructed Wetland	Tolerates Saturation	Drought Tolerant	WUCOLS	Likely WUCOLS if not rated	Other Notes
Shrubs														
Acmispon glaber	deerweed			X	Yes	Yes		Yes			Yes	VL		Formerly known as *Lotus scoparius*
Amelanchier alnifolia	western serviceberry											M		
Arctostaphylos manzanita	common manzanita			X		Yes		Yes			Yes	VL		Hybrids are considered low water-use
Arctostaphylos uva-ursi	manzanita 'Emerald Carpet'			X		Yes					Yes	L		
Baccharis pillularis	coyote brush		X	X	Yes	Yes		Yes			Yes	L		
Baccharis salicifolia	mulefat		X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	L		
Berberis aquifolium	Oregon grape		X	X	Yes	Yes		Yes				M		Variety repens is considered low water-use
Berberis pinnata	California barberry			X	Yes	Yes		Yes			Yes	L		Formerly known as *Mahonia pinnata*
Calycanthus occidentalis	Western spicebush		X	X	Yes	Yes		Yes		Yes	Yes	L		
Ceanothus sp	California lilac			X	Yes			Yes			Yes	L		Most species and cultivars ore considered low water-use
Cercis occidentalis	redbud			X	Yes			Yes			Yes	VL		
Cornus sp	dogwood		X	X	Yes	Yes	Yes	Yes		Yes	Yes	M		
Cornus sericea	dogwood		X	X	Yes	Yes	Yes	Yes		Yes		H		
Cornus stolonifera	redtwig dogwood		X		Yes	Yes	Yes	Yes		Yes		H		
Frangula californica	coffee berry			X	Yes			Yes			Yes	L		Also known as Rhamnus californica
Hebe 'Autumn Glory'	hebe		X	X	Yes	Yes		Yes				M		
Heteromeles arbutifolia	toyon		X	X	Yes	Yes		Yes		Yes	Yes	L		
Holodiscus discolor	ocean spray			X	Yes	Yes		Yes			Yes	L		
Lonicera involucrata	twinberry			X	Yes	Yes					Yes	L		similar to L. hispidula
Mimulus aurantiacus	sticky monkey flower		X	X	Yes	Yes	Yes	Yes		Yes		VL		
Mimulus cardinalis	scarlet monkey flower		X	X	Yes	Yes	Yes	Yes		Yes	Yes	L		
Morella californica	wax myrtle			X	Yes	Yes		Yes			Yes	M		Formerly known as *Myrica californica*
Oemleria cerasiformis	Indian plum		X	X	Yes	Yes		Yes				M		
Philadelphus lewisii	mock orange		X	X	Yes	Yes		Yes				M		
Philadelphus mexicanus	evergreen mock orange		X	X	Yes	Yes		Yes				L		
Physocarpus capitatus	Pacific ninebark		X	X	Yes	Yes		Yes			Yes	NR	L	
Ribes aureum	golden currant		X	X	Yes			Yes			Yes	L		
Ribes sanguineum	red flowering currant		X	X	Tes			Yes			Yes	L		
Rosa californica	California wild rose		X	X	Yes	Yes		Yes			Yes	L		
Rosa nutkana	Nootka rose		X	X	Yes	Yes		Yes			Yes	L		
Rosemarinus officinalis	rosemary			X	Yes			Yes*			Yes	L		
Rubus ursinus	California blackberry		X	X	Yes			Yes			Yes	L		
Salvia clevelandii	Cleveland sage			X	Yes			Yes*			Yes	L		
Sambucus cerulea	blue elderberry		X	X	Yes	Yes	Yes	Yes		Yes	Yes	L		
Sambucus mexicana	western elderberry		X	X	Yes	Yes	Yes	Yes		Yes	Yes	L		
Sambucus racemosa	red elderberry		X	X	Yes	Yes	Yes	Yes		Yes	Yes	L		
Spirea douglasii	Douglas spirea				Yes	Yes		Yes			Yes	M		
Symphoricarpos albus	snowberry		X	X	Yes	Yes	Yes	Yes		Yes	Yes	M		For use in shade only
Viburnum edule	highbush cranberry	X	X	X	Yes	Yes	Yes	Yes		Yes	Yes	NR	L	

Appendix B: Approved Plant List

Botanical Name	Common Name	Low Zone (Riparian)	Mid Zone (Meadowland)	High Zone (Upland)	Vegetated Swales	Bioretention	Extended Detention Basin	Vegetated Buffer	Constructed Wetland	Tolerates Saturation	Drought Tolerant	Street Tree	WUCOLS	Other Notes
Trees														
Acer buergerianum	Trident maple			X	Yes			Yes				Yes	M	2-3' planter
Acer campestre	Hedge maple			X	Yes			Yes				Yes	M	2-3' planter
Acer circinatum	vine maple	X	X	X	Yes	Yes		Yes		Yes		No	M	
Acer davidii	David's maple		X	X	Yes	Yes		Yes		Yes		Yes	M	2-3' planter
Acer fremanii	Freeman's maple			X	Yes	Yes		Yes			Yes	Yes	M	5-6' planter
Acer ginnala	Amur maple			X	Yes	Yes		Yes				Yes	M	2-3' planter
Acer macrophylum	Big leaf maple			X	Yes	Yes		Yes		Yes		No	M	
Acer pseudoplatanus	Sycamore maple			X	Yes	Yes		Yes				Yes	M	5-6' planter
Acer rubrum	Red maple			X	Yes	Yes		Yes				Yes	M	3-4' planter
Acer negundo 'Flamingo'	flamingo box eder			X	Yes	Yes		Yes				Yes	M	2-3' planter
Aesculus californica	California buckeye		X	X	Yes	Yes	Yes	Yes		Yes	Yes	Yes	VL	8' planter
Aesculus carnea	Red horsechestnut			X	Yes	Yes		Yes				Yes	M	4-5' planter
Alnus cordata	Italian alder		X	X	Yes	Yes		Yes				Yes	M	?
Carpinus betulus	various cultivars		X	X	Yes	Yes		Yes				Yes	M	3-4' planter
Cercis canadensis	eastern redbud		X	X	Yes	Yes		Yes				Yes	M	2-3' planter
Cercis canadensis 'texensis'	Texas redbud		X	X	Yes	Yes		Yes			Yes	Yes	M	2-3' planter
Cercis occidentalis	western redbud		X	X	Yes	Yes		Yes			Yes	Yes	VL	2-3' planter
Crataegus phaenopyrum	Washington thorn			X	Yes	Yes		Yes				Yes	M	possibly invasive
Fraxinus latifolia	Oregon ash	X	X		Yes	Yes	Yes	Yes	Yes	Yes		Yes	M	
Magnolia grandiflora	Little gem' or 'St. Mary'			X	Yes	Yes		Yes				Yes	M	3-4' planter
Magnolia grandiflora	Samuel Somner' or 'Russet'			X	Yes	Yes		Yes				Yes	M	6-8' planter
Metasequoia glyptostroboides	Dawn redwood		X	X	Yes	Yes		Yes				Yes	H	8' planter only
Populus fremontii	Fremont's cottonwood	X	X	X	Yes	Yes		Yes				Yes?	M	8' planter only
Pyrus calleryana	Flowering pear			X	Yes	Yes		Yes				Yes	M	need to specify varieties
Quercus agrifolia	Coast live oak		X	X	Yes	Yes		Yes				Yes	VL	8' planter only
Quercus garyana	Oregon white oak		X	X				Yes		Yes	Yes	No	L	
Quercus lobata	Valley oak		X	X	Yes	Yes		Yes		Yes	Yes	Yes	L	8' planter only
Quercus suber	Cork oak			X	Yes	Yes		Yes		Yes	Yes	Yes	L	6-8' planter
Salix laevigata	Red willow	X	X	X	Yes	Yes		Yes		Yes	Yes	No	H	
Salix lasiolepis	Arroyo willow	X	X	X	Yes	Yes		Yes		Yes	Yes	No	H	
Salix lucida ssp. Lasiandra	Shining willow	X	X	X	Yes	Yes		Yes		Yes	Yes	No	H	
Washingtonia robusta	Mexican fan palm		X	X	Yes	Yes		Yes			Yes	Yes	L	5-6' planter, possibly other species should be explored

APPENDIX E

WATER AND WASTEWATER STUDY

GRATON RESORT & CASINO EXPANSION PROJECT - WATER AND WASTEWATER STUDY

(PWSID: 090605174)

OCTOBER 2022

REGISTERED PROFESSIONAL ENGINEER
M. SEAN JEANE
No. 52402
Exp. 12-31-22
CIVIL
STATE OF CALIFORNIA

Prepared By:

Brelje & Race
CONSULTING ENGINEERS

Brelje & Race Consulting Engineers
475 Aviation Blvd. Suite 120, Santa Rosa, CA 95403
v. 707.576.1322 f. 707.576.0469
www.brce.com

Prepared For:

FEDERATED INDIANS OF
GRATON
RANCHERIA

Federated Indians of Graton Rancheria
640 Redwood Dr, Suite 300, Rohnert Park, CA 94928
v. 707.566.2288 f. 707.566.2291
www.gratonrancheria.com

Table of Contents

1. EXECUTIVE SUMMARY

The Graton Resort & Casino (Resort) in Rohnert Park, California, is owned and operated by the Federated Indians of Graton Rancheria (Tribe). The Resort is located on the Tribe's reservation which falls under the federal Indian trust responsibility. The Resort, originally constructed in 2013, sits on a 252-acre property and includes a 120,000 square foot (sf) casino gaming area plus 55,000 sf for back-of-house operations, a 45,000 sf banquet center, and a number of restaurants, a coffee shop, bars and a nightclub. In 2016, a 200-room hotel with meeting/conference rooms, a spa/pool area, and a parking structure were added. There are also several other large parking lots, landscaped areas, a central utility plant and other support facilities on the Resort campus.

An expansion of the casino and hotel, plus the addition of a new theater and parking structure are under consideration. The Tribe's plans for the Resort include a 221-room hotel expansion, a 144,000 sf casino floor and backroom expansion (including 86,078 sf of casino floor space and 57,613 sf of back of house, mezzanine and support space), a 3,500-seat theater addition, an 18,000 sf pool and spa area expansion, a new 9,700 sf rooftop restaurant, a second parking structure and other support facilities. Figure 2-2 shows the existing and proposed Resort site plan.

Currently, the Resort has its own water supply system including two supply wells, a water treatment plant, a 900,000 gallon potable water storage tank, and booster pumping to the distribution systems. The Resort was constructed with three separate water distribution systems; potable water only, recycled water (which also includes some irrigation uses) and irrigation only. Currently, all three distribution systems are served by water from the wells.

Wastewater from the Resort is currently discharged to the City of Rohnert Park's (Rohnert Park) sewer collection system. Rohnert Park's sewerage is pumped to the Subregional Laguna Wastewater Treatment Plant (LTP) for treatment and disposal.

A Tribal Environmental Impact Report (TEIR) is being prepared for the expansion pursuant to the Tribe's Tribal-State Compact. This study will be included as an appendix to the TEIR and has been prepared in accordance with Appendix B of the Tribal-State Compact.

This study evaluates and identifies the capacities of the existing water and wastewater facilities, identifies potential water and wastewater facility improvement alternatives to support the expansion project, analyzes potential new impacts to groundwater resulting from the Resort expansion and considers other potential impacts from alternatives considered for mitigating impacts to groundwater. While no specific recommendations are provided, the identified alternatives are thoroughly discussed and analyzed.

1.1 CURRENT WATER USE & WASTEWATER GENERATION

The Resort currently uses their supply wells for all onsite water uses. The groundwater basin is estimated to have more water being withdrawn than is being replenished. Continued increases in withdrawals would result in potentially harmful impacts to the groundwater basin, which serves many off-site uses.

Based on available data, current total annual water production from the existing wells is approximately 67.1 million gallons (MG) which equates to a daily average of 183,900 gallons per day (gpd). Since the Resort has separate plumbing for recycled and irrigation uses, there is a potential for offsetting current and future groundwater withdrawals by obtaining a reliable and consistent source of recycled water. The current potential for recycled and irrigation water use is approximately 45.2 MG (an annual average of 123,900 gpd), or 67 percent of all uses.

1.2 Water Use Projections

Future water demand for the proposed expansion was estimated using the current water demands for each facility type to be included in the expansion. Water demands for the expanded casino and hotel were assumed to be similar to existing demands based on square footage or number of rooms and projected proportionally. The projected water demands for the expansion were then added to the existing water demands to obtain the total projected water demand.

Table 1-1 Projected Water Demands

Description	Annual Average, gpd	Max Month, gpd
Existing Water Demand, 2017-2019	183,900	241,400
Projected Expansion Water Demands	153,900	177,500
Total Flows (Existing + Expansion)	**337,800**	**418,900**

The annual water demand projection for the expansion is approximately 56.2 MG (153,900 gpd), and the total combined water demand projection is 123.3 MG (337,800 gpd). Data for the current average day of the maximum demand month was also available and used to project demands for the maximum month after expansion. From Table 1-1, the maximum daily average during the highest demand month is expected to be approximately 418,900 gpd. Data for determining a maximum daily demand was not available, however, is estimated at roughly 450,000 gpd.

1.3 Projected Total Potential for Recycled Water Use

Projections for potential recycled water uses were prepared based on an estimated percentage of the total water demand for each element of the planned expansion that could be served by recycled water (refer to Table 4.2)

The annual total potential for recycled water use for the expansion is estimated at 32.9 MG (90,100 gpd). Combined with the existing potential for recycled water use, the total is approximately 78.1 MG annually (214,000 gpd). The potential for recycled water use amounts to roughly 60 percent of all water demands.

1.4 Projected Total Wastewater Generation

Projected wastewater generation for the expansion project was estimated as a percentage of the projected annual average water demand. The projected wastewater generation for the various expansion elements were added to the actual wastewater generated by the existing facilities to obtain the total projected wastewater generation figure (refer to Table 4.3).

The annual total wastewater generation from the expansion is estimated at approximately 45.5 MG. Combined with the existing wastewater generation, the total is approximately 93.8 MG annually, which is an average of 257,000 gpd. (Note: Annual wastewater generation is typically reported in MG.)

1.5 Water System Capacity

The capacities of the domestic supply wells, water treatment plant and domestic storage were evaluated. The results of the evaluations indicate that the overall capacity of each component is adequate to handle the demands generated by the expansion project.

1.6 Wastewater System Capacity

The capacity of the onsite wastewater collection and pumping systems were evaluated, as well as Rohnert Park's sewer capacity for receiving projected wastewater generated from the expansion project. Both have adequate capacity to handle projected flow rates.

The projected maximum daily wastewater flows for the full expansion is 205 gpm. And including a peaking factor, the highest momentary flows are anticipated at 279 gpm, which would use 80 percent of the onsite gravity sewer main capacity. The existing sewer lift station is also adequate with redundant pumps each capable of 425 gpm.

An existing JPA between Rohnert Park and the Tribe allows the disposal of up to 410,000 gpd through the City's sewer collection system. The projected maximum daily flow for the expansion project is 295,200 gpd, well within the terms of the existing JPA.

1.7 Groundwater Analysis

An analysis of the area geology and hydrogeology and the potential impacts to the local groundwater basin was performed. The analysis assumed continued use of the existing wells for supply of all onsite water demands for the expanded project

The Resort's wells are located within the Santa Rosa Plain Sub-Basin, which lies within the greater Santa Rosa Valley. A computerized numerical groundwater flow model, the Santa Rosa Plain Hydrologic Model (SRPHM), developed by the USGS in 2014 and recently revised by Sonoma Water to incorporate more recent data, was used as a groundwater management tool to calculate the combined groundwater flows into and out of the basin to both the shallow and deep aquifer.

The annual average projected pumping for the 50-year period from 2021 to 2070 of 26,100 AF exceeds the sustainable yield indicating that management actions are needed to sustainably manage the subbasin and avoid potential future undesirable results.

A previous groundwater study prepared as part of the original Environmental Impact Statement (EIS) for the initial project, assessed how the two production wells for the project would affect local groundwater levels. The maximum sustainable water demand for the project was estimated as 200 gpm or 288,000 gpd.

1.8 Groundwater Supply Feasibility Evaluation

For the current proposed expansion project, the original EIS and associated Record of Decision provided guidance and mitigation measures based on a sustained 200 gpm pumping rate. Therefore, the current analyses focused on ways to maintain the sustained pumping rates at 200 gpm or less. Without offsetting water demands projected from the planned expansion, such as by obtaining a recycled water source, the water demand for the proposed expansion is projected to increase the sustained rate of withdrawal to 235 gpm (337,800 gpd).

Due to the anticipated increase in demand to greater than 200 gpm, the following mitigation measures may be considered to address potential groundwater impacts:

- Reduce water demand through installation of Energy Star rated low-flow fixtures for bathroom faucets in the expansion area.
- Initiate recycled water use at the Resort to partially or fully offset the increased groundwater use due to the proposed expansion.
- Provide recharge of the groundwater basin through use of leach fields or other underground injection methods. (Additional geotechnical studies would be required to estimate feasibility of recharge systems given the anticipated low permeability of on-site soils.)
- Continue implementation of the Groundwater Monitoring Program.

1.9 Recycled Water Source Alternatives

The most effective mitigation to reduce demands on the groundwater basin would be to implement the use of recycled water at the Resort (existing and future). There is an existing dedicated recycled water system and an irrigation system that could both use recycled water if it were available.

Several alternatives for full or partial use of recycled water are analyzed. They include:

- Purchase recycled water from Rohnert Park through the LTP recycled water system. There are three sub-alternatives for this option:
  - A full-year connection for all recycled water system demands, including irrigation.
  - An off-season-only connection for all non-irrigation recycled water system demands.
  - A full-year connection for recycled water demands associated with the expansion project only.
- Construct an onsite wastewater treatment plant (WWTP) to treat wastewater generated on the Resort campus to tertiary levels, suitable for reuse. There are three sub-alternatives for this option:
  - Offset demands from the expansion project by sizing the WWTP to treat minimum monthly wastewater flows; excess wastewater would be conveyed to the LTP for treatment.
  - Size the WWTP for maximum recycled water demands; excess wastewater would be conveyed LTP for treatment.
  - Size the WWTP for maximum wastewater flows; excess treated effluent potentially available for groundwater recharge.

The volume and timing for purchasing recycled water would need to be negotiated with Rohnert Park. Each of the alternatives would reduce overall sustained pumping from the supply wells to below 200 gpm.

1.10 Conclusions

A summary of the key findings is provided below:

- The Groundwater Sustainability Plan (GSP) indicates there is a projected average groundwater loss through 2070 of 1,400 acre-foot per year (AFY) in the Santa Rosa Plain Sub-Basin.
- The projected cumulative water demand of 235 gpm is within the existing production well yield capacities for both Casino Wells. Each well could independently produce enough water to meet the projected water demand.

- A cumulative sustained flow rate of 235 gpm would exceed the 200 gpm sustained flow rate evaluated in the initial EIS without the use of recycled water.
- Greater pumping rates to meet the projected 46 percent water demand increase due to the proposed expansion may contribute to impacts to groundwater levels. An increased radius of influence would be expected and potentially have a negative effect on nearby wells in the immediate vicinity of the Resort.
- The reuse of recycled water, either through purchasing of external sources, or through on-site wastewater treatment, would reduce impacts to the groundwater basin to below the initially targeted well demand (200 gpm) established as part of the original EIS and potentially below current well demands.

Recycled water reuse should be implemented to reduce overall impacts from groundwater withdrawals. A connection to the City's recycled water distribution network would be the least costly alternative.

2. INTRODUCTION

2.1 BACKGROUND

The Graton Resort & Casino (Resort) is located at 288 W Golf Course Drive in Rohnert Park, California, and is owned and operated by the Federated Indians of Graton Rancheria (Tribe). The property comprises an area of approximately 252 acres with the Resort occupying the northeast portion of the property. The southwest portion of the property is used primarily for agriculture with some ancillary areas for the Resort. (Refer to Figure 2-1.)

The Resort is surrounded to the southeast by mixed residential, commercial, and industrial property and residential and agricultural land to the south, west, north, and northeast. The Laguna de Santa Rosa runs along the southwest border of the property and the Bellevue-Wilfred Flood Control Channel (a man-made water channel) runs through the southwest. The majority of the southwest portion of the property is within a 100-year floodplain, while the northeast portion is outside the 100-year flood plain.

The Resort was constructed in 2013, consisting of the current casino gaming area and restaurants. The adjoining hotel, pool and parking structure were added beginning in 2016. A new expansion of the Casino and hotel, plus the addition of a new theater and parking structure are under consideration. The purpose of this report is to identify water resource needs associated with the planned expansion, compare those needs to the originally proposed groundwater withdrawal rate of 200 gpm (288,000 gpd) and to identify potential means to mitigate impacts beyond that withdrawal rate.

The Resort currently uses its own water supply system which includes two supply wells, a water treatment plant, large storage tank, and booster pumping to supply pressure to the distribution systems. The Resort was constructed with three separate water distribution piping systems; potable water only, recycled water (which also includes some irrigation uses) and irrigation only. Currently, all distribution systems are served by potable water from the wells. The Resort currently discharges all wastewater through an onsite duplex sewer lift station and force main into the City of Rohnert Park's (Rohnert Park's) sanitary sewage system. Wastewater treatment is provided at the Subregional System's Laguna Wastewater Treatment Plant (LTP).

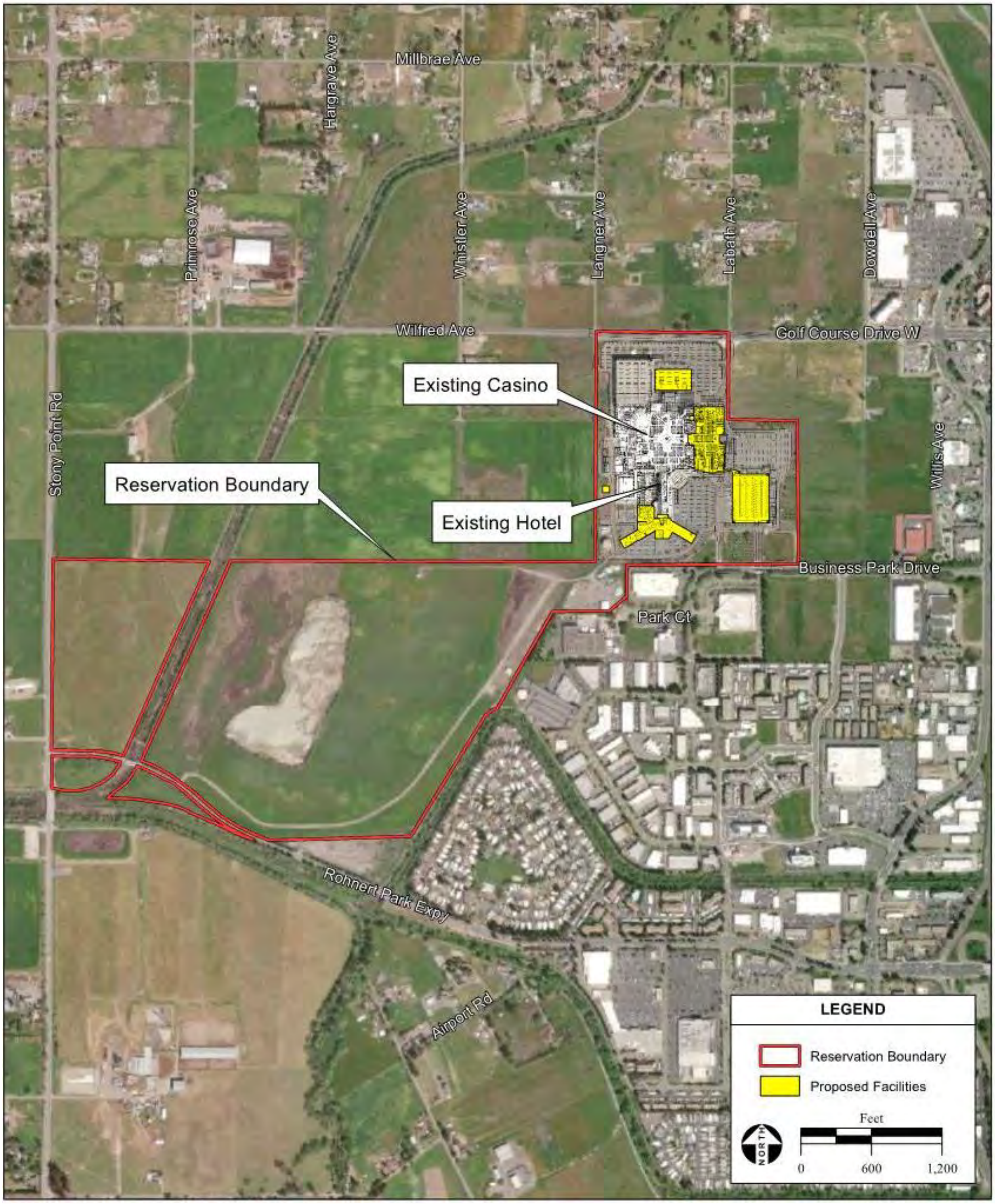


Figure 2-1 Site and Vicinity

2.2 PROJECT DESCRIPTION

The Resort currently includes a 200-room hotel, a 27,000 square foot (sf) pool and spa, a 175,000 sf casino floor (including the 55,000 sf back of house facilities), a 45,000 sf banquet center (with meeting space, pre-function, kitchen, office, and support facilities), 83,400 sf of food and beverage service (including a buffet, three bars, four service bars, leased restaurants, a coffee shop, a steakhouse and food court with six tenants), and 15,000 sf of nightclub/lounge space. The Tribe plans a future expansion of the Resort to include a 221-room hotel expansion, a 144,000 sf casino floor expansion (including 86,078 sf of casino floor space and 57,613 sf of back of house, mezzanine and support space), a 3,500-seat theater, an 18,000 sf pool expansion, a 9,700 sf rooftop restaurant, expanded parking and back of house facilities needed to support the new facilities. The proposed expansion is shown in Figure 2-2.

The purpose of this study is to evaluate the capacities of the existing water and wastewater facilities, identify any required water and wastewater facility improvements, and analyze the potential new or additional impacts to groundwater, as related to the Resort expansion. Additionally, potential issues associated with identified improvements will be described and potential measures to reduce groundwater withdrawals will be proposed. This study will:

- Review actual water demands and wastewater production for the operation of the Resort since completion of the Resort's last major expansion in the fall of 2016.
- Prepare water demand and wastewater generation estimates associated with the proposed expansion.
- Evaluate the capacity of the existing water supply, treatment and delivery facilities and wastewater collection and disposal facilities regarding their ability to meet expected capacity
- Prepare and analyze alternative sources of recycled water to offset potable water demands.
- Evaluate the effects of the proposed expansion, including with and without recycled water offset, on the groundwater basin.

Figure 2-2 Expansion Site Plan

3. EXISTING FACILITIES

3.1 WATER FACILITIES

All water demand at the Resort is currently served by the onsite water system. Groundwater is extracted from onsite wells, treated by the onsite treatment system, stored and then distributed through the Resort's distribution systems. The water distribution systems serve all potable water, recycled/irrigation water and fire system uses on the campus. The recycled water and irrigation distribution systems were designed to use a separate recycled water source but are currently served with raw or treated potable water from the onsite wells. The recycled water system is described fully in Section 3.2. A schematic of the water supply, treatment and distribution systems is shown on Figure 3-1. Each of the components of the existing water facilities is described more fully below.

The Resort is located within the Santa Rosa Plain Sub-Basin which is generally within the Santa Rosa Plain watershed (SRP watershed). The Sub-basin is one of six groundwater basins or portions of groundwater basins contained within the SRP watershed. Groundwater level within the sub-basin, as discussed in greater detail later herein, is declining due to numerous existing agricultural and municipal withdrawals from the basin, and further withdrawals may result in off-site impacts.

3.1.1 Water Supply Wells

The Resort has two onsite wells, Well #1 and Well #2. Well #1 has a depth of 650 ft with an estimated yield of 500 gpm. Well #2 has a depth of 680 ft with an estimated yield of 400 gpm. Well #1 is primarily used for irrigation water supply (see Section 3.2.2) and as a backup potable supply source and Well #2 is primarily used for potable water supply.

3.1.2 Water Treatment Plant

The treatment plant consists of filtration units for the removal of iron and manganese and includes a sodium hypochlorite disinfection system. Treatment in accomplished by injecting sodium hypochlorite solution directly into the raw well water ahead of filtration. The chlorinated water enters a prefilter tank used for equalization prior to filtration. Downstream of the prefilter tank sodium hydroxide for pH control and ferric chloride for aiding arsenic removal are injected just upstream of the filters. There are three automated treatment filters that operate in parallel, with space available to add a fourth filtration unit. Total current production capacity through the filtration system is 300 gpm. The filters are currently operating at less than full capacity. Bisulfite is added post-filtration as a de-chlorination step ahead of storage.

3.1.3 Water Storage Tank

The system includes a 900,000 gallon welded steel water storage tank. The capacity is sufficient for potable operational equalization purposes and includes fire and emergency storage reserves.

3.1.4 Water Distribution System (Potable Water)

A booster pump station is located within the water treatment plant building and draws from the water storage tank to pressurize the water distribution system. Three booster pumps pressurize the water distribution piping with each pump capable of pumping 170 gpm at operating pressure. The booster pumps are controlled using variable speed drives set to maintain uniform system pressure.

3.1.5 Fire System

The separate fire system is supplied using a dedicated fire pump with jockey pump for maintaining constant system pressure. The potable water supply tank also serves as the fire storage tank and is capable of delivering 2,000 gpm for a minimum four-hour duration. The fire system includes onsite fire hydrants around the campus, and the in-building sprinkler systems. Fire system water use is unmetered.

3.2 RECYCLED WATER FACILITIES

The Resort was originally designed and equipped with two separate water distribution systems, a potable water system and a recycled water system. There is currently no available source for the recycled water system and is instead being fed using potable water from the wells. The recycled water distribution system was originally intended to offset potable uses and serve several functions on campus where its acceptable to use reclaimed wastewater treated to a tertiary level, such as toilet flushing, wash-down water, cooling tower resupply, and landscape irrigation. Both systems are shown on Figure 3-1 as currently operated.

3.2.1 Recycled Water Distribution System

The recycled water distribution system (also called Reclaimed water) includes a 2,500 gallon feed/equalization tank with an air gap serving the recycled water booster pump station consisting of three pumps. The recycled water booster pump station pressurizes the plumbing connected to toilets, cooling towers, some irrigation uses and other common uses that allow use of sufficiently treated reclaimed wastewater. Although there is a recycled water system serving other nearby properties, that system is at capacity. As there currently is no existing source of recycled water available, the recycled water distribution system is forced to use treated potable water instead.

3.2.2 Irrigation Distribution System

The irrigation distribution system includes a separate 2,500 gallon equalization tank with an air gap serving a booster pump station for landscape irrigation only. The irrigation booster includes three pumps. The irrigation boosters pressurize separate irrigation system plumbing which supplies the majority of irrigation on the campus. Some irrigation is also served from the recycled water piping system. The irrigation distribution system is currently using untreated water supplied primarily by Well #1. Untreated water from either well can be supplied to the irrigation boosters as necessary.

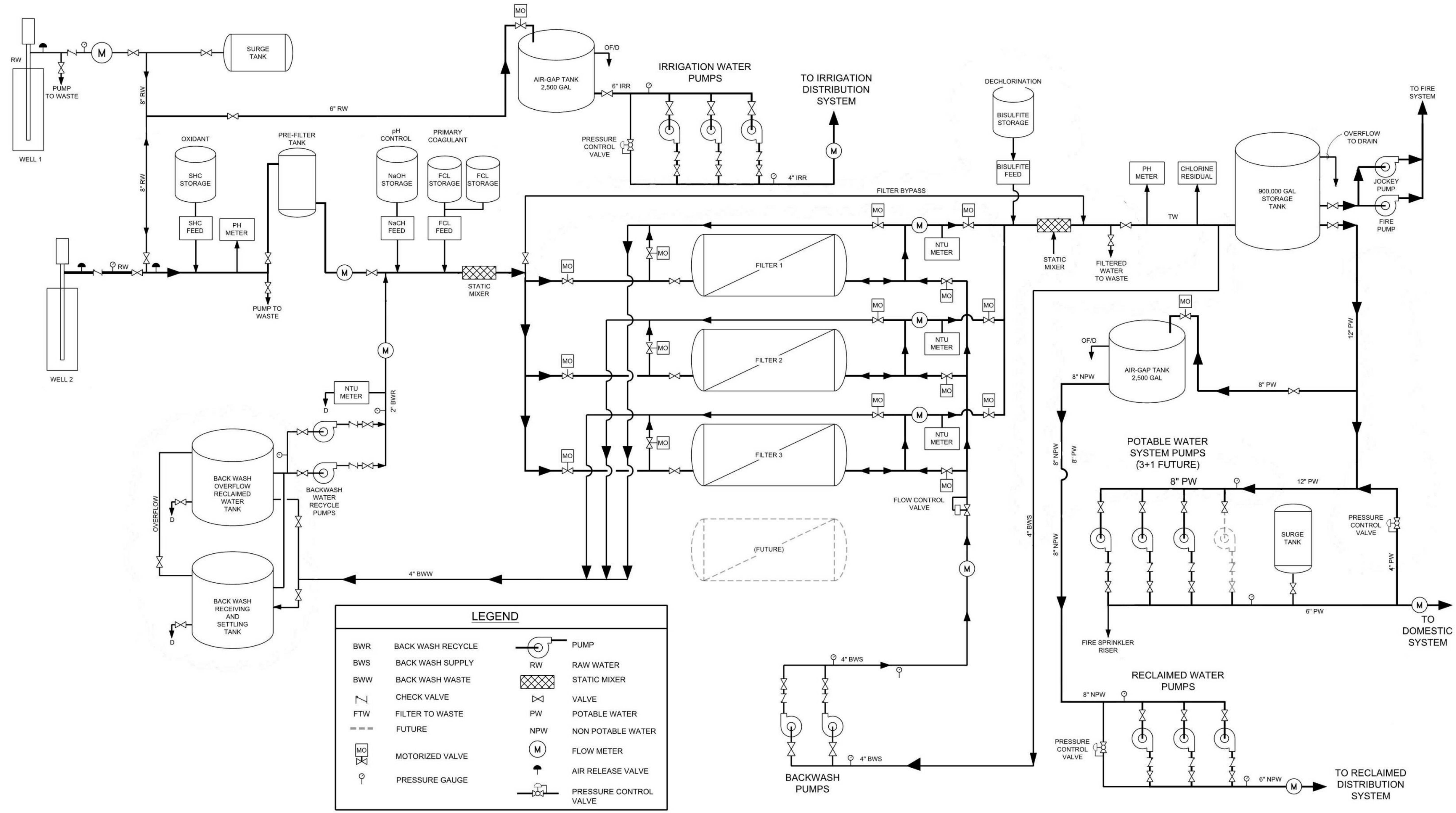


Figure 3-1 Water System and Distribution Systems Schematic

3.3 WASTEWATER FACILITIES

Wastewater from the Resort is collected and conveyed through an 8-inch gravity sewer main to an onsite duplex sewer lift station. Based on hydraulic calculations, the overall capacity of the sewer main is estimated at 347 gpm. The sewer lift station is located to the south of the casino and hotel and consists of two redundant grinder pumps, each with a 425 gpm capacity. Only one pump runs per start and the pumps alternate starts. The lift station pumps raw sewage through a force main to a nearby manhole within the Rohnert Park sanitary sewage collection system. The force main has a reported capacity exceeding 694 gpm, which is sufficient to handle the full pumping capacity. The Resort's wastewater combines with Rohnert Park flows heading to the central pumping plant and are then pumped to the LTP for treatment and disposal/reuse. The LTP is operated by the City of Santa Rosa.

The Resort's wastewater disposal is regulated by an existing Joint Exercise of Powers Agreement between Rohnert Park and the Tribe. By this agreement, Rohnert Park provides wastewater treatment and disposal services to the Resort up to 410,000 gpd, much greater than is currently being generated on any given day (Refer to Table 3-1).

3.4 HISTORIC WATER PRODUCTION AND WASTEWATER GENERATION

Historical production and flow data for the wells, each distribution pump station, and the sewer lift station were provided for the Resort's water and wastewater systems. The three-year period from January 2017 through the end of December 2019 was determined to best represent normal annual and seasonal flows of the existing Resort facilities. The Resort's most recent expansion was not completed until the fall of 2016 and from March 2020 through December 2021, the Resort experienced abnormal annual demand patterns assumed to be due to the COVID-19 pandemic. The three-year flows are summarized in Table 3-1.

Table 3-1 2017-2019 Water and Wastewater Production

Description	Annual Average			Max Month	
	gal	gpd	gpm	gpd	gpm
Well Production	67,106,200	183,900	130	241,400	170
Potable Water Pump Station	17,501,000	48,000	35	49,000	35
Recycled Water Pump Station	34,813,700	95,400	65	116,400	80
Irrigation Water Pump Station	10,401,900	28,500	20	64,800	45
Unmetered Use[1] (6.5 percent)	4,389,600	12,000	10	11,300	10
Wastewater Pumping	48,305,200	132,300	90	147,300	100

1 Estimate of unmetered uses (such as from the fire system/hydrants) or losses in the system.

4. WATER, RECYCLED WATER, AND WASTEWATER PROJECTIONS

The planned expansions, including to the gaming floor, restaurants, hotel, events center, and other changes are anticipated to result in increased water demands and wastewater generation. Water demand, recycled water demand, and wastewater generation projections have been estimated using a similar methodology to previous expansion studies. The projections were made for each individual component of expansion and then added to the current water use and wastewater generation figures. The expanded parking area is predicted to have a negligible water demand/wastewater generation and a negligible net change in irrigated area was assumed.

4.1 PROJECTED WATER DEMAND

Projected water demand for the proposed expansion was determined using the size and quantity of each specific unit type to be included in the expansion (e.g. number of new hotel rooms, gaming area square footage in the addition, etc.) and an annual average water demand per unit of expansion. The projected water demands for the expansion were then added to the existing water demands to obtain the total projected water demand. The results are presented in Table 4-1.

Table 4-1 Potable Water Demand Projection[3]

Description	Number	Unit	GPD/unit	Annual Average, gpd	Max Month, gpd
Hotel Wing Expansion	221	Rooms	175	38,700	44,500
Casino Floor	144	1,000 sf	440	63,400	72,900
Theater	3,000	Seats	12[1]	36,000	41,400
Pool	18	1000 sf	-[2]	2,800	3,700
Rooftop Restaurant	200	Seats	65	13,000	15,000
Projected Expansion Potable Water Demands				**153,900**	**177,500**
2017-2019 Existing Facilities Water Demands				**183,900**	241,400
Total (Existing + Expansion) Projected Demands				**337,800**	**418,900**

1 Assumed 35 gpd per seat for events, with two to three events each week.
2 Pool calculated assuming adult pool is similarly sized to the existing pool. Additional bar and concession area will add roughly ½ the area of the existing pool facility.
3. Irrigation demands are included in the 2017-2019 Demands figures since potable water was used for irrigation, however, the expansion project is not anticipated to include significant new landscaping and may potentially reduce irrigation requirements slightly. Irrigation demands for the expansion are therefore considered negligible.

The annual average water demands per unit of expansion were taken from previous planning studies[1]. Prior to the completion of the existing Resort facilities in the fall of 2016, average water

[1] Applied Engineering and Geology, Inc.; Evaluation of Water Supply and Wastewater Management Feasibility and Evaluation of Groundwater Supply Feasibility and Potential Off-Reservation Impacts to Water Quality and Resources; Graton Rancheria Hotel and Casino Expansion Project; November 16, 2016; Revised November 30, 2017.

Hydroscience Engineers Inc.; Graton Rancheria Hotel and Casino Project Water and Wastewater Feasibility Study; November 2007.

demands were projected to be 191,300 gpd. Based on the 2017-2019 water demand data, the original projections were found to be accurate and slightly conservative with actual water demand for the three-year period being 183,900 gpd.

The maximum month water demand corresponds to the average daily water demand during the highest water use month. For the Resort, this corresponds to the month of July, when both potable water and irrigation demand is high. The maximum month water demand projections for each component of the expansion were estimated based on the peaking factor of the existing sewer flows. This should be reasonably accurate since no new irrigation demand is anticipated. Data for determining a maximum daily demand was not available, however, it will be slightly higher than the projected average for the maximum month, which in this case should be roughly 450,000 gpd.

4.2 Projections for Reclaimed/Recycled Water Use

Projections for potential uses of recycled water were prepared based on an estimated percentage of the total water demand for each element of the planned expansion that could be served by recycled water. These projections were then added to the potential recycled water demands for the existing facilities, specifically to the irrigation and recycled water pump station metered flows. On average, roughly 67 percent of the Resort's current water demand could be satisfied using recycled water leaving only 33 percent of current demands from their potable water sources. The projections are presented in Table 4-2.

Table 4-2 Estimated Recycled Water Use Potential

Description	Estimated Percent Recycled Water	Water Demand, gpd		Recycled Water Potential, gpd	
		Annual Average	Max Month	Annual Average	Max Month
Hotel Wing Expansion	10	38,700	44,500	3,870	4,450
Casino Floor	75	63,400	72,900	47,550	54,675
Theater	95	36,000	41,400	34,200	39,330
Pool	20	2,800	3,700	560	740
Rooftop Restaurant	30	13,000	15,000	3,900	4,500
Projected Expansion Recycled Water Use Potential[1]				**90,100**	**103,700**
2017-2019 Existing Facilities Irrigation and Recycled Water Pump Station Flow Totals				**123,900**	**181,100**
Total Recycled Water Use Potential (Existing + Expansion)				**214,000**	**284,800**

1 Values rounded to the nearest 100 gpd.

For each element of the expansion a different estimated percentage of recycled water was assumed. The reasoning applied for determining the percentage factors for recycled water use is presented herein following:

- Hotel: There are few potential uses for recycled water. The majority of water use in the hotel will be in guest rooms or housekeeping services. Only toilet flushing in public restrooms could use recycled water. Potential for recycled water use is estimated to be 10 percent.
- Casino Floor: The largest estimated use of recycled water on the casino floor would be for toilet flushing in the restrooms. Other uses within the casino area require potable water. Potential for recycled water use is estimated at 75 percent, just slightly higher than the estimated for the current facilities.
- Theater: The greatest potential for recycled water use in the theater is anticipated to be for toilet flushing in the restrooms. Potential recycled water use is estimated to be 95 percent, although this may depend on what other facilities will be available in the theater (e.g. kitchen, bar, lounge, etc.). The current assumption is there will be no other significant water-using facilities.
- Pool: In the pool expansion very little potential for recycled water is expected. Most uses, such as the pool itself, showers, and any concession stands or bars, will need to be served by potable water. Only toilet flushing in the restroom facilities have the potential to use recycled water. Potential for recycled water use is estimated to be 20%.
- Rooftop Restaurant: At the restaurant, recycled water can be used at the restroom toilets. All other uses, such as in the kitchen, require potable water supply. Potential recycled water use is estimated to be 30 percent.

Total projected monthly recycled water demands (existing plus expansion) were estimated by adding together the existing monthly recycled water demand (metered flows from the recycled water pump station and irrigation pump station) and the projected monthly recycled water demand for the planned expansion elements. The maximum month projected recycled water demand for the expansion was estimated using the maximum month sewage multiplier for the existing Resort. The sewage multiplier was considered to be the most appropriate for estimating the recycled water demand for the Resort expansion.

4.3 PROJECTED WASTEWATER GENERATION

Projected wastewater generation for the proposed expansion was calculated as a percentage of the projected annual average water demand. The projected wastewater generation for the various expansion elements were added to the actual wastewater generated by the existing facilities to obtain the total projected wastewater generation figure. The results are presented in Table 4-3.

Table 4-3 Wastewater Generation Projections

Description	Projected Water Demand, gpd	Wastewater Generation From Water Demand, percent	Annual Average Wastewater Generation, gpd
Hotel Wing Expansion	38,700	75.4	29,200
Casino Floor	63,400	83.3	52,900
Theater	36,000	83.3	30,000
Pool	2,800	83.3[1]	1,600
Rooftop Restaurant	13,000	83.3	10,900
Projected Expansion Wastewater Total			**124,600**
2017-2019 Existing Facilities Wastewater Generation			**132,400**
Total Projected Wastewater Generation (Existing + Expansion)			**257,000**

1 For the pool expansion, only water demand from facilities such as concession stands, restrooms, etc. are included in the projection.

Prior to the completion of the existing Resort facilities in the fall of 2016, the wastewater projections were estimated to be 147,000 gpd by using a percentage of the estimated potable water demands. Based on the actual 2017-2019 water demand data, the original projections were slightly conservative, but otherwise very accurate; actual water demand was 132,400 gpd, or approximately 11% less than estimated. The annual average wastewater generation percentages of potable water demand from the previous planning studies were therefore reused for the current projections due to their accuracy.

Total monthly wastewater generation (existing plus expansion) was estimated by adding the existing monthly wastewater generation figures to the projected monthly wastewater generation figures for the expansion.

5. EXISTING FACILITY CAPACITY ANALYSIS

5.1 POTABLE WATER FACILITIES CAPACITY ANALYSIS

The capacities of the domestic supply wells, water treatment plant and domestic storage were evaluated. The results of the evaluations are described below. The pumping and delivery systems for recycled water and the irrigation system were not evaluated.

5.1.1 Water Supply Wells

Historically, the water supply wells have supplied water for all uses at the resort, including potable and non-potable uses. For the planned Resort, the total demand on the water supply wells will depend on whether recycled water is available for non-potable uses. For the purpose of this evaluation, it was assumed that all water demands will be served by the wells. This conservative analysis might also reflect a situation in which recycled water was temporarily unavailable.

Well #1 has a reported yield of 500 gpm and Well #2 has a reported yield of 400 gpm. The total projected water demand for the Resort during the maximum month requires pumping at an average rate of 290 gpm. California Title 22 for new public water systems requires that there be two sources of supply, each capable of independently providing the maximum day demand. The actual maximum day demand is not known, however, based on other similar water systems it is estimated to be 10 to 20 percent above the average of the maximum monthly demand, or roughly 350 gpm. Since both wells have higher production rates than the estimated maximum day demand, Title 22 is satisfied. (The tribe may not be subject to Title 22, however, the code is a conservative benchmark and is nonetheless satisfied.) Should a source of recycled water be obtained for non-potable uses, then the overall demands on the potable supply wells will be much less than their individual capacities.

5.1.2 Water Treatment System

The treatment capacity of the Resort's existing filtration plant is approximately 300 gpm. The projected average daily demand during the maximum demand month is 290 gpm which is just under the existing treatment capacity. A peak day during the maximum month has been estimated at 350 gpm, however, several days of demands above production capacity would not be an issue given the buffering capacity of the existing onsite storage. The storage tank has over 300,000 gallons of excess capacity, a portion of which is intended to handle daily operational fluctuations. Also, approximately 45 gpm of the maximum monthly demand figure is from irrigation requirements. Most of the irrigation demand is satisfied using raw well water and is not treated. Therefore, the existing water treatment filters are appropriately sized for all projected future demands, including treated water currently diverted to the recycled water system.

Ancillary equipment, such as the chemical feed pumps and day tanks for the chemicals used in treatment process (sodium hypochlorite, sodium hydroxide, ferric chloride, and bisulfite) were not analyzed. These systems may need to be proportionally upsized, depending on the future availability of a recycled water source.

5.1.3 Water Storage Tank

The existing potable water storage tank has a nominal capacity of 900,000 gallons and appears sufficient to accommodate the proposed expansion. Three components are typically evaluated when reviewing water storage tank capacity, as described below:

- ***Active Volume/Equalization:*** The active volume available for use in day-to-day operations to buffer short-duration peaking demands. Typically, up to 10 percent of a maximum day demand.
- ***Fire Reserve:*** Intended to remain available for fire fighting at all times and to only be used during a fire emergency. The existing water storage tank has a fire reserve capacity of 560,500 gallons. The reserve is ensured by means of a standpipe rising 16.1 feet from the bottom of the tank for domestic water uses other than the fire reserve. The fire system draws from the lower portion of the tank volume.
- ***Emergency Storage:*** Water available for an emergency, separate from the fire reserve, intended to provide adequate supply during a water supply outage. Emergency storage is recommended to approximately equal to an annual average daily water demand less irrigation

(est. 20,000 gallons – served from the recycled system) and other non-essential uses that could be curtailed in an emergency.

The fire reserve noted above is greater than mandated. In the 2016 Expansion Memo for the cancelled Resort expansion project (which included a 200-room hotel expansion), the fire flow requirement was estimated as 2,000 gpm for a duration of 4 hours or 480,000 gallons. The fire flow requirement is anticipated to remain the same for the current expansion project. The recommended volume for emergency storage will increase with the planned expansion, and even though the recommended volume is not quite met, there is still adequate reserve and no additional storage would be recommended. The water storage tank capacity analysis is broken down in Table 5-1.

Table 5-1 Water Storage Tank Capacity Analysis, gallons

Subcomponents	Existing Facilities	Planned Expansion
Fire Reserve[1]	560,500	560,500
Emergency Storage[2]	163,000	318,000
Active Volume/Equalization	25,000	40,000
Total Recommended Capacity	**748,500**	**918,500**
Total Actual Capacity	**900,000**	**900,000**

1 Domestic reserve is physically separated from fire reserve by a standpipe with inlet set at 16.1 ft. above the tank floor.
2 Recommended to be equal to or greater than the average daily flow less irrigation demand.

5.2 WASTEWATER FACILITIES CAPACITY ANALYSIS

An existing wastewater disposal agreement (JPA) in place with Rohnert Park allows the Tribe to dispose of up to 410,000 gpd of wastewater generated by the Resort through the City's collection system and pumping plant to the LTP. The projected average daily flow of 256,000 gpd and maximum daily flow of 295,200 gpd, will use 63% and 72% of the current agreement capacity, respectively.

Section 3.3 noted the current flow capacities of the various infrastructure in the Existing Wastewater System. The estimated capacity of the existing 8-inch gravity sewer main from the Resort to the Resort's sewer lift station is 347 gpm without surcharging. The projected average wastewater production is 178 gpm and the projected maximum wastewater production is 205 gpm (based on average day of maximum demand month). These flows amount to 51 percent and 59 percent of the gravity main capacity, respectively. Considering an instantaneous peaking factor of 1.36, which is based on peak flows in years 2017-2019, a peak flow of 279 gpm is anticipated, or 80% of the gravity main capacity. The duplex sewer lift station has a reported capacity of 425 gpm from each pump running independently, which is considerably greater than the projected peak flow rate. The projected average and peak wastewater flows are therefore within the existing capacity of the Resort's current wastewater facilities and no upgrades are anticipated to be necessary.

6. RECYCLED WATER SOURCE ALTERNATIVES ANALYSIS

As discussed previously herein, the resort has dual plumbing allowing the possibility of using recycled water for a number of onsite uses instead of potable water sources. Currently, however, no source of recycled water is available to the Resort even though there is recycled water piping nearby.

It is believed that the existing recycled water plumbing at the Resort does not fully comply with Title 22 standards, which is a requirement of the Subregional System to obtain a service connection. (This has not been independently confirmed.). There are two potential sources of recycled water: purchase recycled water produced at the LTP from Rohnert Park or construct an on-site wastewater treatment facility to provide their own source of recycled water.

For the purposes of this study, it was assumed that all recycled water must be tertiary recycled water, as defined by Title 22, because some planned uses, such as toilet flushing and spray irrigation, could potentially result in close human contact. Recycled water uses that may not result in close human contact, such as drip irrigation, may not require tertiary recycled water, but separating different types of recycled water would be infeasible.

Regulations for recycled water use will depend on the source. If the Resort were to construct their own wastewater treatment facilities, the use of recycled water would be subject to federal regulations. However, if recycled water is purchased from either Rohnert Park or the City of Santa Rosa, the Resort will need to comply with California Title 22 regulations because Title 22 requires that producers of recycled water ensure compliance by all end users.

6.1 Purchasing Recycled Water

It is our understanding that the Tribe attempted to purchase tertiary recycled water directly from the LTP for the existing Resort project but was denied due to Resort facilities not meeting City of Santa Rosa requirements. As mentioned above, this may be due to the onsite recycled water piping being constructed to a different standard that may not be equivalent to CA Title 22.

Rohnert Park is an authorized reseller of tertiary recycled water from the LTP and sells it to customers within the City. Rohnert Park has expressed interest in serving the Resort facilities with recycled water; the Tribe would need to negotiate an agreement with Rohnert Park for cost and available volumes to connect to the system. This may or may not be possible for the existing facilities due to the stated issues with Title 22 compliance, but should be possible for the expansion project.

Rohnert Park currently has an insufficient supply of recycled water to meet their current customer demands and therefore may not be able to supply recycled water to the Tribe without increasing their recycled water allotment from the LTP. Therefore, for Rohnert Park to serve the Resort with recycled water, Rohnert Park would need to negotiate with the subregional partners for an increased volume of recycled water. Successful negotiation may be feasible with the expansion of the Resort sending more wastewater to the LTP. The formula for determining each subregional partner's allotment of recycled water is proportional to each partner's wastewater generation. It stands to reason the Resort could potentially negotiate to receive back as recycled water at least the amount of newly generated wastewater resulting from the expansion and as based on that formula.

The Resort has the unique ability to use recycled water throughout the year, not just during the irrigation season like most other recycled water uses within Rohnert Park. For this reason, it may also be possible to negotiate differing recycled water allotments by season, and potentially satisfy all of their recycled water needs during the off-peak, non-irrigating periods. This could potentially allow the Resort to use recycled water for all (or nearly all) of the available uses during the low demand period of the year, and perhaps less during the peak use months, but still resulting in a significant overall offset of potable water use on an annual basis.

Depending on the requirements imposed by either the City of Santa Rosa or Rohnert Park, the Resort may need to construct a new recycled water system for only the new facilities that meets the City of Santa Rosa's requirements. Recycled water from the LTP could be used exclusively to serve the recycled water needs of the new facilities while all existing facilities would continue to be served by potable water. There is a potential to offset an average of 90,100 gpd by only serving the expansion facilities. The result of this arrangement would reduce the average daily withdrawal from the groundwater wells from the currently projected 235 gpm to approximately 172 gpm. Resultant overall groundwater demands would be 247,700 gpd (the annual average water demand 337,800 gpd less new facilities recycled water potential of 90,100 gpd). The resultant average flow rate would be below the 200 gpm significance threshold evaluated as part of the Resort's initial construction.

In brief summary, there are three alternatives potentially available for purchasing recycled water from Rohnert Park through the subregional system. They include:

- A full-year connection for all recycled water system demands, including irrigation.
- An off-season-only connection for all non-irrigation recycled water system demands.
- A full-year connection for recycled water demands associated with the expansion project only.

6.2 ON-SITE WASTEWATER TREATMENT

If purchasing recycled water is not possible, there are several wastewater treatment technologies that produce highly filtered, tertiary-level effluent suitable for onsite reuse that could be suitable for the Resort. The most prevalent technology for treating wastewater is the activated sludge process in which aerobic microorganisms remove soluble carbohydrates and nutrients from municipal wastewater. A membrane bioreactor (MBR) is an activated sludge treatment system that utilizes porous membranes that allow clean water to pass yet retain aerobic microorganisms in the treatment reactor. The membranes have very small pores that produce a high-quality effluent that can then be disinfected and reused without additional filtration. Additionally, MBRs have a smaller footprint than most other wastewater treatment technologies which reduces site development and construction costs. For these reasons, MBRs were considered the best technology for on-site wastewater treatment generation for the uses at the Resort and are the treatment technology considered for all on-site wastewater treatment alternatives in this study.

It should be noted that the operation and maintenance of an on-site wastewater treatment system would either need to be performed by a contract operator or the Tribe would need to employ staff with the proper training and qualifications to operate an MBR system.

Three variations or alternatives for on-site wastewater treatment were explored and compared based on the potential they could provide towards reducing potable well water demand, the subsequent treatment plant sizing requirements needed, and the resulting volume of untreated wastewater still needing to be conveyed to the Laguna Wastewater Treatment Plant (or conversely, the amount of excess recycled water produced and needing disposal). These alternative examples are not meant to be exhaustive, they each focus on fulfilling one potential case. The Tribe may find a hybrid solution would be more suitable. The alternatives considered are as follows:

- Alternative 1 – Treat sufficient wastewater to produce only enough recycled water to offset the projected increase in water demands from the Resort expansion project. (Minimum Alternative.)

- Alternative 2 – Treat sufficient wastewater to produce enough recycled water to meet all (or most) recycled water demands of the expanded Resort. (Moderate Alternative.)
- Alternative 3 – Treat all of the wastewater produced by the expanded Resort. (Maximum Alternative.)

Both Alternative 2 and 3 each contain a sub-alternative (2b and 3b) which includes the installation of a large effluent storage tank for periods when sewage production is insufficient to meet recycled water demand. The sub-alternatives aim to fully eliminate using well water to satisfy recycled water demands.

6.2.1 Water Balance Results

A water balance was developed for each alternative to estimate the total anticipated demand on the wells, the total recycled water production capacity and total remaining wastewater flows to be sent to the LTP for treatment. The water balancing results are discussed in the following sections. Each water balance utilizes monthly projected water demands and projected wastewater generation for the expanded Resort and are presented in Table 6-1.

Table 6-1 Projected Monthly Water Demands and Wastewater Generation

Month	Total Projected Water Demand (All Uses), gal	Projected Recycled Water Demand, gal	Total Projected Sewer Generation, gal
January	8,483,000	4,155,000	7,240,000
February	7,960,000	3,928,000	6,809,000
March	8,747,000	4,471,000	7,344,000
April	8,940,000	4,779,000	7,269,000
May	10,202,000	6,625,000	7,650,000
June	11,975,000	8,828,000	8,342,000
July	12,795,000	9,698,000	8,868,000
August	12,702,000	9,476,000	8,809,000
September	12,382,000	9,028,000	8,858,000
October	11,545,000	7,924,000	8,249,000
November	9,228,000	5,393,000	7,211,000
December	8,326,000	3,797,000	7,135,000
Annual Total	**123,285,000**	**78,102,000**	**93,784,000**

6.2.1.1 Alternative 1

Alternative 1 generates sufficient recycled water to offset most of the projected increase in demand due to the expansion. The projected increase to water demands, taken from Table 4.1, is approximately 56 MG. Sizing on-site wastewater treatment facilities sufficiently to meet minimum monthly recycled water demands (e.g. December demands) is nearly equal to the projected demand increases. By sizing the treatment facilities to meet winter recycled water needs, recycled water demands only need supplementing in the summer months. Another advantage of this alternative is that the existing sewer lift station could be utilized for equalization of flows to the new WWTP.

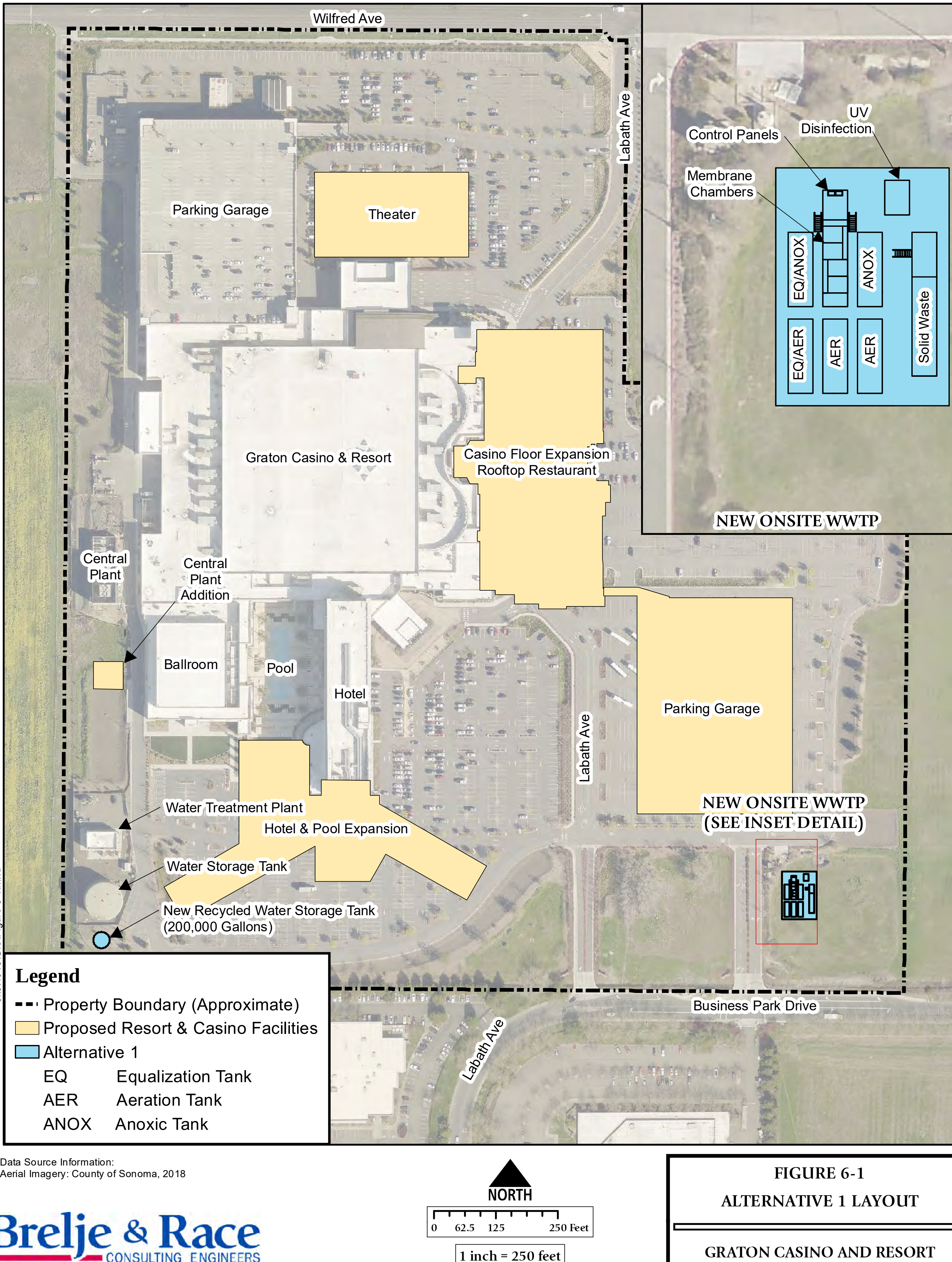
The water balance results for Alternative 1 are presented in Table 6-2. The treatment technology allows for up to a 20 percent variability in production volumes which is accounted for in the balance equations.

Table 6-2 Alternative 1 Water Balance Results

WWTP Sized to Produce Minimum Monthly RW Flows (with 20% ramp up/down capacity)				
Month	**On-Site Recycled Water Production, gal**	**Projected Remaining WW Flow to LTP, gal**	**Projected Potable Water Needed to Supplement Recycled Water Demand, gal**	**Total Projected Potable Water Demand, gal**
January	4,155,000	3,085,000	-	4,328,000
February	3,928,000	2,881,000	-	4,033,000
March	4,471,000	2,872,000	-	4,276,000
April	4,409,000	2,860,000	370,000	4,531,000
May	4,556,000	3,094,000	2,069,000	5,646,000
June	4,409,000	3,933,000	4,419,000	7,566,000
July	4,556,000	4,312,000	5,142,000	8,238,000
August	4,556,000	4,253,000	4,920,000	8,146,000
September	4,409,000	4,449,000	4,619,000	7,973,000
October	4,556,000	3,693,000	3,368,000	6,989,000
November	4,409,000	2,802,000	984,000	4,819,000
December	3,797,000	3,339,000	-	4,529,000
Annual Total	**52,211,000**	**41,573,000**	**25,891,000**	**71,074,000**

This alternative reduces the annual wastewater flows to the LTP from 93.7 MG to approximately 41.5 MG, a reduction of nearly 56 percent. Potable water demands to supplement the recycled water system are reduced from a projected level of 78.1 MG to approximately 25.9 MG. This remaining volume of potable water would still be needed to meet recycled water demands throughout the year. Overall, total annual projected demand for potable water is reduced from 123.3 MG to approximately 71.1 MG, a 42 percent reduction. (Or, from 235 gpm to 135 gpm).

A preliminary layout of the treatment plant and the other auxiliary facilities associated with Alternative 1 are presented in Figure 6-1.



10/21/2022 COONEY J:\J4919\GIS\Figure 6-1.mxd

Data Source Information:
Aerial Imagery: County of Sonoma, 2018

Brelje & Race CONSULTING ENGINEERS
475 Aviation Blvd. Suite 120, Santa Rosa, CA 95403

FIGURE 6-1
ALTERNATIVE 1 LAYOUT

GRATON CASINO AND RESORT
OCTOBER 2022

6.2.1.2 Alternative 2

Alternative 2a sizes the on-site wastewater treatment facilities to meet the maximum recycled water demands, whenever possible. There is insufficient wastewater available to cover all potential recycled water uses directly, except the months that recycled water use is greater than wastewater generation. The water balance results for Alternative 2a are presented in Table 6-3.

Table 6-3 Alternative 2a Water Balance Results

Alternative 2a-WWTP Sized to Meet Max RW Demands				
Month	**On-Site Recycled Water Production, gal**	**Projected Remaining WW Flow to LTP, gal**	**Projected Potable Water Needed to Supplement Recycled Water Demand, gal**	**Total Projected Potable Water Demand, gal**
January	4,155,000	3,085,000	-	4,327,000
February	3,927,000	2,882,000	-	4,032,000
March	4,471,000	2,873,000	-	4,276,000
April	4,779,000	2,490,000	-	4,160,000
May	6,625,000	1,025,000	-	3,577,000
June	8,342,000[1]	-	486,000	3,634,000
July	8,868,000[1]	-	831,000	3,927,000
August	8,809,000[1]	-	667,000	3,893,000
September	8,858,000[1]	-	170,000	3,525,000
October	7,924,000	325,000	-	3,621,000
November	5,393,000	1,817,000	-	3,835,000
December	3,797,000	3,339,000	-	4,529,000
Annual Total	**75,948,000**	**17,836,000**	**2,154,000**	**47,336,000**

1 Recycled water production is limited by total wastewater generated.

Alternative 2a results in a reduction in wastewater flow sent to the LTP from 93.7 MG to approximately 17.8 MG annually. Only about 2.1 MG of potable well water would still be needed to meet all recycled water demands in the summer when recycled water demands are greater than the amount of wastewater generated. The resulting total annual projected demand on the potable water wells is reduced from 123.3 MG to 47.3 MG, a reduction of nearly 62 percent.

A preliminary layout of the treatment plant and the other auxiliary facilities associated with Alternative 2a are presented in Figure 6-2.

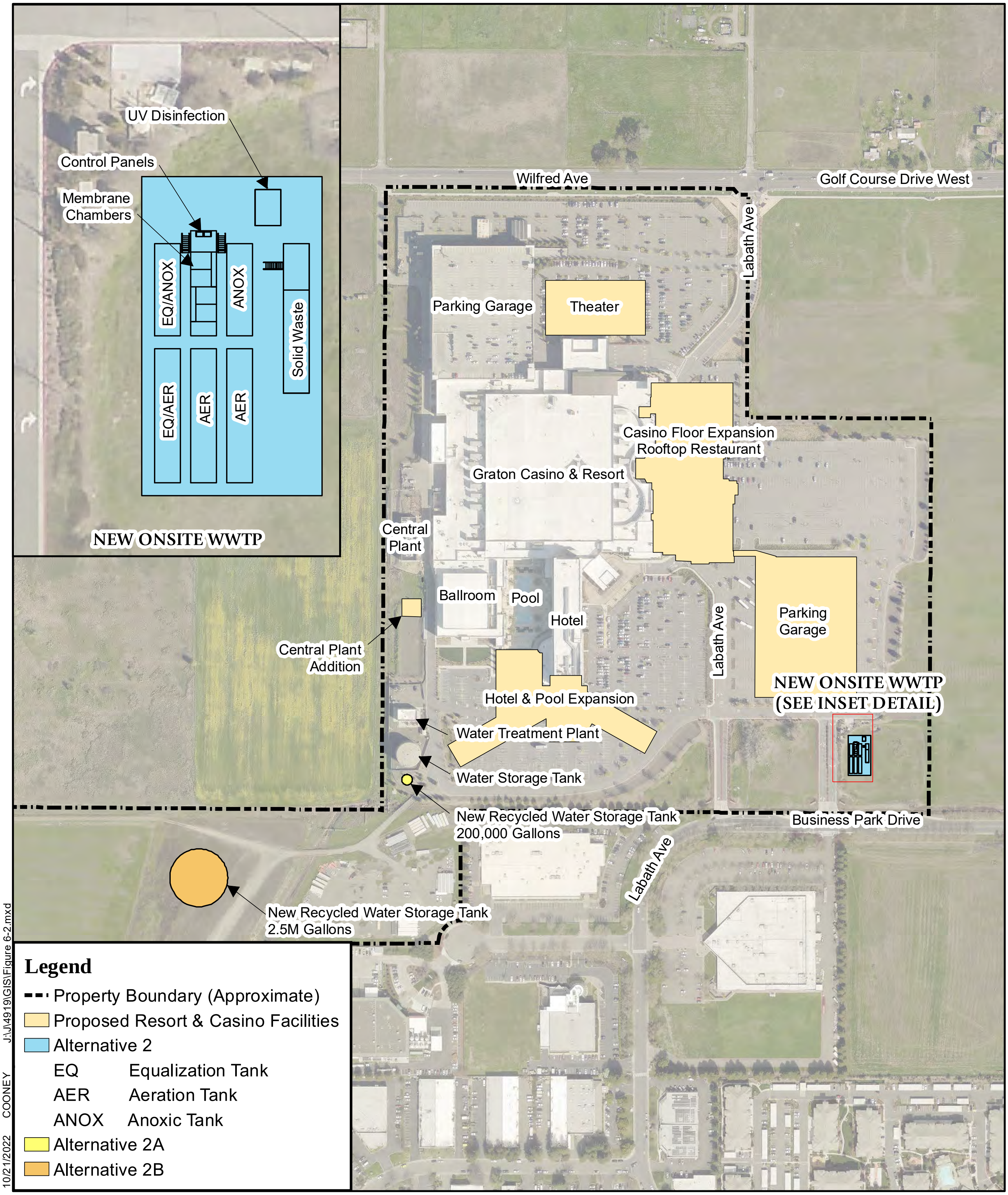
Alternative 2b is the same as Alternative 2a except includes the addition of a large storage tank sized to allow for all recycled water demand to be met with treated effluent from on-site wastewater treatment. Essentially, this alternative maximizes recycled water production and storage, and reduces the potable water demand to as low as it possibly can be. Table 6-4 presents the water balance results for this variation of Alternative 2.

Table 6-4 Alternative 2b Water Balance Results

Alternative 2b-WWTP Sized to Meet Max RW Demand + Storage					
Month	**On-Site Recycled Water Production, gal**	**Recycled Water Use from Storage, gal**	**Volume of Recycled Water Stored, gal**	**Projected Remaining WW Flow to LTP, gal**	**Total Projected Potable Water Demand, gal**
January	4,155,000	-	-	3,085,000	4,327,000
February	3,927,000	-	-	2,882,000	4,032,000
March	4,471,000	-	-	2,873,000	4,276,000
April	5,908,000	-	1,129,000	1,361,000	3,032,000
May	7,650,000	-	1,025,000	-	2,552,000
June	8,342,000	486,000	-	-	3,634,000
July	8,868,000	831,000	-	-	3,927,000
August	8,809,000	667,000	-	-	3,893,000
September	8,858,000	170,000	-	-	3,525,000
October	7,924,000	-	-	325,000	3,621,000
November	5,393,000	-	-	1,817,000	3,835,000
December	3,797,000	-	-	3,339,000	4,529,000
Annual Total	**78,102,000**	**2,154,000**	**2,154,000**	**15,682,000**	**45,183,000**

To eliminate all potable water used to supplement the recycled water systems and irrigation at the Resort, construction of a 2.2 MG clear well, or dedicated storage tank for treated effluent would be necessary. The total annual volume of wastewater sent to the LTP is subsequently reduced further from Alternative 2a to roughly 15.7 MG. The total annual projected demand for potable water is also reduced to the minimum possible (based on the projections), or approximately 45.1 MG (86 gpm). This would be an overall reduction of over 63 percent.

A preliminary layout of the treatment plant and the other auxiliary facilities associated with Alternative 2b are presented in Figure 6-2.



10/21/2022 COONEY J:\J4919\GIS\Figure 6-2.mxd

Data Source Information:
Aerial Imagery: County of Sonoma, 2018

Brelje & Race
CONSULTING ENGINEERS
475 Aviation Blvd. Suite 120, Santa Rosa, CA 95403

NORTH

0 100 200 400 Feet

1 inch = 400 feet

FIGURE 6-2
ALTERNATIVE 2 LAYOUT

GRATON CASINO AND RESORT
OCTOBER 2022

6.2.1.3 Alternative 3

Alternative 3a sizes wastewater treatment facilities to treat all projected wastewater generated at the Resort. Instead of sending excess waste flows to the LTP, there will be excess recycled water that either needs to be handled onsite or somehow delivered back to the Rohnert Park's recycled water system. The added benefit of this alternative provides an opportunity to conduct groundwater recharge to further benefit the aquifer in the groundwater basin. Although, whether recharge is truly viable is not known and would require further analysis. The water balance results for Alternative 3a are presented in Table 6-5.

Table 6-5 Alternative 3a Water Balance Results

Alternative 3a-WWTP Sized for Max Sewer Flow				
Month	**On-Site Recycled Water Production, gal**	**Excess Recycled Water for Disposal, gal**	**Projected Potable Water to Supplement Recycled Water Demand, gal**	**Total Projected Potable Water Demand, gal**
January	7,240,000	3,085,000	-	4,327,000
February	6,809,000	2,882,000	-	4,032,000
March	7,344,000	2,873,000	-	4,276,000
April	7,269,000	2,490,000	-	4,160,000
May	7,650,000	1,025,000	-	3,577,000
June	8,342,000	-	486,000	3,634,000
July	8,868,000	-	831,000	3,927,000
August	8,809,000	-	667,000	3,893,000
September	8,858,000	-	170,000	3,525,000
October	8,249,000	325,000	-	3,621,000
November	7,211,000	1,817,000	-	3,835,000
December	7,135,000	3,339,000	-	4,529,000
Annual Total	**93,784,000**	**17,836,000**	**2,154,000**	**47,336,000**

The results for this alternative are similar to Alternative 2a. Approximately 2.2 MG of potable water would still be needed to meet all recycled water demands throughout the year. The total annual projected potable demand is reduced to approximately 47.3 MG. Under this alternative, a total of 17.8 MG of excess recycled water is generated, although mostly in the non-irrigation seasons. Consideration of this alternative would be appropriate if there were an available use for the excess recycled water, otherwise the excess would need proper disposal.

Assuming subsurface disposal (i.e. leach field), approximately 2.9 acres would be required based on 200 percent disposal area and soil conditions noted from the USGS soil maps. Actual site and soil investigations would need to be performed prior to the final area requirements being determined. Other disposal options available, such as spray disposal, may also be suitable however typically require a large land area and spray irrigation with recycled water has seasonal restrictions that may require effluent storage. Sub-surface disposal of treated effluent as described may be considered recharge.

A preliminary layout of the treatment plant and the other auxiliary facilities associated with Alternative 3a are presented in Figure 6-3.

Alternative 3b uses the same size treatment facilities as Alternative 3a but adds a storage tank that allows all recycled waste demand to be met with effluent from on-site wastewater treatment. The water balance results for Alternative 3b are presented in Table 6-6.

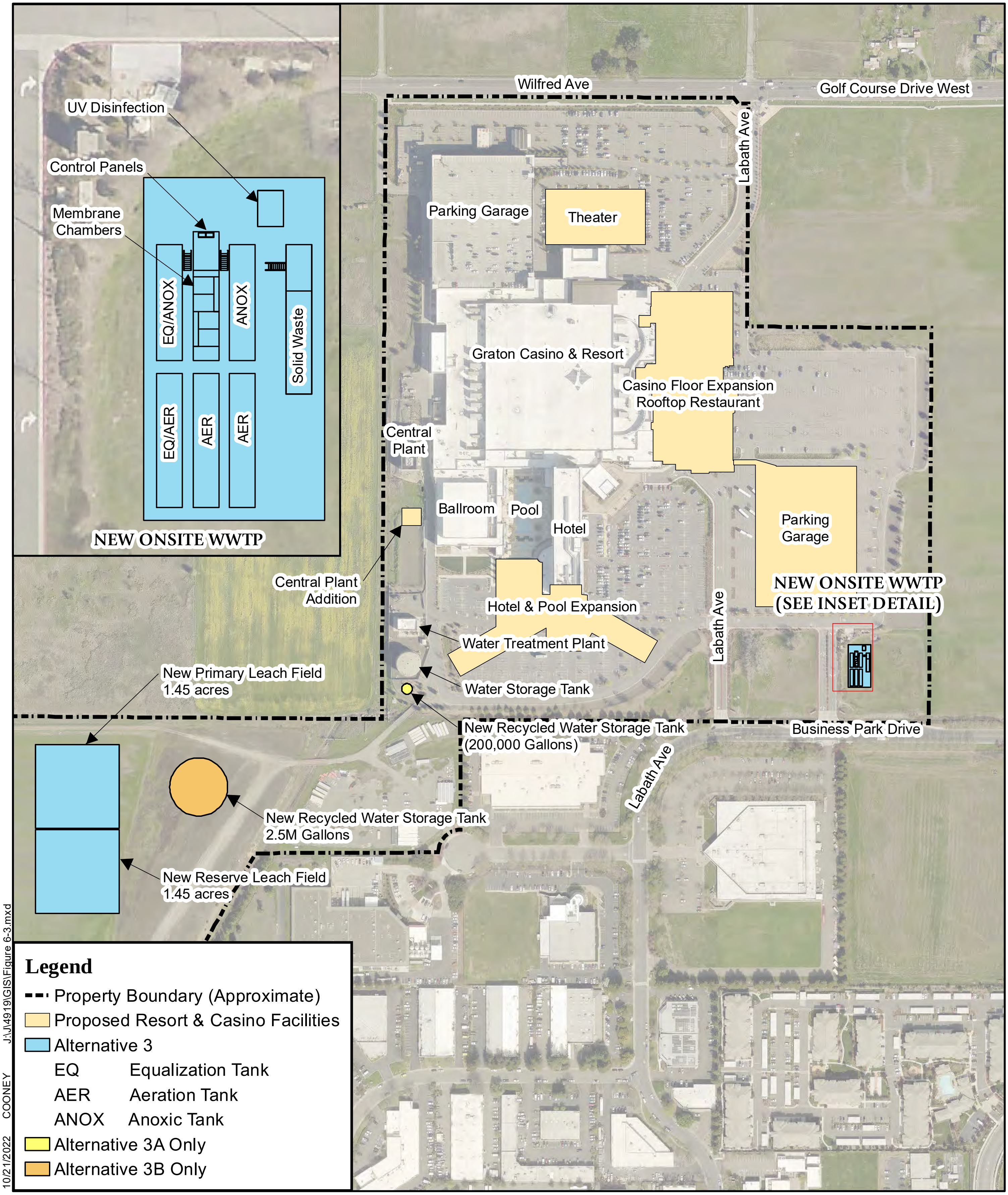
Table 6-6 Alternative 3b Water Balance Results

Alternative 3b-WWTP Sized for Max Sewer Flow + Storage					
Month	**On-Site Recycled Water Production, gal**	**Recycled Water from Storage, gal**	**Volume of Recycled Water Stored, gal**	**Excess Recycled Water for Disposal, gal**	**Total Projected Potable Water Demand, gal**
January	7,240,000	-	-	3,085,000	4,327,000
February	6,809,000	-	-	2,882,000	4,033,000
March	7,344,000	-	-	2,873,000	4,276,000
April	7,269,000	-	1,129,000	1,361,000	4,160,000
May	7,650,000	-	1,025,000	-	3,577,000
June	8,342,000	486,000	-	-	3,148,000
July	8,868,000	831,000	-	-	3,096,000
August	8,809,000	667,000	-	-	3,226,000
September	8,858,000	170,000	-	-	3,355,000
October	8,249,000	-	-	325,000	3,621,000
November	7,211,000	-	-	1,817,000	3,835,000
December	7,135,000	-	-	3,339,000	4,529,000
Annual Total	**93,784,000**	**2,154,000**	**2,154,000**	**15,682,000**	**45,183,000**

Alternative 3b is similar to 3a with the addition of 2.2 MG of effluent storage to meet all recycled water demands. No potable water would be needed to meet recycled water demands. The total annual projected demand for potable water is reduced to as low a figure as possible, or approximately 45.1 MG. Under both Alternative 3a and 3b, no wastewater would be sent to the LTP for treatment.

Alternative 3b produces slightly less excess recycled water, approximately 15.7 MG, that would require disposal. The required disposal area is not significantly reduced and is similar to Alternative 3a.

A preliminary layout of the treatment plant and the other auxiliary facilities associated with Alternative 3b are presented in Figure 6-3.



J:\J4919\GIS\Figure 6-3.mxd COONEY 10/21/2022

Data Source Information:
Aerial Imagery: County of Sonoma, 2018

Brelje & Race
CONSULTING ENGINEERS
475 Aviation Blvd. Suite 120, Santa Rosa, CA 95403

NORTH

0 100 200 400 Feet

1 inch = 400 feet

FIGURE 6-3
ALTERNATIVE 3 LAYOUT

GRATON CASINO AND RESORT
OCTOBER 2022

6.2.2 Land Requirements

For the MBR package plant assumed for treating wastewater on site and producing tertiary effluent for reuse, the footprint for the physical components will vary some for each alternative. Components are anticipated to include a headworks screen or grinder, the MBR package plant, sludge handling and storage (a byproduct of treatment) and disinfection equipment. It is also likely that a small tank and feed pump(s) will be needed for influent equalization purposes, and similarly, on the effluent side, at least a small clearwell will be necessary. The treatment systems can be located outdoors, but a cover or building to house all or most of the facilities would be ideal.

Alternative 1 is estimated to require approximately 3,200-square feet for the MBR and associated equipment. The overall footprint of the treatment plant would be approximately 10,000-square feet, although it may not include the sludge handling facilities necessary.

Alternatives 2a and 3a have the same treatment requirements and need approximately 4,2-square feet for the MBR. The estimated footprint for all facilities except sludge handling would be approximately 12,000-square feet.

Alternatives 2b and 3b each require the addition of a 2.2 MG clearwell or separate storage tank for holding recycled until needed. The tank footprint can vary, but assuming a 3:1 diameter to height ratio, approximately 12,000 sq. ft. would be necessary.

Alternatives 3a and 3b could utilize groundwater recharge and would require approximately 2.9 acres with an expected excavated volume of approximately 12,000 cubic-yards.

6.2.3 Alternative Cost Estimates

A price comparison analysis between the three wastewater treatment plant alternatives presented previously has been prepared including some ancillary costs and is presented herein following. Other costs such as installation, permitting, sitework, and solid waste disposal are not included in this analysis.

For this study, Cloacina Package Treatment Solutions (Cloacina), a manufacturer of package MBR waste treatment systems, was consulted and all budgetary capital and operation and maintenance costs are based on a Cloacina MBR installation. There are other manufacturers, such as Smith & Loveless Inc., that manufacturer similar systems that may be considered should an onsite wastewater treatment alternative is selected.

In all alternatives the base price for the wastewater treatment plant includes the preliminary design, influent lift station components, internal MBR components, electrical controls, effluent pumps, total construction, testing, start-up, training, and 12 months of technical support. There is also an option to add one, or more equalization tank if necessary. All wastewater treatment plant costs are based on budgetary level estimates from Cloacina.

The wastewater treatment plant accessories included in the cost estimates are not necessarily all required but may be desirable options. An ultraviolet (UV) Disinfection System is one method to meet tertiary standards without leaving residual chlorine, however disinfection by chlorination may be more cost effective. A sludge handling system will be required for management of solids removal. A DRYPAC Sludge Handling system was used for estimating purposes although there may be other suitable options. Each alternative also includes a minimum of 200,000 gallons of effluent storage to provide approximately 24 hours of recycled water for operational buffering and emergency supply.

Table 6-7 Wastewater Treatment Plant Alternatives Cost Estimates

Description	Component Costs				
	Alternative 1	Alternative 2		Alternative 3	
		a	b	a	b
Wastewater Treatment Plant	$ 2,650,000	$ 3,060,000	$ 3,060,000	$ 3,720,000	$ 3,720,000
UV Disinfection System	$ 250,000	$ 470,000	$ 470,000	$ 470,000	$ 470,000
DRYPAC Sludge Handling System	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000
Optional Wastewater Treatment Plant Accessories					
Sound Attenuation	$ 48,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Headworks	$ 140,000	$ 140,000	$ 140,000	$ 242,000	$ 242,000
Anoxic/Headworks Covers	$ 17,000	$ 20,000	$ 20,000	$ 33,000	$ 33,000
Awnings	$ 50,000	$ 60,000	$ 60,000	$ 70,000	$ 70,000
Shelf Spare Equipment	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000
Effluent Tank	$ 500,000	$ 500,000	$ 4,500,000	$ 500,000	$ 4,500,000
Site Development Costs	$ 475,000	$ 575,000	$ 600,000	$ 625,000	$ 650,000
Disposal Area, $80/CF	N/A	N/A	N/A	$ 960,000	$ 960,000
Total	**$ 4,700,000**	**$ 5,445,000**	**$ 9,470,000**	**$ 7,240,000**	**$ 11,265,000**

6.2.4 Operation & Maintenance Costs

Operation and maintenance (O&M) costs were developed based on known operation costs provided by the package treatment plant manufacturer. These costs have been broken down by task and frequency of the task on an annual basis using a staff rate of $50/hour.

Table 6-8 Wastewater Treatment Plant O&M Cost Estimates

Operation and Maintenance Costs	Alternative 1	Alternative 2	Alternative 3
Units	Annual Operating Cost	Annual Operating Cost	Annual Operating Cost
Equipment Consumables	$ 600	$ 600	$ 600
Equipment Spare Parts	$ 4,000	$ 4,000	$ 4,000
Power	$ 42,000	$ 42,000	$ 49,000
Labor (one worker)	$ 42,000	$ 42,000	$ 42,000
Membrane CIP Chemicals	$ 8,000	$ 8,000	$ 8,000
Annual Estimate	$ 97,000	$ 97,000	$ 104,000
Operating Cost per 1,000 gallons of Capacity	$ 480	$ 380	$ 340

The cost for treating wastewater and producing recycled water varies from approximately $480 to $340 per 1,000 gallons.

Rohnert Park purchases recycled water from LTP at a rate of $300 per acre foot or approximately $1 per 1,000 gallons. The exact rate that Rohnert Park may charge the Resort for purchasing recycled water is unknown but even with a significant mark-up, the cost for purchasing recycled water is significantly lower than producing recycled water.

6.2.5 Regulatory Requirements and Considerations

As the Resort is located on federal trust land, the main regulatory body for the treatment and disposal of wastewater onsite is the US Federal Environmental Protection Agency (EPA).

Any wastewater treatment, disposal facilities, and reuse of recycled water would be regulated by the EPA under the Safe Drinking Water Act and the Clean Water Act. Any auxiliary facilities that could produce air pollution such as generators would be regulated by the EPA through the Clean Air Act.

Other operational considerations such as biosolids management, discussed in the following sections, could require the participation of other permitting agencies.

6.2.6 Biosolids Management

Biosolids are a byproduct of wastewater treatment which require regulated steps to be taken to ensure proper disposal. The DRYPAC component of the process separates the liquids from the solid wastes. After being treated chemically, the solids, (sludge), are pressed producing a biosolid product which can be used beneficially as compost for agriculture.

All treatment plant costs presented include the cost of the DRYPAC system to process the MBR waste stream into biosolids. However, there are multiple management options for the biosolids that should be considered prior to selection of a preferred alternative. These options include:

- Production and disposal of biosolids onsite.
- Production of biosolids onsite and disposal of biosolids offsite.
- Production and disposal of biosolids offsite.

These options and the potential regulatory impacts are discussed in the following sections.

6.2.6.1 Onsite Production and Disposal

For onsite disposal, the DRYPAC component to the wastewater treatment plant would dewater and press the sludge, creating a biosolid "cake." Onsite disposal (on Federal Trust land) would fall under regulation by the EPA (40 CFR Part 503) which defines requirements for the final use or disposal of biosolids. These uses include land application for the conditioning of soil or fertilization of crops or other vegetation, placed on a surface disposal site, or fired in a biosolids incinerator.

The onsite disposal option offers more autonomy although land requirement would be more intrusive as all of the biosolids would require agricultural land for disposal.

6.2.6.2 Onsite Production and Offsite Disposal

For offsite disposal, the same process as onsite disposal is employed, but instead of using the finished compost product onsite, the finished product would be trucked and applied on non-tribal land. This application would fall under the regulatory purview of the North Coast Regional Water Quality Control Board (NCRWQB) (Water Quality Order No. 2004-12-DWQ).

This alternative would not require reserving onsite land for disposal but would require the availability of other lands for disposal. In most cases, this alternative would require more extensive testing of the biosolids to comply with NCRWQB requirements.

6.2.6.3 Offsite Production and Disposal

For the offsite disposal of sewage sludge, there would not be a need for the DRYPAC component of the treatment plant. The sludge would be collected and trucked to a disposal facility which would handle all regulatory permitting.

Disposing of the raw sewage sludge would require less onsite facilities with a smaller land footprint and less direct involvement of regulatory agencies but would require daily truck removal based on estimated sludge production from the wastewater treatment plant.

7. GROUNDWATER BASIN ANALYSIS AND DISCUSSION (ENGEO)

7.1 GEOLOGY AND HYDROGEOLOGY BACKGROUND

7.1.1 Site Geology

The Resort is located within the Santa Rosa Plain Sub-Basin, relatively level at approximately 90 feet above mean sea level. The Rancheria is located within the portion of the Coast Ranges geologic province of California, a series of northwest trending ridges and valleys. Bedrock in the province has been folded and faulted during regional uplift beginning in the Pliocene period, about 4 million years before present. The southern portion of the Coast ranges hosts the Santa Rosa Valley Basin, which is made up of three sub-basins: the Healdsburg Area Sub-Basin, the Rincon Valley Sub-Basin, and the Santa Rosa Plain Sub-Basin. The Rancheria is in the Santa Rosa Sub-Basin.

The geology within the subbasin is broadly grouped into either Mesozoic Era (>66 million years old) basement rocks, and younger volcanic and sedimentary units from the Cenozoic Era (<66 million years old). The Mesozoic basement rocks contain metamorphic, igneous, and metasedimentary rocks from the Franciscan Complex, Coast Range Ophiolite, and Great Valley Sequence. The younger volcanic and sedimentary rocks and unconsolidated sediments, typically Tertiary and Quaternary aged, overlie these basement rocks (Santa Rosa Groundwater sustainability plan, 2021; Sweetkind et al. 2013; Wagner and Gutierrez 2017).

Locally, the site is mapped as underlain by Holocene alluvial fan and floodplain overbank deposits. These fine-grained deposits are found on gently sloping portions of the valley floor and are primarily composed of clay with interbedded lenses of sand and occasionally gravel (Qhff; Clahan et al, 2003). The lenses of coarser grained deposits are typically elongated and oriented in the down-fan, or down valley, direction, providing geologic conduits for groundwater flow (Knudsen et al, 2000).

According to the United States Department of Agriculture (USDA) Web Soil Survey, the predominant mapped soil units within the study area generally consist of the following:

Mapped Unit Name	Hydrologic Soil Group	Water Capacity (Inches)	Approximate Percentage of Study Area
Clear Lake clay (CeA) sandy, substratum, drained, 0 to 2 percent slopes	C/D	Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)	91.4 (90%)
Wright loam (WoA) shallow, wet, 0 to 2 percent slopes	D	Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)	8.4 (<10%)
Wright loam (WhA) wet, 0 to 2 percent slopes	D	Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)	0.2 <1%

As shown in the table above, study area soils are predominantly C/D soils (approximately 90% of the area). Approximately 10% of the study area is underlain by soils of the D HSGs, respectively, while A and B soils are not found at the site. This means that soils at the site predominately have slow infiltration with an impeding layer.

The Rodgers Creek fault is located approximately 4.5 miles to the east of the Resort. It is a well constrained, right lateral fault, which is connected to the Hayward Fault (Watt et al., 20116). The 2018 USGS report of Recently Active Traces of the Rodgers Creek Fault states that the fault slips at a rate of 6-10 mm/yr., and that the 30-year mean probability of a magnitude (M)>6.7 earthquake is estimated at 33% (Hecker, 2018). The most recent surface-rupturing earthquake on the Rodgers Creek Fault was likely between 1715 and 1776 (Hecker et al, 2005).

The northwest-southeast trending Sebastopol fault subcrops immediately to the southwest of the Site and underlies the southern part of Rohnert Park. Based on a pump test run at the Todd Road emergency well (2.5 mi NW from the Site) by the DWR in 1982, this fault may act as a groundwater flow barrier (DWR, 1982), however later studies concluded that water impediment by the fault is inconclusive (AEG, 2016). As a result, the DWR has released multiple groundwater elevation contour maps which vary in their interpretation on the effect of this fault on the groundwater. Since the Sebastopol fault does not offset young alluvial fan deposits, it is assumed to be inactive (AEG, 2016).

Similarly trending northwest-southeast, the North College Fault is found northeast of Rohnert Park and also does not appear to directly influence groundwater flow (DWR, 1987).

7.1.2 Site Hydrogeology

Average annual rainfall for Santa Rosa for the period 1930 to 2020 has been recorded as an average of 29.81 inches as reported in the Santa Rosa Plain Sub-Basin Groundwater Sustainability Plan (SRPGSA, 2021). Rainfall totals were derived from daily precipitation measurements recorded at National Climatic Data Center Station #7965 located at the Sonoma County Airport.

The SRP watershed is mostly within the middle Russian River watershed and includes three main drainage areas which include Mark West Creek, Santa Rosa Creek, and Laguna de Santa Rosa. The Rancheria is located within the Laguna de Santa Rosa drainage area. The Laguna de Santa Rosa watershed drainage is approximately 88-square-miles. The subwatershed collects precipitation and stormflows from the southern and southwestern areas of the SRP watershed upstream of the Santa Rosa tributary, emptying to the north into Mark West Creek.

In general, groundwater flows from the east and west highlands to the Laguna de Santa Rosa. Faults along the subbasin boundary may impede, enhance, or redirect groundwater flow and affect groundwater quality locally. Principal sources of groundwater recharge within the Santa Rosa Plain watershed are direct infiltration or precipitation and infiltrations from streams. The shallow aquifer systems receive most of this type of recharge every year. Recharge that reaches the deeper aquifer zones is less understood but is inferred to come from a combination of leakage from overlying shallow aquifers and mountain-front recharge along the margins of the valley. Deeper recharge may take decades or longer to reach the aquifers, due to long travel paths (SRPGSA, 2021).

We have identified six hydrogeologic units in the vicinity of the Rancheria: Quaternary Alluvial Deposits, Glen Ellen Formation, Wilson Grove Formation, Petaluma Formation, Sonoma Volcanics, and Basement Rocks. Descriptions of each follow, many are derived from a USGS report characterizing the Santa Rosa Plain Watershed (USGS, 2013).

The Quaternary Alluvial deposits are typically found close to modern streams. They contain coarse material which allows these deposits to facilitate the exchange of water between the surface and ground water storage units. Unless a thick layer of clay or silt interferes, typically the groundwater in this unit is unconfined. However, due to large fractions of clay, these deposits only comprise minor aquifers along major streams and beneath the alluvial fans in the area and thus these Quaternary alluvial deposits are not considered a major aquifer source.

The Glen Ellen formation has previously been reported as having a thickness as large as 3,000 ft (e.g., Cardwell, 1958; and Ford, 1975) and small as a few hundred feet thick (Sweetkind et al, 2010). This formation has a high level of compaction and cementation, and it contains a large proportion of clay, either as beds of almost pure clay or as the matrix in coarser grained units. Thus, the permeability of the Glen Ellen Formation is limited.

The Wilson Grove Formation (formerly known as the Merced Formation) is primarily composed of sand, and is thick enough to be subdivided between lower, finer grain deposits, and upper, coarser grained deposits. It is the upper stratigraphic units which are primarily found within the study area of this report. Due to relatively clean sand and low degree of cementation, this formation often has medium to high storability.

The Petaluma formation is divided into three distinct sub-units (lower, middle, and upper), identified by Allen (2003) and Holland et al. (2009) based on grain-size and sorting. The lowest subunit is primarily mudstone and gives the lowest hydraulic conductivity. In contrast, the middle and upper sub-units contain beds of poorly sorted sands and gravels, and thus these subunits have a higher hydraulic conductivity.

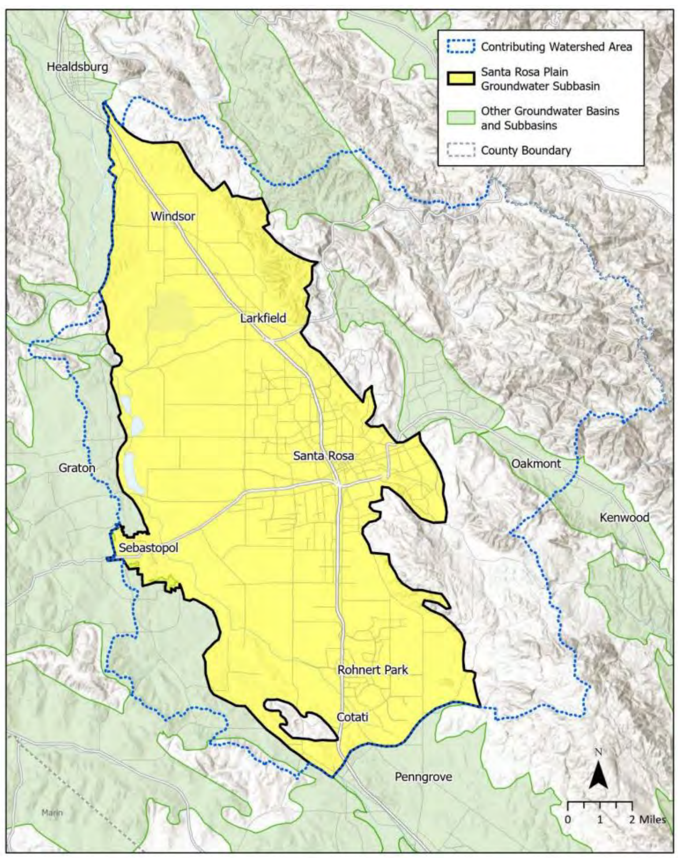
The Sonoma Volcanics contain multiple lithologic units, each of which with different hydrologic properties. Low specific yields are found in unfractured zones in welded tuffs, lavas, thick diatomaceous deposits, clay-rich lahar flow deposits, or hydrothermally altered volcanic rocks. In contrast, high specific yields can be found within zones of rubble between lava flows, scoria, coarse tephra, air fall tuff, and coarse-grained volcaniclastic units. Specific yields and conductivity do not go together in this unit, as fractured zones may provide high conductivity but a low storage volume.

The Basement rocks include the Great Valley Formation, the Franciscan Complex, and Coast Range Ophiolite. These basement rocks typically produce low quantities of water (Cardwell, 1958; Kunkel and Upson, 1960; Page, 1986) and, in comparison to overlying rocks, some report these basement rocks as non-water bearing (Cardwell, 1958; Ford, 1975; Herbst and others, 1982; Kadir and McGuire, 1987). The permeability found in the basement rocks is mostly a result of folding and faulting having created fractures in the rocks. No water wells have been successful in areas where the basement rocks are deeply buried, likely due to increased compaction and cementation of the basement rocks at depth.

7.1.3 Previous Groundwater Studies

<u>Santa Rosa Plain Groundwater Sustainability Agency; Santa Rosa Plain Groundwater Sustainability Plan; December 2021</u>

The Santa Rosa Plain Groundwater Sustainability Plan (GSP) was completed in December of 2021 and submitted to the California Department of Water Resources for review in January of 2022. The GSP builds upon the work done in the 2014 Groundwater Management Plan for the Santa Rosa Plain Sub-Basin and includes projects, management actions, and an implementation plan to achieve locally determined sustainability goals.



Reference: Groundwater Sustainability Plan (SRPGSA, 2021)

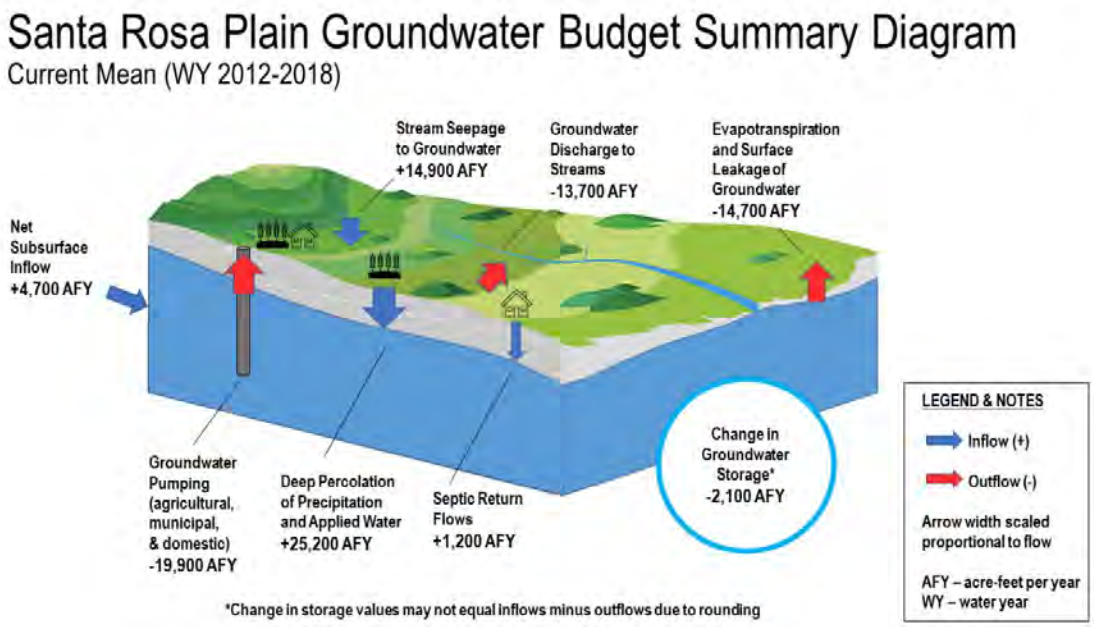
Figure 7-1 Santa Rosa Plain Groundwater Subbasin

The subbasin includes the Town of Windsor, Cities of Cotati, Rohnert Park, Santa Rosa, and Sebastopol, and areas of unincorporated rural communities. The major urban water suppliers in the subbasin are the induvial cities and towns and Cal-American Water Company's Larkfield system. Most of these water suppliers rely primarily on imported Russian River water supplied by Sonoma Water, but they also pump groundwater for supplemental supply, and during droughts and emergencies. The City of Sebastopol relies entirely on groundwater pumped from the subbasin. Residences outside of urban water supply systems rely on groundwater. The exact number of domestic wells is unknown but is estimated to be between 4,000 and 5,500.

Groundwater resources are highly variable throughout the subbasin with productive freshwater aquifers both at shallower depths, generally less than 200 feet where many residential wells are drilled, and at deeper depths, where many municipal, industrial, and agricultural wells are constructed. The Subbasins deepest wells extend to approximately 1,500 feet and no known existing wells extend deeper than 2,000 feet. The deeper aquifer system is generally confined to semi-confined and is not spatially connected with surface water.

A computerized numerical groundwater flow model, the Santa Rosa Plain Hydrologic Model (SRPHM), developed by the USGS in 2014 and revised by Sonoma Water to incorporate more recent data, was used as a groundwater management tool and to calculate the combined groundwater flows into and out of the basin to both the shallow and deep aquifer. The model accounts for precipitation, surface water, and groundwater entering the subbasin through runoff, streams, septic systems, and other sources; and surface water and groundwater leaving the basin through evapotranspiration, streams, pumping, diversions, and other means. The model projects a 50-year climate future characterized by a few very dry years, followed by several wet or very wet years, and then a long drought. This scenario is representative of projected conditions in the North Bay, but is one of multiple options that could have been used.

Major contributors of the current period model (2012-2018) inflows include stream seepage to groundwater (14,900 AFY), net subsurface inflow (4,700 AFY), deep percolation of precipitation and applied water (25,200 AFY), and septic return flows (1,200 AFY). Major contributors of current outflows (2012-2018) include groundwater discharge to streams (-13,700 AFY), evapotranspiration and surface leakage of groundwater (-14,700 AFY), and groundwater pumping (agricultural, municipal, & domestic) (-19,900 AFY).



Reference: Groundwater Sustainability Plan (SRPGSA, 2021)

Figure 7-2 Current Water Budget

Historically (1976-2018), average losses estimated at 600 AFY occurred. Currently, average losses are estimated as 2,100 AFY. For the full projected period from 2021 through 2070, that includes an extended drought beginning in 2050, the simulated average loss of groundwater in storage decreases to 1,400 AFY. This includes an extended drought beginning in 2050. Between 2021 and 2040, estimated losses are projected at 200 AFY reflecting a wet and very wet climate change scenario.

Table ES-1. Summary Historical (WYs 1976-2018), Current (WYs 2012-2018), and Projected (WYs 2021-2070) Average Annual Change in Groundwater Storage (AFY)[a]

Water Budget Periods	
Average, Historical Period (1976-2018)	-600
Average, Current Period (2012-2018)	-2,100
Future Period	
Average (2021-2070)	**-1,400**

Note:
[a] Values rounded to nearest 100.

Reference: Groundwater Sustainability Plan (SRPGSA, 2021)

A sustainable yield, an estimate of the quantity of groundwater that can be pumped on a long-term average annual basis without causing undesirable results, was estimated as 23,900 AF from the modeled period from 2021 to 2040. This value is 39 percent of the total groundwater inflows into the Subbasin and is greater than the average total groundwater pumpage experienced during the current water budget period. However, the annual average projected pumping for the 50-year period from 2021 to 2070 of 26,100 AF exceeds the sustainable yield indicating that projects and management actions are needed to sustainably manage the subbasin and avoid potential future undesirable results.

Groundwater sustainability was assessed using six indicators including groundwater levels, groundwater storage, groundwater quality, land subsidence, seawater intrusion, and interconnected surface water-groundwater. The following is a summary of the assessed indicators for the Santa Rosa Plain Sub-Basin:

- Groundwater levels: Groundwater levels for the shallow aquifer monitoring wells are generally stable. Deeper aquifer monitoring wells show stable levels with southern and western portions of the basin exhibiting increasing trends and a few east and outside of the subbasin exhibiting declining levels. Historically, groundwater level declines exceeding 100 feet in the deep aquifer system occurred in the Rohnert Park-Cotati area associated with increases in municipal groundwater pumping due to population growth in the 1980s and 1990s. These declines have since recovered due to increased use of imported potable water and recycled water and corresponding reduction in municipal groundwater pumping in this area.
- Groundwater storage: The groundwater stored in the shallow and deep aquifer systems is declining on average, with current estimate of 2,100 AFY and with a projected declining estimate of 1,400 AFY.
- Land surface subsidence: Existing data does not indicate inelastic land subsidence is occurring as a result of groundwater pumping.
- Groundwater quality: Monitoring throughout the subbasin finds groundwater quality is generally adequate to support existing beneficial uses. Some localized areas have poor groundwater quality from human-caused impacts.
- Seawater intrusion: Subbasin is not connected to or influenced by the ocean or bay.
- Interconnected surface water and groundwater: Aquatic species and habitats could be adversely affected by depletion of interconnected surface water caused by groundwater pumping.

The measurable objectives were provided as follows:

- Chronic lowering of groundwater levels: Maintain near historical observed ranges while accounting for future droughts and climate variability.
- Reduction in groundwater storage: Maintain near historical observed ranges while accounting for future droughts and climate variability.
- Degraded groundwater quality: Monitor MCLs for arsenic, nitrate, or salts (TDS).
- Subsidence: Any rate of inelastic subsidence caused by groundwater pumping is a significant and unreasonable condition.
- Depletion of interconnected surface water: Maintain groundwater levels within historical observed ranges.

<u>Groundwater Study: Proposed Graton Rancheria Casino and Hotel; Worley Parsons Komex; September 2007</u>

This study was performed as part of the Environmental Impact Statement for the project. This study was performed to assess how the two production wells for the project would affect local groundwater levels. As part of this assessment, the maximum water demand for the alternatives was estimated as 200 gpm (288,000 gpd). For a sustained pumping rate of 200 gpm, a drawdown of 23 feet was predicted in the deeper screened zone.

The report indicated that the proposed project pumping represented a small increase to overall regional current and future groundwater pumping rates (0.5 to 1.7 percent on the Santa Rosa Valley groundwater basin and 2.9 to 4.5 percent in the southern Santa Rosa Plain Sub-Basin) depending on the development alternative. It was considered unlikely that groundwater pumping for the project would cause a resumption of declining groundwater level trends or further migration of the groundwater divide, however that did not imply that the project would have no regional hydrogeologic impacts. Project pumping was expected to result in a small decrease in the rate of recovery from the historical overdraft condition.

An analytical drawdown model was developed to predict water-level impacts due to proposed pumping at the Resort under a sustained pumping rate of 200 gpm. The predicted drawdown at the Resort boundary is 23 feet and attenuates to about 1 foot at a distance of 17,000 feet from the proposed wells. Analysis showed that offsite pumping caused a greater drawdown in deeper wells (greater than 200 feet) than in shallower wells (less than 200 feet deep) and it was expected onsite wells would have a similar effect.

The most serious impact noted was a nearby groundwater user could have their well go dry or rendered unusable because the remaining saturated thickness after drawdown is too thin to support pumping at the required rate. The wells most at risk were expected to be shallow domestic wells near the site. Additionally, well interference was considered to have an impact of additional pumping costs to nearby well users.

Mitigation measures for the project included:

- Implementation of a pumping test and groundwater level monitoring program to inform the mitigation process.
- Production well design based on the pumping test results to minimize shallow zone impacts.
- Implementation of on-Site BMPs and wastewater disposal that will enhance recharge, consideration of off-Site mitigation including in lieu recharge and sponsorship of water conservation measures, and reimbursement of affected nearby well owners.

7.2 Santa Rosa Sub-Basin Analysis

7.2.1 Groundwater Levels

7.2.1.1 Regional

The following long-term trends were observed for the Santa Rosa Sub-Basin as discussed in the GSP (SRPGSA, 2021):

Data indicates that relatively stable groundwater-level conditions are maintained over time or indicate that levels increase slightly upward, with the exception of wells within the southern portion of the Subbasin. A few wells in the Cotati area showed a decline in groundwater levels for the late 1970s and 1980s, which reached a historic low in the early 1990s, followed by a recovery in the early 2000s.

Most shallow aquifer zone wells generally exhibit relatively stable groundwater levels (change of less than +/-1 ft/yr). Some wells within the western subbasin boundary exhibit increasing trends. The deeper zone wells are relatively stable or increasing (at western boundary). A few wells east and outside of the subbasin, within contributing watershed area, show decreasing trends. In general, groundwater flows from the east and west highlands to the Laguna de Santa Rosa.

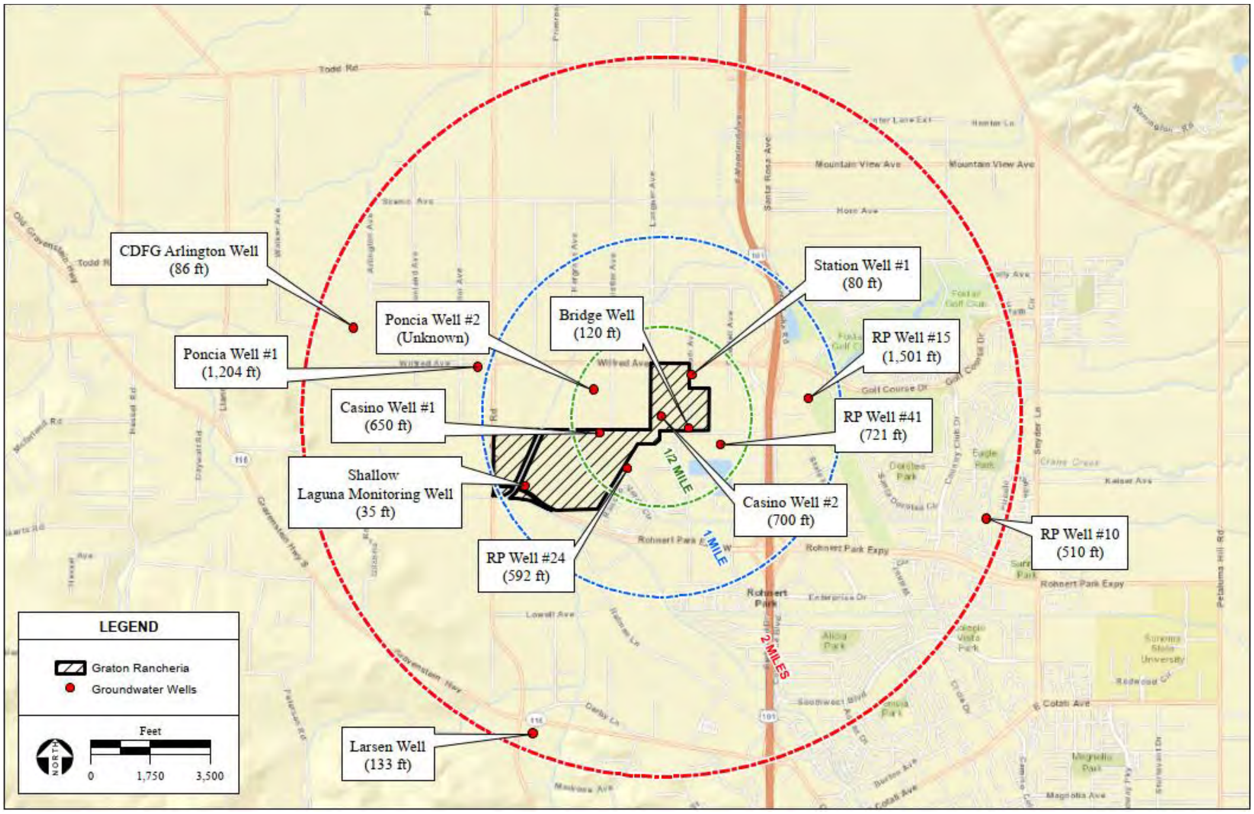
7.2.1.2 Site Vicinity

Groundwater levels and flow directions in the region have changed significantly since the 1950s due to aggressive groundwater extraction, followed by a significant reduction in groundwater in the vicinity of Rohnert Park, where a large groundwater depression existed in the 1970s through 2006 (SRPGSA, 2021). Groundwater levels in the subbasin are generally stable and have recovered since the early 1970s. Groundwater elevations in spring of 2007 showed higher groundwater levels, coinciding with a substantial pumpage reduction at the Rohnert Park Wells primarily due to increased water imported from Sonoma Water's regional aqueduct system, as well as increased conservation and recycled water use. From 2006 to present, groundwater-level elevations have been relatively stable in Rohnert Park wells, with the exception of an approximately 20 foot decline in one well. Seasonal groundwater level fluctuations range from 5 to 30 feet. Seasonal high groundwater levels are typically observed in March to June and seasonal lows in September to November (SRPGSA, 2021).

The Resort was constructed in 2013 with an expansion completed in November of 2016. Groundwater level data has been collected for the Rancheria since 2012 as part of the Graton Rancheria Monitoring Program, although the Resort began extracting in 2013.

In general, prior to construction of the Resort, groundwater elevations tended to decrease from 2010 to 2012 and increase in 2012 and 2013. Prior to groundwater pumping in 2013, groundwater elevations in nearby wells experienced fluctuations of about 30 feet, with periods of low groundwater elevation during the dry seasons and higher groundwater elevation during the wet season which may be related to greater dependence on the wells during the dry season by Rohnert Park.

Figure 7-3 shows groundwater wells within a 2-mile radius of the Resort for which monitoring data is available.



Reference: Analytical Environmental Services (2012)

Figure 7-3 Nearby Groundwater Wells

Appendix A (Groundwater Monitoring Data) provides groundwater monitoring graphs that correspond with these wells. Rohnert Park Wells 10, 24 and 41 have groundwater levels approximately at the same depth as the Casino Wells.

The water surface for Casino Well #1 is approximately 650 feet below ground surface and Casino Well #2 is approximately 680 feet below ground surface. The general trends for wells with the same approximate water surface depth as the Casino production wells (between 510 and 721 feet below ground surface) are described following:

Rohnert Park Well #10: Located almost 2 miles east-southeast of the Resort. Monitoring starting in 2013 for this well shows general decreasing groundwater elevations that appear to correspond to wet/dry seasons. Average groundwater elevations vary between 20 and 110 feet above mean sea level between 2013 and 2016. Between 2016 and 2019 groundwater elevations averaged between 20 and 60 feet above mean sea level. Groundwater elevations were affected significantly going between 5 feet above mean sea level and 110 feet above mean sea level from late 2019 to early 2021. These high differentials in groundwater elevation are likely due to pumping at or approximate to this well for Rohnert Park.

Rohnert Park Well #24: Located adjacent to the Resort. Monitoring starting in 2010 for this well and remained relatively consistent in groundwater elevations between 30 and 60 feet above mean sea level. Groundwater elevations began to slightly trend downwards in 2016 ranging between 20 and 50 feet above mean sea level. Groundwater elevations began to be affected significantly between late 2019 to late 2021 and were measured between 15 feet above mean sea level and 65 feet above mean sea level. These high differentials in groundwater elevation are likely due to pumping at or approximate to this well for Rohnert Park.

Rohnert Park Well #41: Located approximately ¼-mile to the east of the Resort. Monitoring for this well began in 2010 with an upward trend in 2013 and has since been relatively stable between 40 and 60 feet above mean sea level with the exception of a few low average months in September 2015 and February 2018. Minor differentials in groundwater elevation are likely due to pumping at or approximate to this well for Rohnert Park.

In general, the three wells at similar depths to Casino Wells' #1 and #2 appear to be relatively stable with decreasing trends post 2016 for Rohnert Park Wells' 10 and 24. Rohnert Park Wells 10 and 24 also experienced significant changes in groundwater elevation from late 2019 to early 2021, possibly related to COVID-19 impacts in groundwater pumping.

Shallow aquifer groundwater wells (between 35 and 133 feet below ground surface) were also assessed (Laguna Monitoring Well, Station Well #1, Bridge Well, Larsen Well, CDFG Arlington Well). The following trends were observed since 2013:

CDFG Arlington Well: Located within the resort limits. Groundwater elevations for this well were relatively consistent from 2013 to 2019 with groundwater elevations between 35 and 40 feet above mean sea level. Data since winter of 2019 shows decreasing trends towards 27 feet above mean sea level in December of 2021.

Station Well #1: Located adjacent to the resort. Relatively consistent groundwater elevations occurred for this well between 65 feet above mean sea level and 75 feet above mean sea level. Decreasing trends since winter of 2019, trending towards 58 above mean sea level.

Laguna Monitoring Well: Located within the Resort limits. Relatively consistent groundwater elevations between 62 and 67 feet above mean sea level were measured for this well.

Bridge Well: Located within resort limits. Relatively consistent groundwater elevations between 65 feet above mean sea level and 75 feet above mean sea level for this well with the exception of a few months of significantly higher groundwater elevation (approximately 80 feet above mean sea level in winter 2017, winter 2018, and November 2020). Decreasing trends since winter of 2019, trending towards 58 above mean sea level.

Larsen Well: Located approximately 2 miles southwest of the Resort. Groundwater monitoring began in 2013 for this well and was relatively consistent from 2013 to 2019 with groundwater elevations relatively between 97 and 106 feet above mean sea level. Data since winter of 2019 shows decreasing trends towards 94 feet above mean sea level in December of 2021.

In general, shallow groundwater monitoring shows relatively stable groundwater elevations in the aquifer with a minor decreasing trend as of late 2019.

Deeper wells within the vicinity of the Site exhibited the following trends:

RP Well #15: Located approximately ¾-mile east of the Resort. Groundwater monitoring began in 2010. Average groundwater levels for this well vary between 34 and 67 feet above mean sea level with the exception of 96 feet above mean sea level in March 2013, 97 feet above mean sea level in April 2016, and 8 feet above mean sea level in September 2016. Groundwater levels began to trend downwards between 20 and 60 feet above mean sea level after spring 2016. This well may be strongly influenced by pumping for Rohnert Park, contributing to significant differences in groundwater elevation.

Poncia Well #1: Located approximately 1 mile to the west of the Resort. Groundwater monitoring for this well began in 2013 and maintained relatively consistent average groundwater levels with fluctuations typically between 60 and 70 feet above mean sea level. Average groundwater levels began to steadily decrease in February of 2019 and have trended downward around 50 feet above mean sea level.

Poncia Well #2: Located approximately ½-mile to the west of the Resort. Groundwater monitoring began for this well in 2013 and maintained relatively consistent average groundwater levels with fluctuations typically between 60 and 70 feet above mean sea level. Average groundwater levels began to steadily decrease in February of 2019 and have trended downward around 50 feet above mean sea level.

In general, deep groundwater wells in the vicinity of the Resort appear to be decreasing in measured groundwater elevations since 2019. Minor fluctuations appear to correspond to pumping.

In general, wells show a correlation between their groundwater elevations and groundwater extraction in the Resort's wells but changes in groundwater elevation appear to be minimal for shallow wells. A more significant correlation was observed for deeper wells with an overall decreasing trend beginning in 2019. Prior to 2019, average groundwater elevations were relatively stable. Overall fluctuations in wells were similar to pre-project conditions before beginning to trend downwards after 2019. Rohnert Park municipal wells show more variability in groundwater elevations due to pumping in or near these wells.

7.2.2 Groundwater Quality

Groundwater quality is variable throughout the subbasin, however, is generally acceptable for beneficial uses. Constituents of concern are considered on a local basis and include specific conductance, chloride, TDS, nitrate, and arsenic. These constituents have exceeded state- or federal-recommended or mandatory regulatory standards for drinking water from well samples. Naturally occurring constituents of concern have been identified as arsenic, boron, TDS, and chloride.

The Graton Rancheria wells (Casino Well #1 and Casino Well #2) were sampled in 2012 and 2013 and reported exceedances of secondary maximum contaminant levels (MCLs) for aluminum, iron, and manganese. Groundwater is treated for potable use onsite.

7.2.3 Santa Rosa Plain Sub-Basin Water Balances

The following water balance is summarized from the Santa Rosa Plain Sub-Basin Groundwater Sustainability Plan (SRPGSA, 2021):

The groundwater storage capacity of the Santa Rosa Plain Sub-Basin has been estimated to be approximately 4,313,000 ac-ft. (DWR, 2004). The main sources of recharge to the Santa Rosa Plain Sub-Basin are direct infiltration of precipitation (approximately 25,200 AFY) and infiltration from streams (approximately 14,900 AFY). Minor sources of recharge include infiltration from septic tanks (approximately 1,200 AFY) in addition to leaking water-supply pipes, leaking storm drain pipes, irrigation water in excess of crop requirements, and crop frost protection applications. The shallow aquifer receives most of this recharge, and recharge that reaches the deeper aquifer zones is less well-defined and appears to come from a combination of leakage from overlying shallow aquifers and mountain-front recharge along margins of the valley.

The majority of groundwater inflow into the Santa Rosa Plain Sub-Basin is percolation of surface water from precipitation as well as percolation from applied agricultural irrigation water, streambed recharge, and subsurface inflow from neighboring subbasins. Together these inflows contribute 95 percent of total groundwater inflow. The largest inflow is deep percolation of precipitation and applied irrigation water and the next largest inflow is stream recharge for the historical and current time period. In general, the historical and current inflows are similar; however, current deep percolation is about 88 percent of the historical average value, reflecting the lower average precipitation in the current period.

Groundwater discharge primarily occurs through groundwater discharge to streams (approximately 13,700 AFY), groundwater pumping (approximately 19,900 AFY), and evapotranspiration and surface leakage of groundwater (approximately 14,700 AFY).

Groundwater pumping is the biggest stress (municipal and industrial users and rural domestic and agricultural users) followed by discharge to streams for the historical and current time periods. Evapotranspiration from groundwater to the surface soil zone are also substantial outflows.

Historically, (1976-2018), average losses estimates of 600 AFY occurred. Currently, average losses are estimated at 2,100 AFY. The average annual results indicate that about 3 percent of pumpage in the basin contributes to groundwater-storage depletion. The increased rate of groundwater-storage depletion during the recent period (WY 2012 through WY 2018) was found to be more a result of a drier climate than increased groundwater pumping during that period.

For the full projected period from 2021 through 2070, the simulated average loss of groundwater in storage decreases to 1,400 AFY. This includes an extended drought beginning in 2050. Between 2021 and 2040, estimated losses are projected at 200 AFY reflecting a wet and very wet climate change scenario.

Historically, on average, approximately 19,600 AFY of groundwater has been pumped from the basin annually. Currently (2012 to 2018), on average, approximately, 20,300 AFY of water is pumped from the basin. For water years 2021 through 2070, The GSP projects that approximately 26,100 AFY will be pumped from the basin. This additional pumping demand was estimated based on a combination of historical and potential future uses. The projections included higher-end ranges for GSP planning that are generally higher in comparison than planning projections for Urban Water Management Plans (UWMPs). The GSP projection also accounts for population growth and associated groundwater demands. For the WY 2021 to 2040 period, rural domestic pumpage is estimated to be similar to the current period. Rural domestic pumpage is projected to increase over the 50-year projection period. Municipal pumpage is estimated to increase by 1,400 AFY for the 2021 through 2040 period. Lastly agricultural pumpage is estimated to increase 2,200 AFY, as compared to the current period due to crop expansion and to account for the impact of climate change on cropland sustainability. Cumulatively, the GSP estimates an increase of total groundwater pumpage by 3,600 AFY in the basin by 2040representing an 18 percent increase in pumpage as compared to the current period. Municipal water demand is projected to increase by 31 percent (2,200 AFY) for the 2021 to 2040 period, and rural domestic demand is estimated to increase by 10 percent (300 AFY). A comparison of the historical water budget and current water budget shows greater stress on the subbasin in the current period than historically on average.

A summary as provided by the GSP analysis of subsidence is as follows (SRPGSA, 2021). The sub-basin has experienced fluctuations in minor land surface subsidence, with land-surface elevations declining at a rate of 0.2-inches per year from 1992 to 2001 and uplifting or rebounding 0.2-inches per year from 2003 to 2019. This relatively coincides with significant groundwater pumping and a subsequent reduction in groundwater pumping. The subsequent rebound of land surface following the reduction in groundwater pumping and recovery of groundwater levels provides evidence that the relatively minor historical land-surface subsidence in this area represents elastic land-surface subsidence, which has not caused permanent (or inelastic) collapse of fine-grained units within the aquifer system.

7.3 GROUNDWATER SUPPLY FEASIBILITY EVALUATION

The Santa Rosa Plain Sub-Basin has been classified by California Department of Water Resources (DWR) as a medium-priority basin. The results of the water budget performed as part of the Santa Rosa Plain Subbasin Groundwater Sustainability Plan indicated a loss of groundwater storage of about 2,100 AFY during the modeled period (2012-2018). A loss of 1,400 AFY is projected for the 2021-2070 period (SRPGSA, 2021).

The Rancheria currently supplies water solely from two groundwater production wells located on the Rancheria within the middle of the southern end of the Santa Rosa Plain Sub-basin. The two wells have estimated yields of 400 gpm and 500 gpm. The estimated water demand for this expansion is within these yields, for each well independently.

The resort currently has two water distribution systems, one for potable and one for recycled water. Both currently use potable water from the on-site wells.

Groundwater from the two production wells has been sampled and analyzed for analytes related to drinking water quality. Groundwater is treated for potable use onsite and has been since 2013.

7.3.1 Projected Water Demand

Table 7-1 summarizes the total existing and projected water demand for the Resort with the proposed expansion:

Table 7-1 Future Resort Demands

Description	Annual Average		Max Month	
	gpd	gpm	gpd	gpm
Existing Facilities Water Demands (2017-2019)				
Well 1+ 2 Flow	183,900	128	241,400	168
Recycled water 2 pump station & irrigation pump station flow	123,900	86	181,100	126
Sewer	132,400	92	152,100	106
Expansion Water Demands (Projected)				
Water Demand	153,900	107	177,500	123
Recycled water pump station + irrigation pump station flow	90,100	63	103,500	72
Total Projected Demand (Existing + Expansion)				
Water Demand	337,800	235	418,900	291
Recycled water pump station + irrigation pump station flow	214,000	149	284,600	198

Based on the Well Completion Reports (Appendix B), Casino Well #1 and Casino Well #2 have estimated yields of 500 gpm and 400 gpm, respectively. Either well can accommodate the proposed expansion water demand independently. However, the average projected water demand exceeds the 200 gpm production originally targeted.

The recycled water distribution system currently uses potable water from the wells. The total average potable water demands for the future expansion would be reduced to the originally targeted withdrawal rate of 200 gpm or less by obtaining at least 35 gpm of the recycled water demands from a non-well water source. If all recycled water demands were satisfied by non-well water sources, then the total combined average well production would be lower than the current annual average.

Table 7-2 below illustrates the total current and projected groundwater pumping rates from the Santa Rosa Plain Subbasin and the current and projected pumping rates for the Resort and Rohnert Park and compares their relative contributions to the overall sub-basin withdrawals.

Table 7-2 Annual Average Groundwater Pumping Rates

Description	Annual Average, acre-feet per year (AFY)	Percentage of Total Basin Pumping	Percentage of Rohnert Park Pumping
Current SRP Sub-Basin[1]	20,300	--	--
Projected SRP Sub-Basin (WY 2021 to WY 2070)[1]	26,200	--	--
Rohnert Park Current	2,577	12.7%	--
Rohnert Park Projected (2045)	2,577	9.8%	--
Existing Graton Rancheria[2]	207	1.0%	8.0%
Projected Graton Rancheria (no recycling)	379	1.5%	14.7%

1 Santa Rosa Plain Sustainability Plan
2 Annual average (2018)

The existing and proposed groundwater pumping for the Graton Rancheria Resort was compared against the current and projected pumping scenarios for the Santa Rosa Sub-Basin to assess the percentage of impact to the entire groundwater basin from the project. As shown in Table 7-2, groundwater impacts to the basin are estimated as 1.0% for the existing pumping scenario, and 1.5% for the projected pumping scenario as a percentage of total groundwater pumped from the Sub-Basin. Groundwater pumped from the Sub-Basin in Rohnert Park is approximately 12.7% of the total currently. Graton Rancheria currently contributes 8.0% of the total pumped from Rohnert Park and under the project scenario without a separate recycled water source, the Rancheria's contribution would increase to 14.7% of Rohnert Park's pumped total.

7.3.2 Potential Impacts

The initial EIS prepared for the resort included a Groundwater Study (Worley, 2007) which analyzed the impacts to groundwater using a sustained pumping rate of 200 gpm. The Record of Decision associated with the EIS also provided mitigation measures related to groundwater impacts assuming a sustained 200 gpm flow rate. Those mitigation measures may still be appropriate, however, since that time, additional information has been collected regarding the wells surrounding the Graton Rancheria Resort:

In general, the three Rohnert Park wells at similar depths to Casino Wells' #1 and #2, and within a 2-mile vicinity of the Resort, appear to be relatively stable with decreasing trends post 2016. Rohnert Park Wells 10 and 24 experienced significant changes in groundwater elevation from late 2019 to early 2021, possibly related to drought conditions. Shallow aquifer groundwater monitoring in a 2-mile vicinity of the project indicates relatively stable groundwater elevations in the aquifer with a minor decreasing trend as of late 2019. Other deep aquifer groundwater wells appear to be decreasing in groundwater elevation since 2019. Minor fluctuations appear to correspond to pumping in the deep aquifer.

In summary, the local area wells show a correlation between their groundwater elevations and groundwater extraction in the Resort's wells but changes in groundwater elevation appear to be minimal for shallow wells. A more significant correlation was observed for deeper wells with an overall decreasing trend beginning in 2019. Prior to 2019, average groundwater elevations were relatively stable. Decreasing groundwater trends observed in shallow and deep aquifers may be occurring due to drought conditions after 2019. The deep aquifer in the vicinity of the Resort appears to be more significantly impacted by groundwater pumping by Rohnert Park.

Additional pumping of wells to meet the projected 84 percent water demand increase of the proposed expansion may contribute to additional impacts to groundwater levels. An increased radius of influence caused by additional pumping would be expected to potentially have an effect on nearby wells in the immediate vicinity of the Resort, potentially decreasing their ability to extract groundwater.

The cumulative projected average daily water demand initially assessed for the Resort was 200 gpm. With the proposed expansion, and no additional recycled water source, the water demand is projected to increase to an average daily demand of 235 gpm.

7.3.3 Potential Mitigation Measures

The following mitigation measures may be considered to address potential groundwater impacts:

- Reduce water demand through installation of Energy Star rated low-flow fixtures for bathroom faucets in the expansion area.
- Initiate recycled water use at the Resort to partially or fully offset increased groundwater use due to the proposed expansion.
- Provide recharge of the groundwater basin through use of leach fields or other underground injection methods. Additional geotechnical studies would be required to estimate feasibility of recharge systems given the anticipated low permeability of on-site soils.
- Continue implementation of the Groundwater Monitoring Program.

The Resort may consider the following options for additional recycled water to offset water demand. This would be used for facilities suitable and set up for distribution of recycled water use (i.e. irrigation and toilets). Additional storage and pumping may be required depending on the amount of recycled water used.

1) Laguna Wastewater Treatment Plant Source: This option would be connecting to the Laguna WWTP supply. Currently, this supply serves recycled water to parcels in the region of the Rancheria. It is our understanding quantity is limited and may be difficult to obtain.

Onsite Recycled Reuse: Construct an on-site wastewater treatment facility to treat the Resort's waste stream. Treatment would need to be equivalent to California Title 22 standards for tertiary effluent to be reused at the Resort.

7.3.4 Thresholds of Significance and Impacts

According to the significance criteria from the "Off-Reservation Environmental Impact Analysis Checklist" of the Tribe's Tribal State Compact, the proposed project may have a significant impact on water resources if it would substantially deplete off-reservation groundwater supplies or interfere substantially with groundwater recharge such that there should be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

Consistent with the EIS, the proposed project could deplete off-reservation groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or lowering of the local groundwater table.

7.3.5 Mitigative Alternatives Analysis

To mitigate for potentially significant impacts related to water resources, the following mitigation measures were proposed in the EIS: water saving fixtures, well monitoring, and implementing reclaimed water alternatives including connecting the Resort to one of the reclaimed pipelines from the Laguna WWTP and currently in streets adjacent to the Reservation or installing a small pre-manufactured wastewater treatment facility for generating recycled water. Table 7-3 below describes the impacts for the following recycled water alternatives.

The following alternatives have been proposed for onsite recycled reuse as discussed in Section 6.0:

Table 7-3 Recycled Water Offset Alternatives

Alternative	Total Projected Well Water Demand		Impacts
	GPY	gpm	
No Recycled Water	123,285,000	235	Significant
Alternative 1 – WWTP Sized to Minimize RW Flows	71,074,000	135	Less than Significant
Alternative 2A – Sized to Maximize Demands + Potable Supplement	47,336,000	90	Less than Significant
Alternative 2B – Sized for Maximum Sewer Flow & Storage & Recharge	45,183,000	86	Less than Significant
Alternative 3A – Sized to Maximize Sewer Flow & Potable Supplement & Recharge	47,336,000	90	Less than Significant
Alternative 3B – Sized for Maximum Sewer Flow & Storage & Recharge	45,183,000	86	Less than Significant
Connection to Laguna WWTP	Projections and impacts depend on availability of recycled water from Laguna WWTP. If total project potable water demand is reduced to less than 200 gpm, impacts may be less than significant.		

Without reuse of recycled water, significant impacts to the basin above the thresholds initially studied as part of the EIS would be expected and mitigation to off-set these impacts would be recommended. However, with either of the recycled water alternatives, impacts to groundwater resources in the Sub-Basin would be reduced to less-than-significant levels depending on the amount of recycled water used at the Resort to displace current potable water consumption.

7.3.6 Summary of Major Evaluation Findings

A summary of the key findings is provided below:

- The GSP indicates there is an average project groundwater loss of 1,400 acre-foot per year (AFY) in the Santa Rosa Plain Sub-Basin. Sustainable management criteria primarily consist of maintaining groundwater levels near historical observed ranges while accounting for drought and climate variability.
- The projected cumulative water demand (235 gallons per minute (gpm)) is within the existing production well yields (500 gpm, and 400 gpm for Casino Well #1 and #2, respectively). Each well could independently produce enough water to meet the projected water demand.
- The projected cumulative water demand (235 gpm), without a recycled groundwater component exceeds the 200 gpm flow rate evaluated in the initial EIS, and for which mitigation measures have been prescribed.
- Shallow aquifer groundwater levels in the vicinity of the Resort appear to be relatively stable and don't appear to fluctuate significantly with groundwater pumping. Deep aquifer groundwater levels in the vicinity of the Resort appear to correspond to pumping from the Resort and/or Rohnert Park. Shallow and deep groundwater has experienced a slight decline in elevation since 2019. This may be more impacted from the recent drought than groundwater pumping.
- Additional pumping of wells to meet the projected 46 percent water demand increase of the proposed expansion may contribute to additional impacts to groundwater levels. An increased radius of influence would be expected and potentially have a negative effect on nearby wells in the immediate vicinity of the Resort.
- The Resort currently pumps 1.0% of total pumping from the Santa Rosa Plain Sub-Basin. With the proposed expansion, pumping from the Resort would be approximately 1.5% of total groundwater pumping without recycled water reuse.
- The use of recycled water, either through purchasing of external sources, or through on-site wastewater treatment, would reduce impacts to the groundwater basin to be less than the 200 gpm well demand targeted within the original EIS.

8. ALTERNATIVES DISCUSSION AND CONCLUSIONS

The initial EIS prepared for the Resort included a groundwater study that analyzed impacts of groundwater use with a sustained pumping rate of 200 gpm. The Record of Decision associated with the original EIS provided mitigation measures related to groundwater use impacts assuming a sustained 200 gpm pumping rate. Therefore, the previously established target for sustained pumping at 200 gpm was again considered the upper limit for the current project.

The water demand for the Resort due to the planned expansion is projected to increase the average daily sustained pumping rate to 235 gpm. To be consistent with mitigations of the EIS, the Resort would need to reduce groundwater pumping demand by at least 35 gpm. Additionally, since the time when the Record of Decision was rendered, results of the water budget performed as part of the Santa Rosa Plain Subbasin Groundwater Sustainability Plan indicated a loss of groundwater storage of about 2,100 AFY (from 2012-2018) and projected a continuing loss of 1,400 AFY for the 2021-2070 period (SRPGSA, 2021). In other words, the groundwater basin is currently being overdrawn. Therefore, holding the current 200 gpm goal, or less, is recommended given the recent findings of the SRPGSA. The findings of that study would suggest that any increase over the existing uses could be considered significant to the overall groundwater basin.

Use of recycled water should be given the highest priority for reducing potential impacts to groundwater resources. The potential alternatives for offsetting a minimum of 35 gpm include the use of recycled water from two potential sources: purchase recycled water from the Subregional system's distribution system or construct onsite wastewater treatment and use the effluent as the recycled water source.

The alternatives discussed previously are summarized and ranked as:

1. Utilize recycled water purchased from Rohnert Park/Subregional System to offset a minimum equivalent of 35 gpm of well yield and ensure ground water withdrawal is limited to a sustained 200 gpm or less. This solution requires the least amount of necessary infrastructure and would have the lowest on-going operation and maintenance costs.

   Additionally, recycled water for non-potable uses is consistent with local, regional and state-wide water conservation efforts. However, it is not known whether Rohnert Park would be able to obtain a sufficient supply of recycled water from the LTP to serve the Resort.

   It may be that only the new facilities constructed with the expansion project would be able to utilize recycled water. The current recycled water system reportedly does not meet the Subregional System's standards, however, all new facilities could be constructed to the appropriate standards.

2. Utilize recycled water purchased from Rohnert Park/Subregional System to offset groundwater use during the off-season when other recycled water uses (typically irrigation uses) are generally very low. Recycled water use is lowest during the period of mid-October to mid-April and that reduced demand period may offer an opportunity to increase Resort recycled water use, thereby curtailing the potable water being used currently during this time period. This alternative may be more feasible since recycled water should be readily available when recycled water demands on the whole system are their lowest.

   Total use of recycled water during the off-season period would need to average approximately 70 gpm to have an annual offset of 35 gpm. The projected recycled water demand during the low season would be sufficient to achieve this offset.

3. Implement a tertiary treatment system to produce recycled water to offset a minimum of 35 gpm of otherwise potable water demand. The lowest cost alternative analyzed is Alternative 1, which would offset considerably more than the minimum necessary. However, Alternative 2 would reduce demand on the ground water basin by approximately 33 percent over current uses. Alternative 3 would only be recommended if some groundwater recharge were desired. Both Alternatives 2 and 3 also have the option of adding storage to completely offset all potable water use; however, the cost and space requirements for the storage tank may not be justified.

   If recycled water from the subregional system could not be obtained, then the recommended action would be to construct onsite wastewater treatment facilities per alternative 1 to offset most new water demands or alternative 2a which would satisfy nearly all recycled water demands with minimal potable supplement.

In addition to state-required low flow fixtures and water conservation principles, it is recommended that all new facilities, at a minimum, be plumbed to meet Title 22 to allow any recycled water purveyor to supply the facility with recycled water, as available. Provision of Title 22-compliant facilities would allow purveyors to supply recycled water in compliance with their existing operating permits and terms of recycled water agreements. While it is understood that Tribal facilities are not typically required to comply with state regulations, purveyors of recycled water are required to do so under conditions stipulated in their operating permits which include Title 22 compliance. Since recycled water user agreements are typically part of the operating permit, those conditions are also applicable to the end user. Compliance with Title 22 would increase the facility's long-term compatibility for use of recycled water produced off site.

9. SELECTED REFERENCES

Applied Engineering and Geology, Inc.; Evaluation of Water Supply and Wastewater Management Feasibility and Evaluation of Groundwater Supply Feasibility and Potential Off-Reservation Impacts to Water Quality and Resources; Graton Rancheria Hotel and Casino Expansion Project; November 16, 2016; Revised November 30, 2017.

National Oceanic and Atmospheric Administration National Weather Service; NOWData; https://www.weather.gov/wrh/Climate?wfo=mtr; July 11, 2022.

California, Department of Water Resources, Bulletin 118, Santa Rosa Valley, Santa Rosa Plain Subbasin, California's Groundwater Update, 2004, https://water.ca.gov/programs/groundwater-management/bulletin-118

California, Department of Water Resources (DWR), 1982, Evaluation of Ground Water Resources: Sonoma County, California Department of Water Resources Bulletin 118-4, Volume 3: Petaluma Valley

Knudsen, K.L., Sowers, J.M., Witter, R.C., Wentworth, C.M., Helley, E.J., 2000, Preliminary geologic maps of the Quaternary deposits and liquefaction susceptibility, nine-county San Francisco Bay Region, California: A digital database: U.S. Geological Survey Open-File Report 00-44, ver. 1.0, scale 1:52,500.

Wagner, D.L., and Gutierrez, C.I., 2017, Preliminary Geologic Map of the Napa and Bodega Bay 30' x 60' Quadrangles, California: California Geological Survey, Preliminary Geologic Maps , scale 1:100,000

Clahan, K.B., Bezore, S.P., Koehler, R.D., and Witter, R.C., 2003 Geologic map of the Cotati 7.5-minute quadrangle, Sonoma County, California: California Geological Survey, Preliminary Geologic Maps, scale 1:24,000

Groundwater Sustainability Plan, Sonoma Valley Groundwater Subbasin, Sonoma Valley Groundwater Sustainability Agency, 2021.Hecker, S, and Randolph Loar, C.E., 2018, Map of recently active traces of the Rodgers Creek Fault, Sonoma County, California: U.S. Geological Survey Scientific Investigations Map 3410, 7 p., 1 sheet, https://doi.org/10.3133/sim3410.

Hecker, S., Pantosti, D., Schwartz, D.P., Hamilton, J.C., Reidy, L.M., and Powers, T.J., 2005, The most recent large earthquake on the Rodgers Creek fault, San Francisco Bay area: Bulletin of the Seismological Society of America, v. 95, no. 3, p. 844–860, https://doi.org/10.1785/0120040134.

Watt, J., Ponce, D., Parsons, T., and Hart, P., 2016, Missing link between the Hayward and Rodgers Creek faults, Science Advances, v. 2, no. 10, doi:10.1126/sciadv.1601441

Santa Rosa Plain Groundwater Sustainability Agency (SRPGSA); Groundwater Sustainability Plan; December 2021.

Sweetkind, D.S., J.A. Hevesi, T. Nishikawa, P. Martin, and C.D. Farrar. 2013. "Hydrology of the Santa Rosa Plain Watershed, Sonoma County, California." Chapter B. In Nishikawa, Tracy, ed., Hydrogeologic and geochemical characterization of the Santa Rosa Plain watershed, Sonoma County, California. U.S. Geological Survey Scientific Investigations Report 2013-5118, pp. 27- 112.

Sweetkind, D.S., Taylor, E.M., McCable, C.A., Langenheim, V.E., and McLaughlin, R.J., 2010, Three-dimensional geologic modeling of the Santa Rosa Plain, California: Geosphere, v. 6, no. 3, p. 237–274.

U.S. Geologic Survey. Hydrologic and Geochemical Characterization of the Santa Rosa Plain Watershed, Sonoma County, California (Scientific Investigations Report 2013-5118) 2013.

Cardwell, G.T., 1958, Geology and ground water in the Santa Rosa and Petaluma areas, Sonoma County, California: U.S. Geological Survey Water-Supply Paper 1427, 273 p. and 5 plates.

Herbst, C.M., Jacinto, D.M., and McGuire, R.A., 1982, Evaluation of ground water resources, Sonoma County, volume 2: Santa Rosa Plain: California Department of Water Resources Bulletin 118-4, 107 p., 1 plate.

Hydroscience Engineers Inc.; Graton Rancheria Hotel and Casino Project Water and Wastewater Feasibility Study; November 2007.

Ford, R.S., 1975, Evaluation of ground water resources: Sonoma County, volume 1: geologic and hydrologic data: California Department of Water Resources Bulletin 118–4, 177 p., 1 plate.

Kadir, T.N. and McGuire, R.A., 1987, Santa Rosa Plain ground water model: California Department of Water Resources Central District, 318 p.

Allen, J.R., 2003, Stratigraphy and tectonics of Neogene strata, northern San Francisco Bay Area: San Jose, Calif., San Jose State University, unpublished Master's thesis, 183 p.

Holland, P., Rubin, R., Wakabayashi, J., and Allen, J., 2009, Geology along the Rodgers Creek and Tolay faults: Late Cenozoic stratigraphy and tectonics, Franciscan mélange and high grade metamorphism, and Quaternary landslide complexes: Association of Engineering Geologists, San Francisco Section Field Trip guide, August 2009, 42 p.

Swartz, R.J. and Hauge, Carl, 2003, California's groundwater: California Department of Water Resources Bulletin 118—Update 2003, 246 p

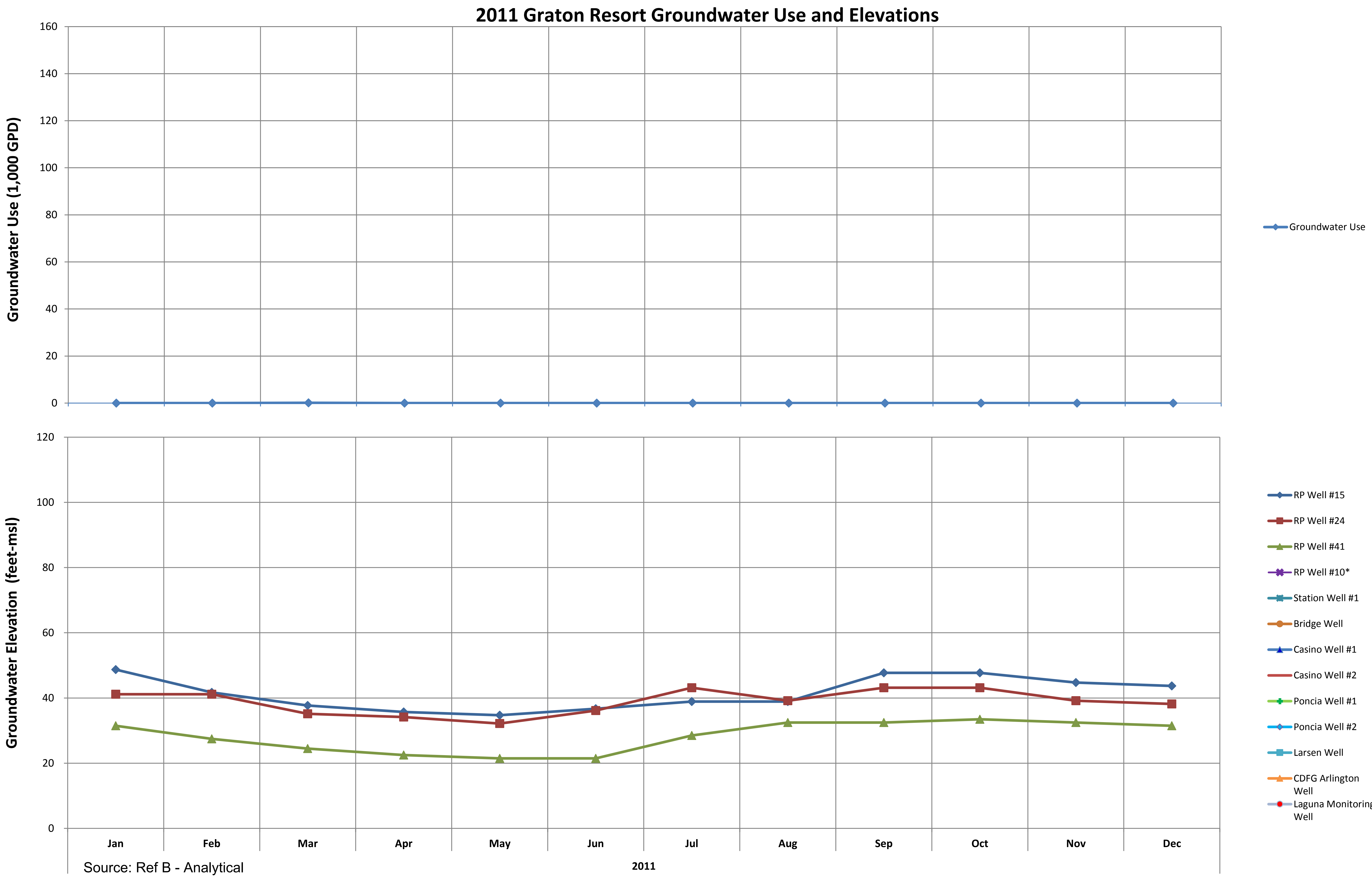
Kunkel, Fred, and Upson, J.E., 1960, Geology and ground water in Napa and Sonoma Valleys, Napa and Sonoma Counties, California: U.S. Geological Survey Water-Supply Paper 1495, 252 p.

WorleyParsons Komex. Groundwater Study: Proposed Graton Rancheria Casino and Hotel, Rohnert Park, California September 2007.

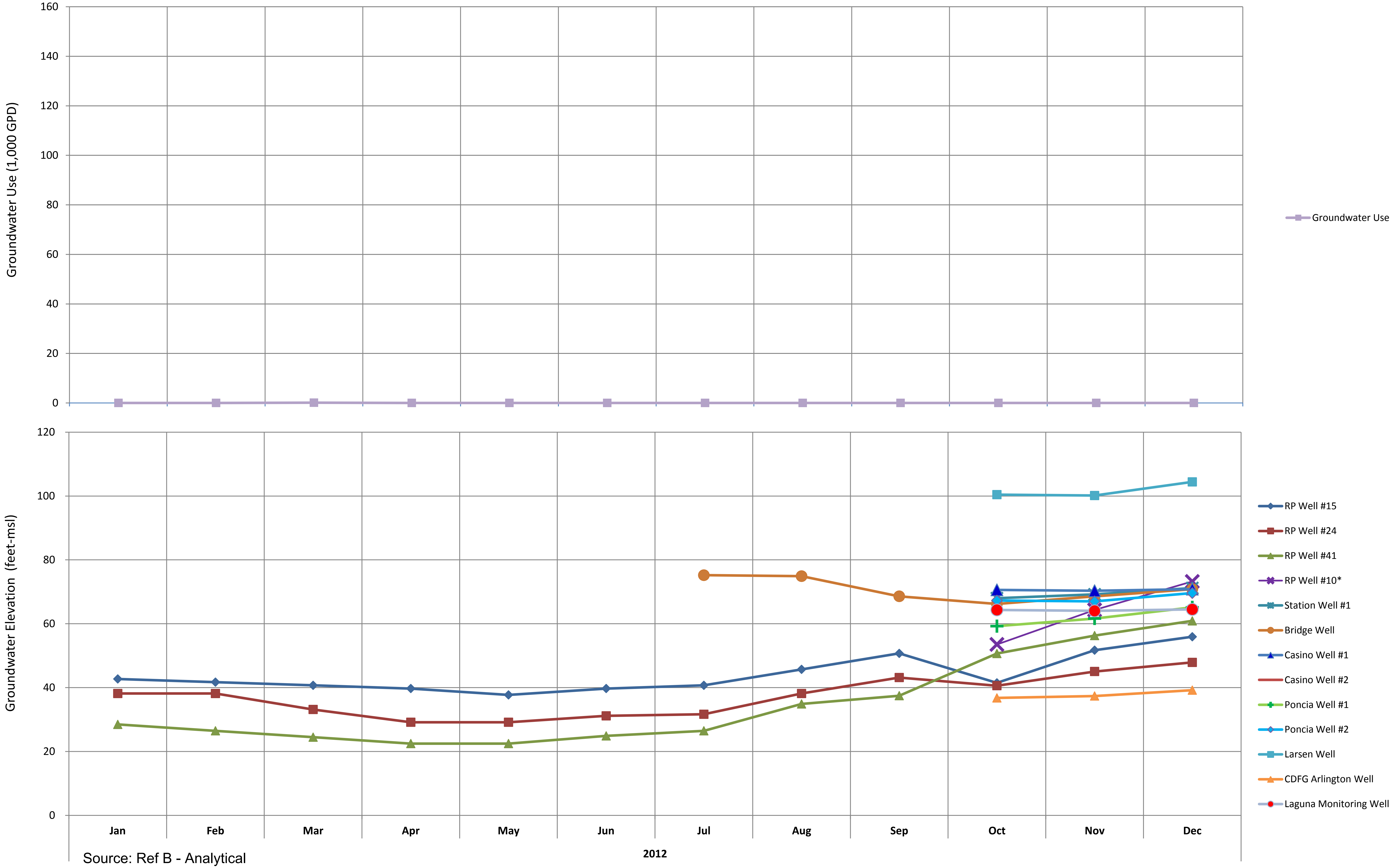
Appendix A - Groundwater Monitoring Data

2010 Graton Resort Groundwater Use and Elevations

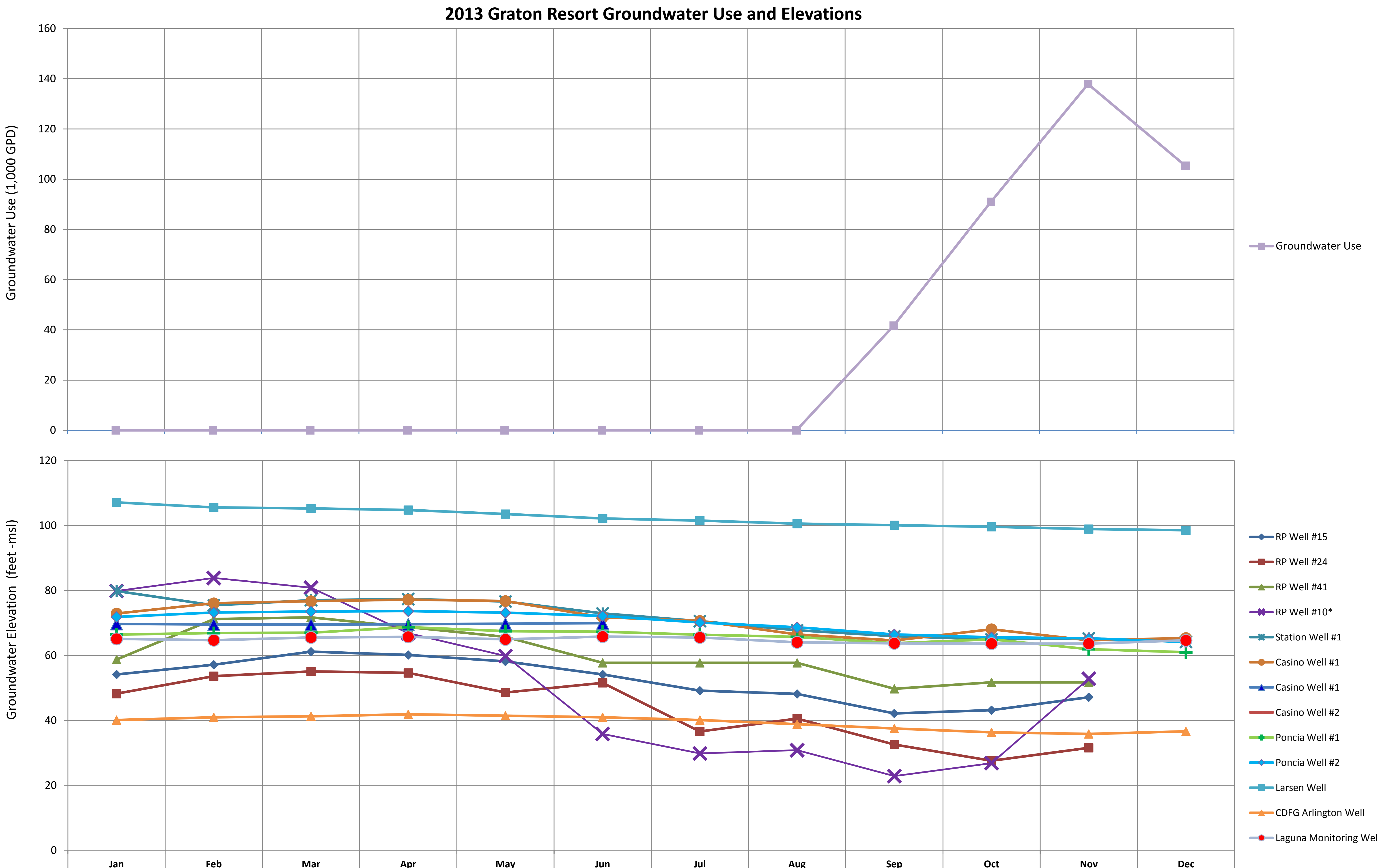
Source: Ref B - Analytical


2011 Graton Resort Groundwater Use and Elevations
Groundwater Use (1,000 GPD)
160
140
120
100
80
60
40
20
0
Groundwater Use
Groundwater Elevation (feet-msl)
120
100
80
60
40
20
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2011
RP Well #15
RP Well #24
RP Well #41
RP Well #10*
Station Well #1
Bridge Well
Casino Well #1
Casino Well #2
Poncia Well #1
Poncia Well #2
Larsen Well
CDFG Arlington Well
Laguna Monitoring Well
Source: Ref B - Analytical

2012 Graton Resort Groundwater Use and Elevations

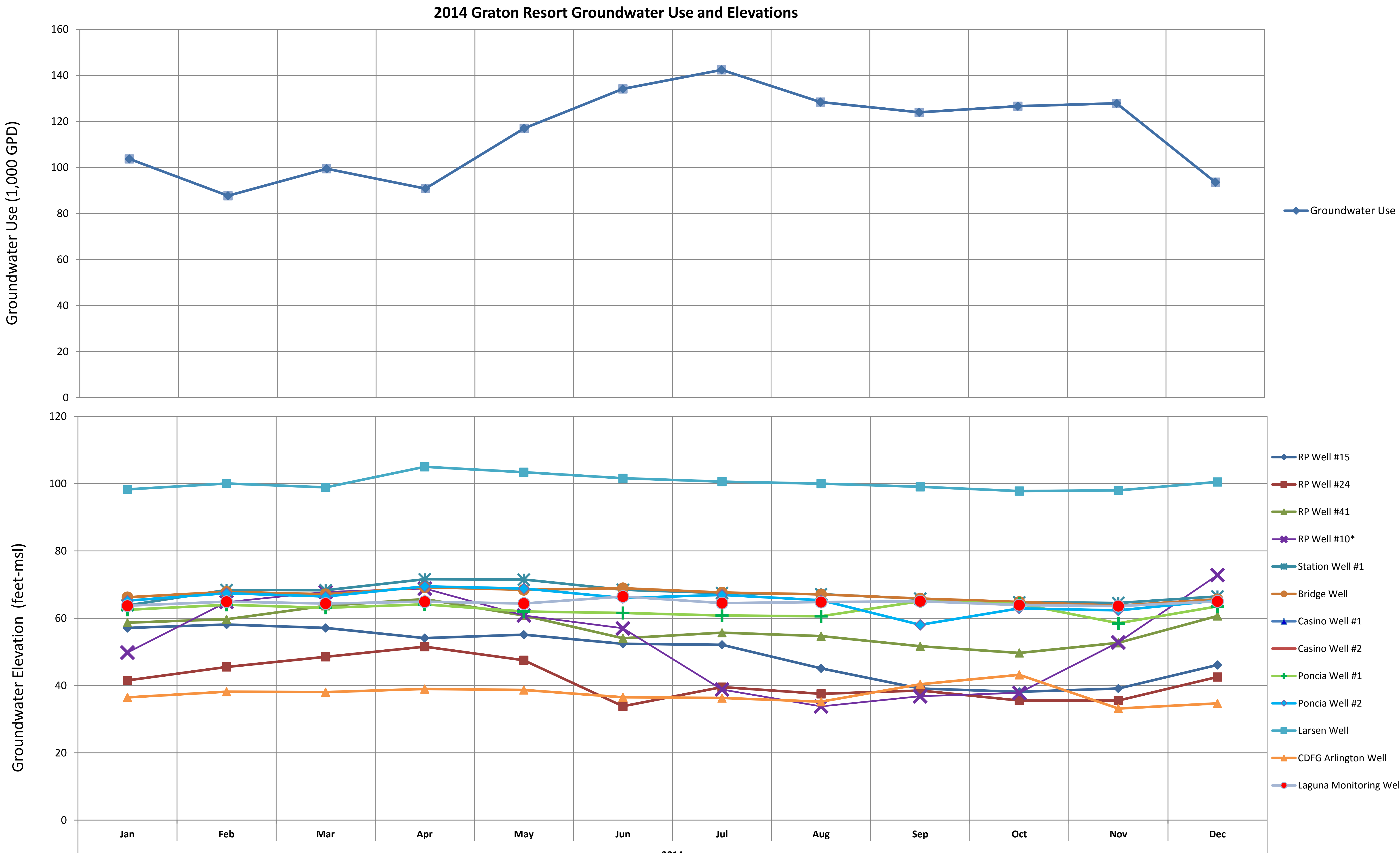


Source: Ref B - Analytical



Source: Ref B - Analytical

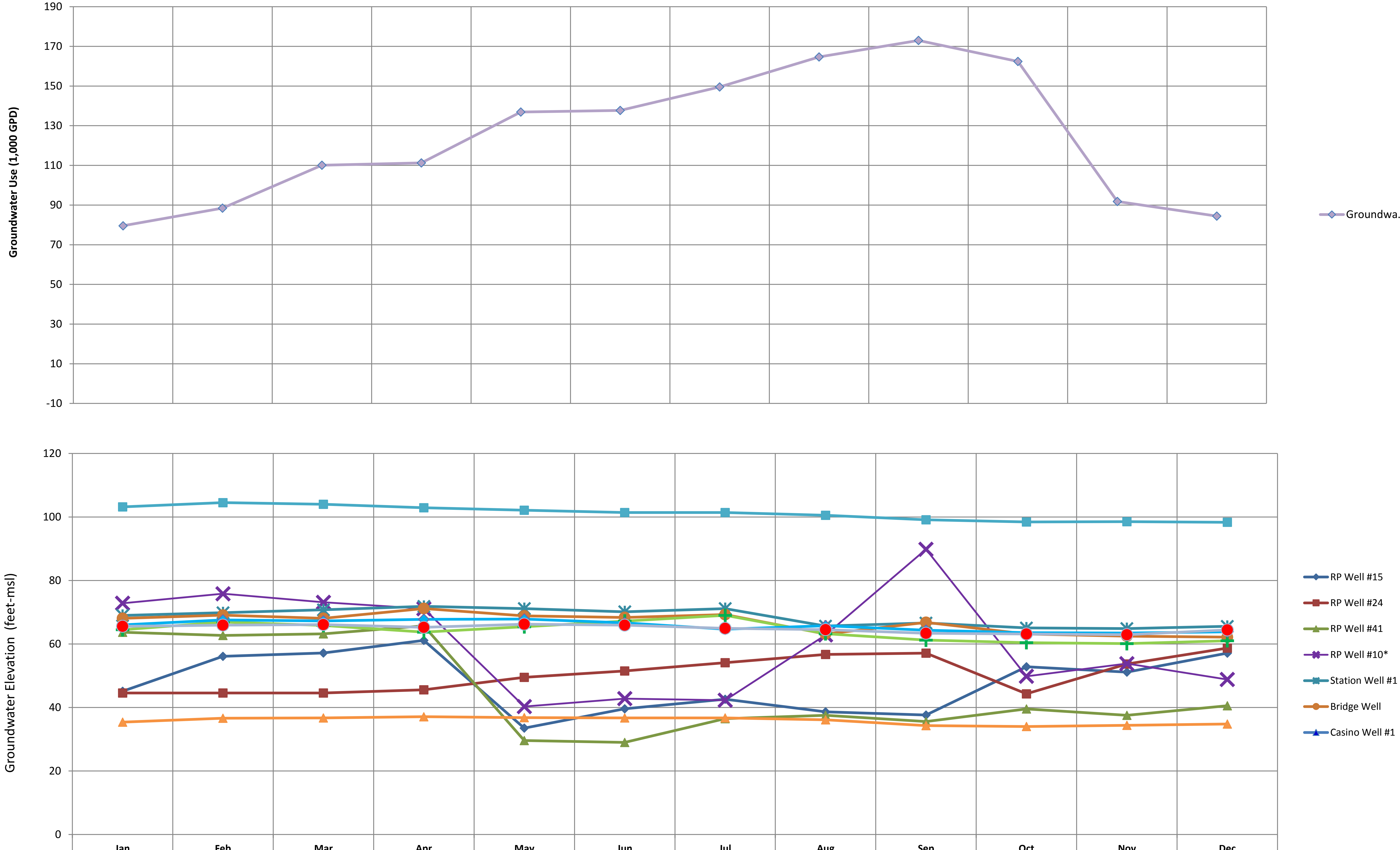
Notes:
* RP Well #10 was pumped by the City starting March 2013.



Source: Ref B - Analytical

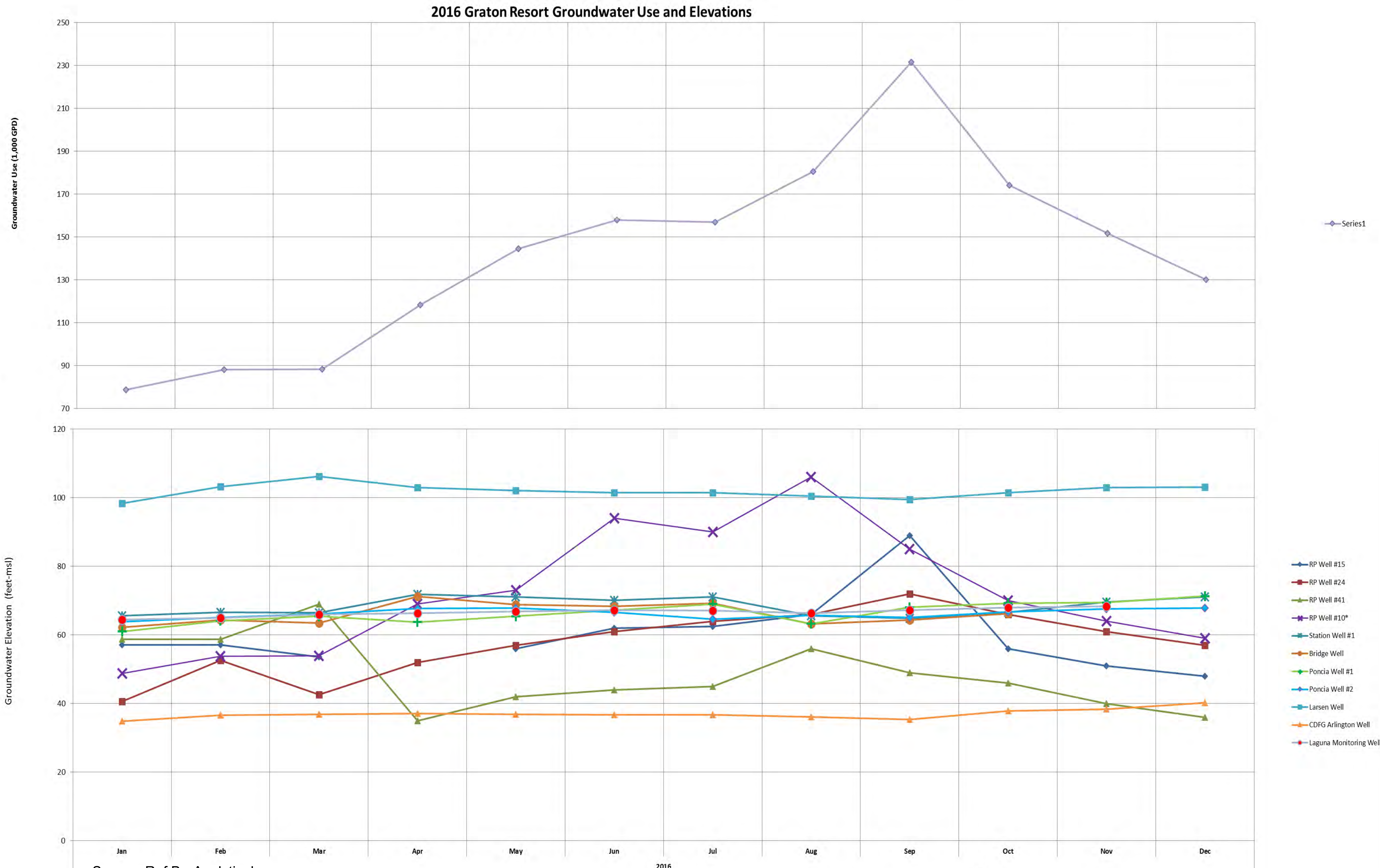
Notes:
* Datalogger currently installed.

2015 Graton Resort Groundwater Use and Elevations



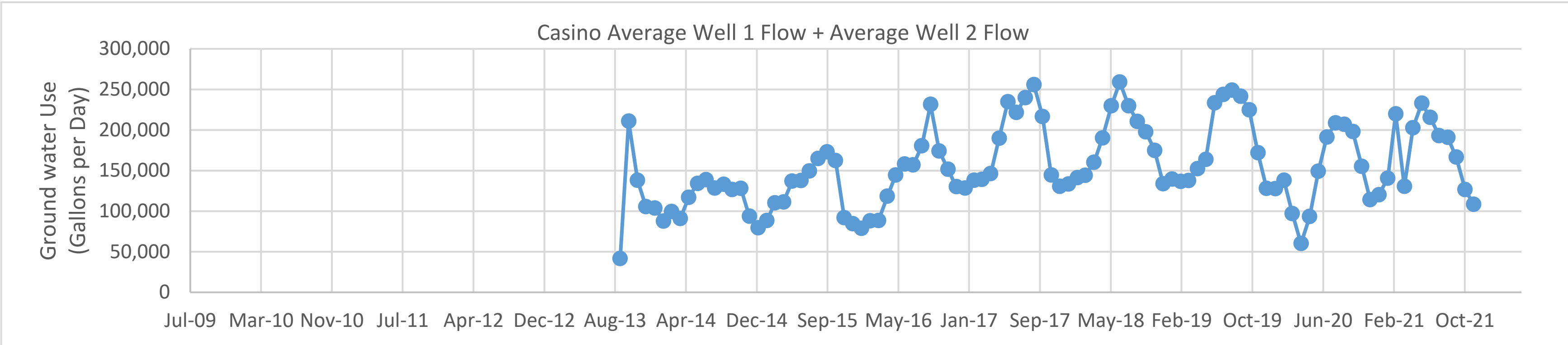
Source: Ref B - Analytical

Notes:
* Datalogger currently installed.

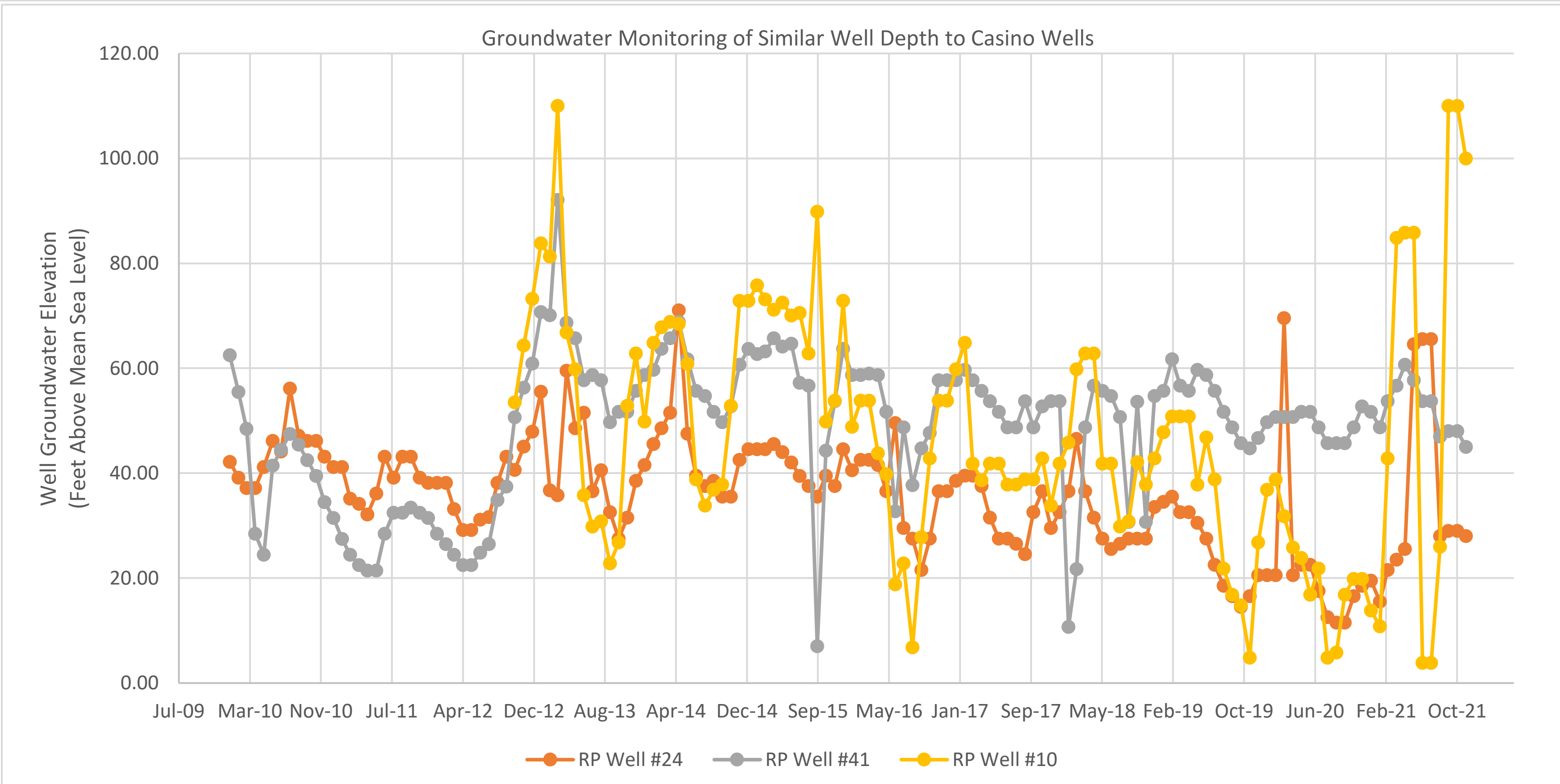


Source: Ref B - Analytical

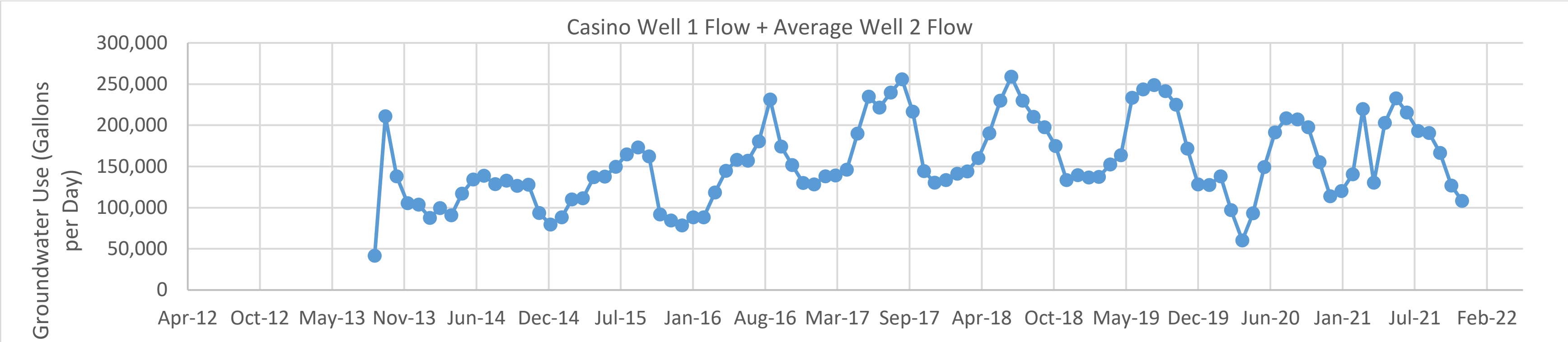
Notes:
* Datalogger currently installed.

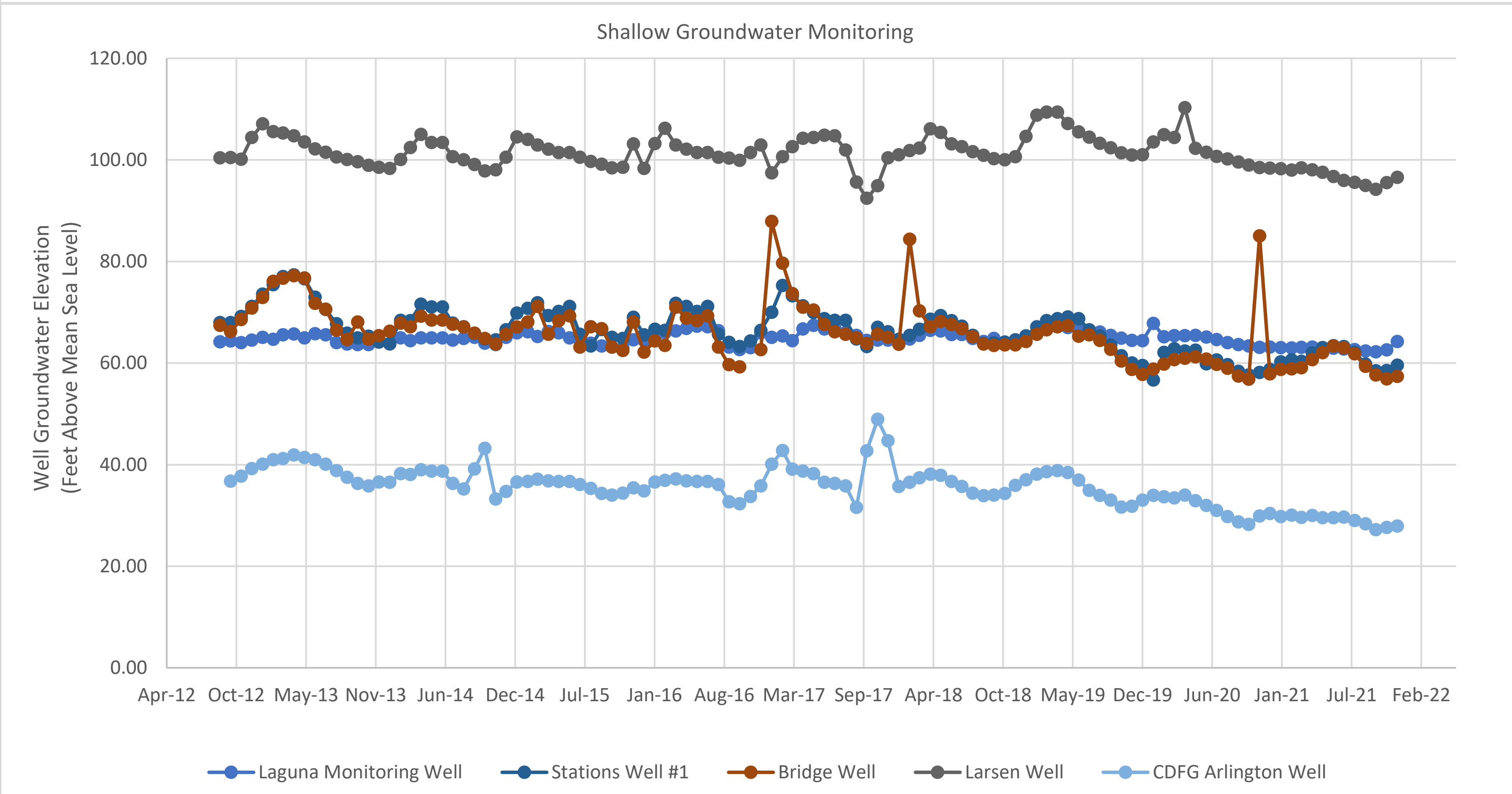


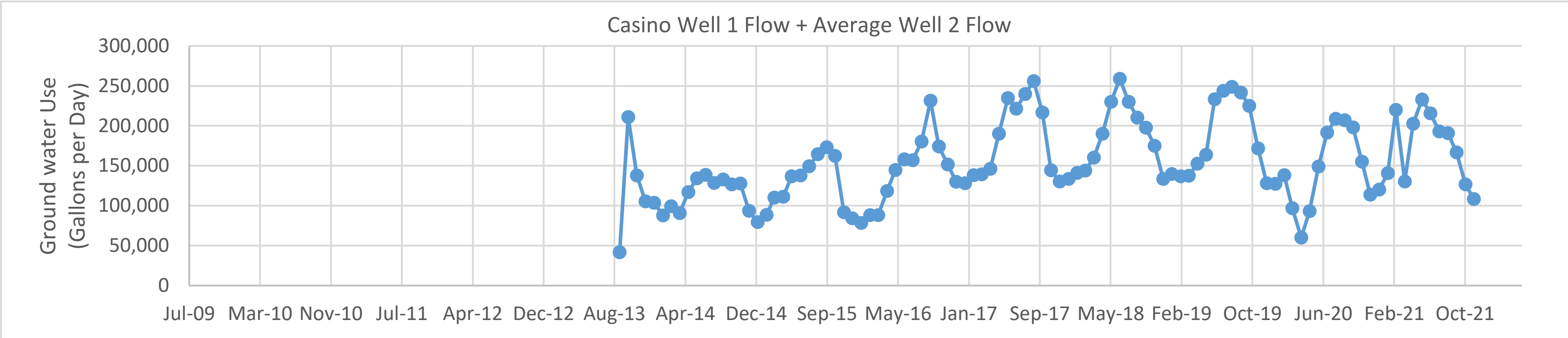
Casino Average Well 1 Flow + Average Well 2 Flow
Ground water Use
(Gallons per Day)
300,000
250,000
200,000
150,000
100,000
50,000
0
Jul-09 Mar-10 Nov-10 Jul-11 Apr-12 Dec-12 Aug-13 Apr-14 Dec-14 Sep-15 May-16 Jan-17 Sep-17 May-18 Feb-19 Oct-19 Jun-20 Feb-21 Oct-21



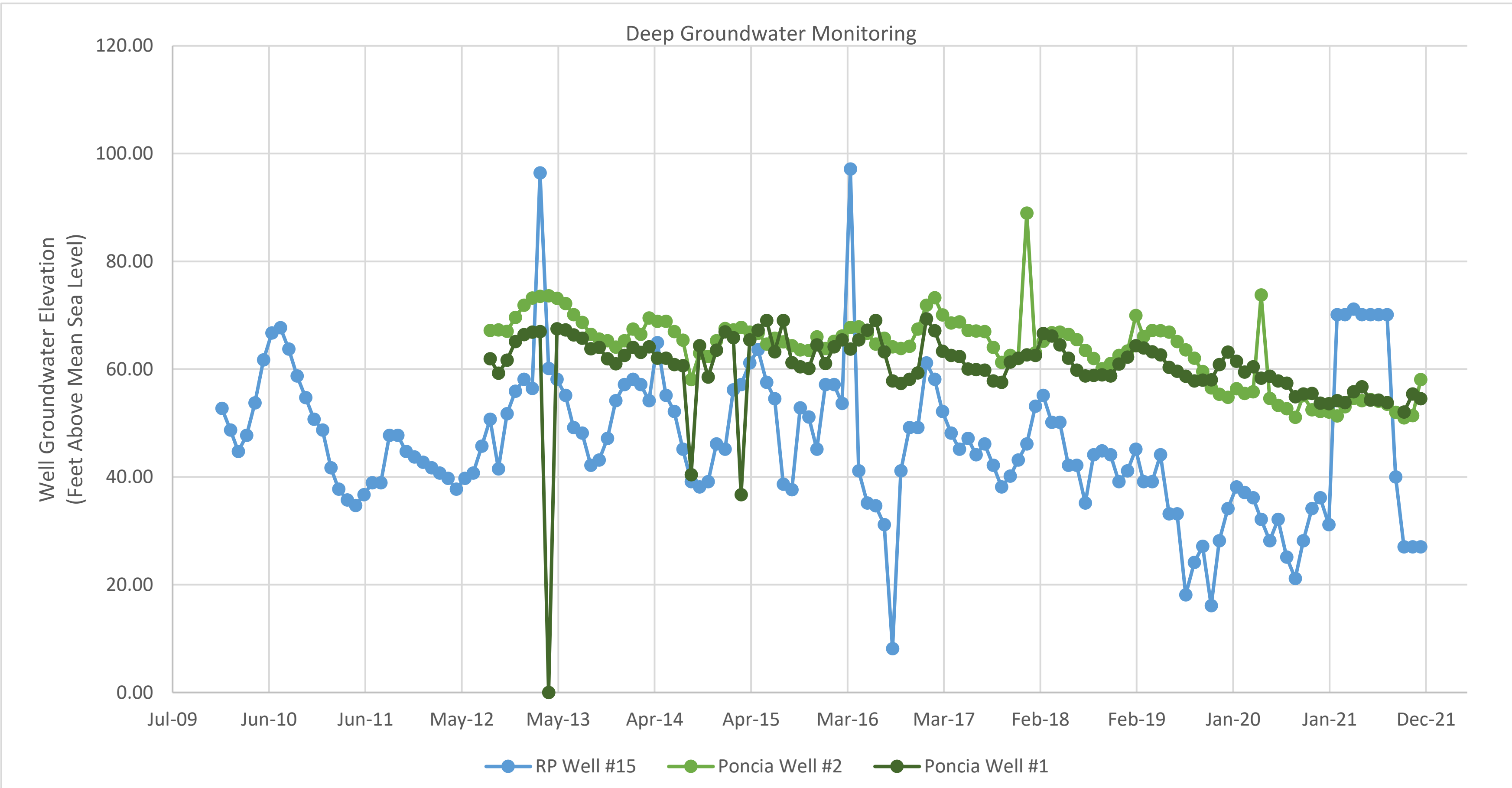
Groundwater Monitoring of Similar Well Depth to Casino Wells
Well Groundwater Elevation
(Feet Above Mean Sea Level)
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Jul-09 Mar-10 Nov-10 Jul-11 Apr-12 Dec-12 Aug-13 Apr-14 Dec-14 Sep-15 May-16 Jan-17 Sep-17 May-18 Feb-19 Oct-19 Jun-20 Feb-21 Oct-21
RP Well #24
RP Well #41
RP Well #10


Casino Well 1 Flow + Average Well 2 Flow
Groundwater Use (Gallons per Day)
300,000
250,000
200,000
150,000
100,000
50,000
0
Apr-12 Oct-12 May-13 Nov-13 Jun-14 Dec-14 Jul-15 Jan-16 Aug-16 Mar-17 Sep-17 Apr-18 Oct-18 May-19 Dec-19 Jun-20 Jan-21 Jul-21 Feb-22


Shallow Groundwater Monitoring
Well Groundwater Elevation (Feet Above Mean Sea Level)
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Apr-12 Oct-12 May-13 Nov-13 Jun-14 Dec-14 Jul-15 Jan-16 Aug-16 Mar-17 Sep-17 Apr-18 Oct-18 May-19 Dec-19 Jun-20 Jan-21 Jul-21 Feb-22
Laguna Monitoring Well
Stations Well #1
Bridge Well
Larsen Well
CDFG Arlington Well



Casino Well 1 Flow + Average Well 2 Flow
Ground water Use
(Gallons per Day)
300,000
250,000
200,000
150,000
100,000
50,000
0
Jul-09
Mar-10
Nov-10
Jul-11
Apr-12
Dec-12
Aug-13
Apr-14
Dec-14
Sep-15
May-16
Jan-17
Sep-17
May-18
Feb-19
Oct-19
Jun-20
Feb-21
Oct-21



Deep Groundwater Monitoring
Well Groundwater Elevation
(Feet Above Mean Sea Level)
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Jul-09
Jun-10
Jun-11
May-12
May-13
Apr-14
Apr-15
Mar-16
Mar-17
Feb-18
Feb-19
Jan-20
Jan-21
Dec-21
RP Well #15
Poncia Well #2
Poncia Well #1

Appendix B - Well Completion Reports

The Casino Backup Well

DWR

...is form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

Page 1 of 1

Owner's Well Number 80238-1

Date Work Began 07/07/2008 Date Work Ended 12/4/2008

Local Permit Agency County of Sonoma Permit & Resource Management Agency

Permit Number WEL08-0126 Permit Date 5/8/08

State of California
Well Completion Report

Refer to Instruction Pamphlet

No. e0083955

DWR Use Only – Do Not Fill In

06N08W22

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Reverse Circulation Rotary Drilling Fluid Fresh Water

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0	10	Top soil & clay
10	12	Sand & blue clay
12	52	Blue clay
52	62	Blue clay, sand & tan clay
62	72	Blue clay
72	112	Blue sandy clay
112	132	Gravel & blue clay
132	152	blue & tan sandy clay
152	172	Tan sandy clay & gravel
172	212	Tan sandy clay
212	232	Sand & gravel
232	292	Sand, gravel & clay
292	352	Gravel & sandy clay
352	392	Sand & clay
392	412	Sandy clay & gravel
412	432	Sand
432	452	Tan & blue sandy clay & gravel
452	612	Sand & sandy blue clay
612	632	Gravel
632	665	Gravel & sandy clay
		Continuation of construction log
430	515	26" hole, Blank, Low Carbon Steel .313 wall
515	545	26" hole, Screen, Stainless Steel .050 slot
545	605	26" hole, Blank, Low Carbon Steel. .313 wall
605	645	26" hole, Screen, Stainless Steel .050 slot
645	650	26" hole, Blank, Low Carbon Steel .313 wall

Total Depth of Boring 665 Feet

Total Depth of Completed Well 650 Feet

Well Owner

Name SC Sonoma Development LLC

Mailing Address 2411 W. Sahara Ave.

City Las Vegas State NV Zip 89102

Well Location

Address 5000 Whistler Ave

City Rohnert Park County Sonoma

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ___ Decimal Lat. ___ Decimal Long. ___

APN Book 046 Page 021 Parcel 020

Township ___ Range ___ Section ___

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

⦿ New Well
○ Modification/Repair
○ Deepen
○ Other ___
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

⦿ Water Supply
☑ Domestic ☑ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ___

Water Level and Yield of Completed Well

Depth to first water ___ (Feet below surface)

Depth to Static Water Level 55 (Feet) Date Measured 12/03/2008

Estimated Yield * 500 (GPM) Test Type Constant Rate

Test Length 24.0 (Hours) Total Drawdown 125 (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	38	36	Conductor	Galvanized		30		
0	110	26	Fill pipe	Low Carbon Steel	SCH 40	4		
0	390	26	Sound tube	Low Carbon Steel	SCH 40	2		
0	200	26	Blank	Low Carbon Steel	.250	12.75		
200	400	26	Blank	Low Carbon Steel	.313	12.75		
400	430	26	Screen	304 Stainless Steel		12.75	Wire Wrap	0.050

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	100	Cement	10 SACK

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other ___

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name MAGGIORA BROS DRILLING INC
Person, Firm or Corporation

595 AIRPORT BLVD (Address) WATSONVILLE (City) CA (State) 95076 (Zip)

Signed [signature] C-57 Licensed Water Well Contractor

12-16-2008 Date Signed 249957 C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0183443

Page 1 of 2

Owner's Well Number Well #2

Date Work Began 02/12/2013 Date Work Ended 4/9/2013

Local Permit Agency Sonoma County Permit and Resource Management Department

Permit Number WEL13-0018 Permit Date 2/11/13

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Reverse Circulation Rotary Drilling Fluid Fresh Water

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0	12	Brn. clay & gravel
12	30	Gray sandy clay
30	90	Blue clay
90	110	Blue clay, sand & gravel
110	130	Sand & gravel
130	170	Silty clay, sand & gravel
170	190	Brn. sandy clay
190	350	Sand with streaks of brn. clay
350	370	Tan clay & gravel
370	430	Sand, gravel and streaks of tan clay
430	450	Gravel & tan clay
450	480	Tan clay
480	530	Gravel & clay
530	550	Tan clay
550	590	Clay & gravel
590	700	Blue & tan clay with gravel

Total Depth of Boring 700 Feet

Total Depth of Completed Well 680 Feet

Well Owner

Name Federated Indians of Granton Rancheria

Mailing Address 630 Bern Ct.

City Rohnert Park State CA Zip 94928

Well Location

Address 4600 Langner Ave.

City Rohnert Park County Sonoma

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Decimal Lat. Decimal Long.

APN Book 045 Page 073 Parcel 001

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

See Attached

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

⦿ New Well
○ Modification/Repair
○ Deepen
○ Other
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

⦿ Water Supply
☐ Domestic ☑ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level 42 (Feet) Date Measured 04/09/2013

Estimated Yield * 400 (GPM) Test Type Constant Rate

Test Length 2.0 (Hours) Total Drawdown 118 (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	50	32	Conductor	Low Carbon Steel	.375	26		
2	330	24	Blank	Low Carbon Steel	.313	12.75		
330	450	24	Screen	304 Stainless Steel		12.75	Wire Wrap	0.050
450	485	24	Blank	Low Carbon Steel	.313	12.75		
485	520	24	Screen	304 Stainless Steel		12.75	Wire Wrap	0.050
520	575	24	Blank	Low Carbon Steel	.313	12.75		

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	50	Cement	10.3 Sack
0	296	Cement	10.3 Sack
296	300	Fill	30 Mesh
300	700	Filter Pack	8 X 16

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Maggiora Bros. Drilling, Inc. (Person, Firm or Corporation)

595 Airport Blvd. (Address) Watsonville (City) CA (State) 95076 (Zip)

Signed (C-57 Licensed Water Well Contractor) 07/30/2013 (Date Signed) 249957 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0183443

Page 2 of 2

Owner's Well Number Well #2

Date Work Began 02/12/2013 Date Work Ended 7/1/2013

Local Permit Agency Sonoma County Permit and Resource Management Department

Permit Number WEL13-0018 Permit Date 2/11/13

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Reverse Circulation Rotary Drilling Fluid Fresh Water

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)

Total Depth of Boring 700 Feet

Total Depth of Completed Well 680 Feet

Well Owner

Name Federated Indians of Granton Rancheria

Mailing Address 630 Bern Ct.

City Rohnert Park State CA Zip 94928

Well Location

Address 4600 Langner Ave.

City Rohnert Park County Sonoma

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ___ Decimal Lat. ___ Decimal Long. ___

APN Book 045 Page 073 Parcel 001

Township ___ Range ___ Section ___

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

◉ New Well
○ Modification/Repair
○ Deepen
○ Other ___
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

◉ Water Supply
☐ Domestic ☑ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ___

Water Level and Yield of Completed Well

Depth to first water ___ (Feet below surface)

Depth to Static Water Level ___ (Feet) Date Measured ___

Estimated Yield * ___ (GPM) Test Type ___

Test Length ___ (Hours) Total Drawdown ___ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)
575	625	24	Screen	304 Stainless Steel		12.75	Wire Wrap	0.050
625	650	24	Blank	Low Carbon Steel	.313	12.75		
650	670	24	Screen	304 Stainless Steel		12.75	Wire Wrap	0.050
670	680	24	Blank	Low Carbon Steel	.313	12.75		
2	310	24	Fill pipe	Low Carbon Steel	.15	2.38		
2	329	24	Sounding pip	Low Carbon Steel	..22	3.5		

Annular Material

Depth from Surface Feet	to Feet	Fill	Description

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other ___

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Maggiora Bros. Drilling, Inc.
Person, Firm or Corporation

595 Airport Blvd. (Address) Watsonville (City) CA (State) 95076 (Zip)

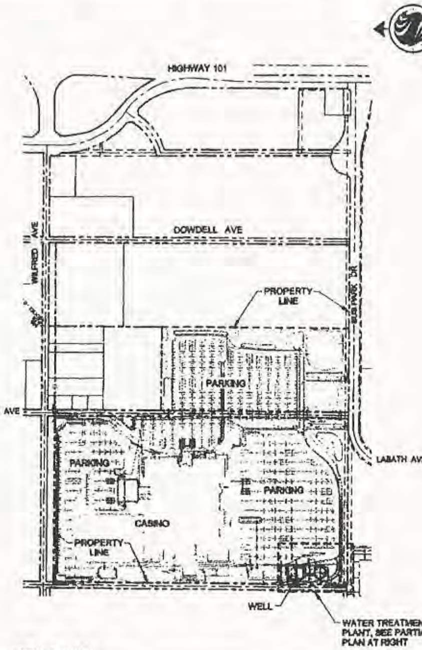
Signed ___ C-57 Licensed Water Well Contractor

07/30/2013 Date Signed

249957 C-57 License Number

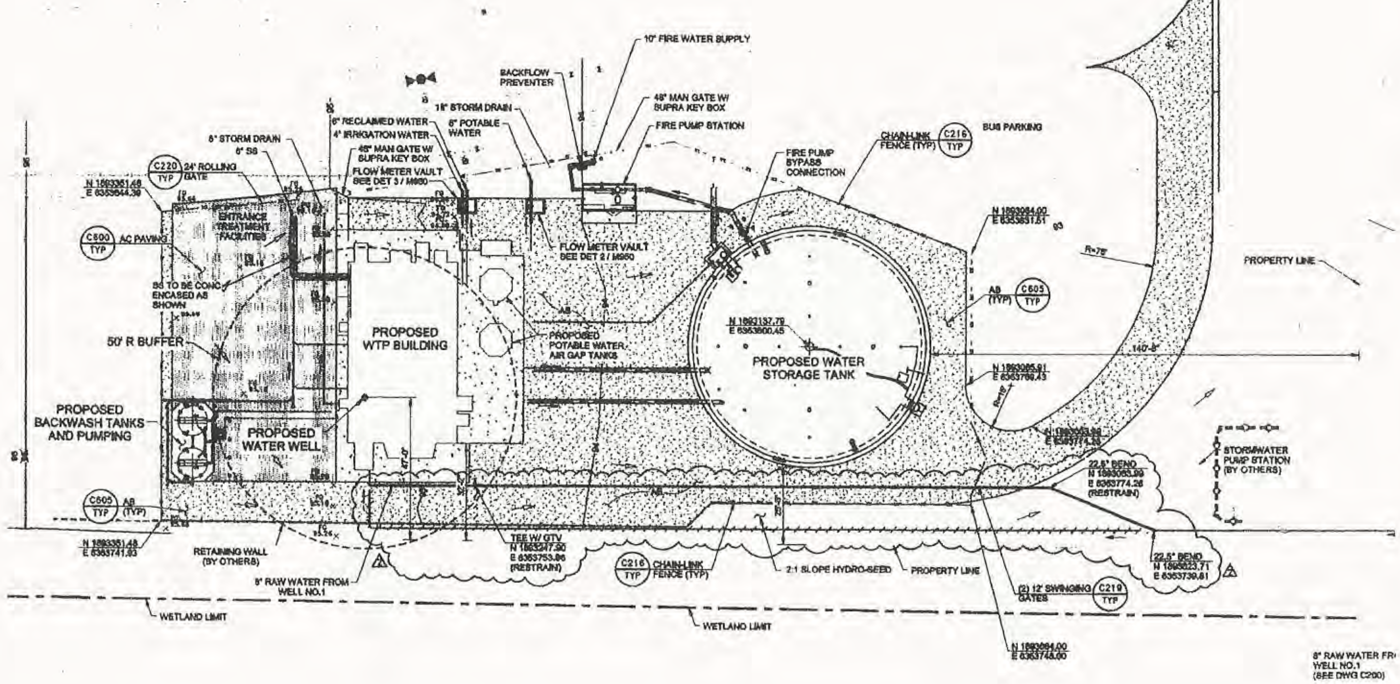
DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM



KEY PLAN

SCALE: HORZ. 1"=400'



NOTES:

1. ALL FACILITIES SHOWN ARE PROPOSED.

PARTIAL SITE PLAN

SCALE: 1"=20'

NOTE:

NEW WELL SITE PLAN ADAPTED FROM THE PROJECT SITE PLAN TO IDENTIFY THE NEW WELL LOCATION AND DIMENSIONAL RELATIONSHIPS TO THE PARCEL BOUNDARY AND OTHER FACILITIES AND UTILITIES.

Revision	By	Appd.	YY.MM.DD
WTP DELTA 8 REVISIONS	RRR	DA	12.12.05
CONFORMED	RRR	DA	12.11.02

FEDERATED INDIANS OF GRATON RANCHERIA

CONFORMED FOR PERMITTING AND BIDDING

Copyright Reserved

The Contractor shall verify and be responsible for all dimensions. Any errors or omissions shall be reported to Stantec without delay.

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

BAR IS ONE INCH AT FULL SCALE

IF NOT ONE INCH ON THIS SHEET SCALE ACCORDINGLY

Stantec

Stantec Consulting Services Inc.
3875 Atherton Rd
Rocklin CA
95765
Tel. 916.773.8100
Fax. 916.773.8448
www.stantec.com

Client / Project

Federated Indians of Graton Rancheria
Graton Rancheria Casino - Phase 1
WATER TREATMENT FACILITY PROJECT
Build-Out Package
Sonoma County, California

Project No. 184030255

RRR Drawn | MAC Checked | DA Designed | 12/11/02 YY.MM.DD

Title

NEW WELL SITE PLAN

Drawing No.	Sheet	Scale	1"=20'
C100-A	11 of 109	Revision	0

APPENDIX F

CALEEMOD AIR QUALITY AND GHG ASSESSMENT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Graton Casino Expansion

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	1,500.00	Space	5.00	600,000.00	0
Hotel	221.00	Room	3.00	290,000.00	0
Movie Theater (No Matinee)	3,500.00	Seat	1.81	78,750.00	0
Quality Restaurant	28.00	1000sqft	0.64	28,000.00	0
User Defined Recreational	86.00	User Defined Unit	2.00	86,000.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2026

Utility Company Pacific Gas and Electric Company

CO2 Intensity (lb/MWhr) 203.98 **CH4 Intensity (lb/MWhr)** 0.033 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Site plans

Grading - Grading report

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialImported	0.00	7,500.00
tblLandUse	LandUseSquareFeet	320,892.00	290,000.00
tblLandUse	LandUseSquareFeet	0.00	86,000.00

tblLandUse	LotAcreage	13.50	5.00
tblLandUse	LotAcreage	7.37	3.00
tblLandUse	LotAcreage	0.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.3160	2.5110	2.8301	7.9900e-003	0.5600	0.0896	0.6496	0.1931	0.0837	0.2768	0.0000	730.6459	730.6459	0.0904	0.0434	745.8385
2024	2.9169	1.9363	2.6541	7.7200e-003	0.3887	0.0610	0.4496	0.1054	0.0573	0.1627	0.0000	709.0148	709.0148	0.0646	0.0463	724.4398
Maximum	**2.9169**	**2.5110**	**2.8301**	**7.9900e-003**	**0.5600**	**0.0896**	**0.6496**	**0.1931**	**0.0837**	**0.2768**	**0.0000**	**730.6459**	**730.6459**	**0.0904**	**0.0463**	**745.8385**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.3160	2.5110	2.8301	7.9900e-003	0.5600	0.0896	0.6496	0.1931	0.0837	0.2768	0.0000	730.6456	730.6456	0.0904	0.0434	745.8382
2024	2.9169	1.9363	2.6541	7.7200e-003	0.3887	0.0610	0.4496	0.1054	0.0573	0.1627	0.0000	709.0145	709.0145	0.0646	0.0463	724.4396
Maximum	**2.9169**	**2.5110**	**2.8301**	**7.9900e-003**	**0.5600**	**0.0896**	**0.6496**	**0.1931**	**0.0837**	**0.2768**	**0.0000**	**730.6456**	**730.6456**	**0.0904**	**0.0463**	**745.8382**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2023	6-30-2023	1.0923	1.0923
2	7-1-2023	9-30-2023	0.8658	0.8658
3	10-1-2023	12-31-2023	0.8888	0.8888
4	1-1-2024	3-31-2024	0.8343	0.8343
5	4-1-2024	6-30-2024	0.8125	0.8125
6	7-1-2024	9-30-2024	2.1413	2.1413
		Highest	2.1413	2.1413

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.1929	4.4000e-004	0.0489	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0953	0.0953	2.5000e-004	0.0000	0.1015
Energy	0.1111	1.0098	0.8482	6.0600e-003		0.0767	0.0767		0.0767	0.0767	0.0000	1,742.1622	1,742.1622	0.1251	0.0328	1,755.0518
Mobile	4.3082	4.8882	33.9890	0.0606	6.4227	0.0572	6.4799	1.7214	0.0535	1.7749	0.0000	5,603.7196	5,603.7196	0.4552	0.3292	5,713.1946
Waste						0.0000	0.0000		0.0000	0.0000	29.7483	0.0000	29.7483	1.7581	0.0000	73.7002
Water						0.0000	0.0000		0.0000	0.0000	14.5084	23.9262	38.4346	1.4940	0.0357	86.4102
Total	**6.6122**	**5.8984**	**34.8861**	**0.0667**	**6.4227**	**0.1341**	**6.5568**	**1.7214**	**0.1304**	**1.8518**	**44.2567**	**7,369.9033**	**7,414.1600**	**3.8327**	**0.3976**	**7,628.4583**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.1929	4.4000e-004	0.0489	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0953	0.0953	2.5000e-004	0.0000	0.1015
Energy	0.1111	1.0098	0.8482	6.0600e-003		0.0767	0.0767		0.0767	0.0767	0.0000	1,742.1622	1,742.1622	0.1251	0.0328	1,755.0518
Mobile	4.3082	4.8882	33.9890	0.0606	6.4227	0.0572	6.4799	1.7214	0.0535	1.7749	0.0000	5,603.7196	5,603.7196	0.4552	0.3292	5,713.1946
Waste						0.0000	0.0000		0.0000	0.0000	29.7483	0.0000	29.7483	1.7581	0.0000	73.7002
Water						0.0000	0.0000		0.0000	0.0000	14.5084	23.9262	38.4346	1.4940	0.0357	86.4102
Total	**6.6122**	**5.8984**	**34.8861**	**0.0667**	**6.4227**	**0.1341**	**6.5568**	**1.7214**	**0.1304**	**1.8518**	**44.2567**	**7,369.9033**	**7,414.1600**	**3.8327**	**0.3976**	**7,628.4583**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2023	4/28/2023	5	20	
2	Site Preparation	Site Preparation	4/29/2023	5/12/2023	5	10	
3	Grading	Grading	5/13/2023	6/23/2023	5	30	

4	Building Construction	Building Construction	6/24/2023	8/16/2024	5	300	
5	Paving	Paving	8/17/2024	9/13/2024	5	20	
6	Architectural Coating	Architectural Coating	9/14/2024	10/11/2024	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 724,125; Non-Residential Outdoor: 241,375; Striped Parking Area: 36,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36

Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	938.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	455.00	177.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	91.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0227	0.2148	0.1964	3.9000e-004		9.9800e-003	9.9800e-003		9.2800e-003	9.2800e-003	0.0000	33.9921	33.9921	9.5200e-003	0.0000	34.2301
Total	**0.0227**	**0.2148**	**0.1964**	**3.9000e-004**		**9.9800e-003**	**9.9800e-003**		**9.2800e-003**	**9.2800e-003**	**0.0000**	**33.9921**	**33.9921**	**9.5200e-003**	**0.0000**	**34.2301**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-004	3.6000e-004	4.1200e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1800e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9530	0.9530	3.0000e-005	3.0000e-005	0.9630
Total	**5.3000e-004**	**3.6000e-004**	**4.1200e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1800e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9530**	**0.9530**	**3.0000e-005**	**3.0000e-005**	**0.9630**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0227	0.2148	0.1964	3.9000e-004		9.9800e-003	9.9800e-003		9.2800e-003	9.2800e-003	0.0000	33.9920	33.9920	9.5200e-003	0.0000	34.2300
Total	**0.0227**	**0.2148**	**0.1964**	**3.9000e-004**		**9.9800e-003**	**9.9800e-003**		**9.2800e-003**	**9.2800e-003**	**0.0000**	**33.9920**	**33.9920**	**9.5200e-003**	**0.0000**	**34.2300**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-004	3.6000e-004	4.1200e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1800e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9530	0.9530	3.0000e-005	3.0000e-005	0.9630
Total	**5.3000e-004**	**3.6000e-004**	**4.1200e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1800e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9530**	**0.9530**	**3.0000e-005**	**3.0000e-005**	**0.9630**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1376	0.0912	1.9000e-004		6.3300e-003	6.3300e-003		5.8200e-003	5.8200e-003	0.0000	16.7254	16.7254	5.4100e-003	0.0000	16.8606
Total	**0.0133**	**0.1376**	**0.0912**	**1.9000e-004**	**0.0983**	**6.3300e-003**	**0.1046**	**0.0505**	**5.8200e-003**	**0.0563**	**0.0000**	**16.7254**	**16.7254**	**5.4100e-003**	**0.0000**	**16.8606**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	2.2000e-004	2.4700e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5718	0.5718	2.0000e-005	2.0000e-005	0.5778
Total	**3.2000e-004**	**2.2000e-004**	**2.4700e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5718**	**0.5718**	**2.0000e-005**	**2.0000e-005**	**0.5778**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1376	0.0912	1.9000e-004		6.3300e-003	6.3300e-003		5.8200e-003	5.8200e-003	0.0000	16.7253	16.7253	5.4100e-003	0.0000	16.8606
Total	**0.0133**	**0.1376**	**0.0912**	**1.9000e-004**	**0.0983**	**6.3300e-003**	**0.1046**	**0.0505**	**5.8200e-003**	**0.0563**	**0.0000**	**16.7253**	**16.7253**	**5.4100e-003**	**0.0000**	**16.8606**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	2.2000e-004	2.4700e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5718	0.5718	2.0000e-005	2.0000e-005	0.5778
Total	**3.2000e-004**	**2.2000e-004**	**2.4700e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5718**	**0.5718**	**2.0000e-005**	**2.0000e-005**	**0.5778**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1385	0.0000	0.1385	0.0549	0.0000	0.0549	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0498	0.5177	0.4208	9.3000e-004		0.0214	0.0214		0.0197	0.0197	0.0000	81.8028	81.8028	0.0265	0.0000	82.4642
Total	**0.0498**	**0.5177**	**0.4208**	**9.3000e-004**	**0.1385**	**0.0214**	**0.1599**	**0.0549**	**0.0197**	**0.0745**	**0.0000**	**81.8028**	**81.8028**	**0.0265**	**0.0000**	**82.4642**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-003	0.0684	0.0149	2.9000e-004	7.8000e-003	4.8000e-004	8.2800e-003	2.1400e-003	4.5000e-004	2.5900e-003	0.0000	28.6191	28.6191	8.2000e-004	4.5200e-003	29.9875
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0600e-003	7.3000e-004	8.2400e-003	2.0000e-005	2.3500e-003	1.0000e-005	2.3700e-003	6.3000e-004	1.0000e-005	6.4000e-004	0.0000	1.9060	1.9060	7.0000e-005	6.0000e-005	1.9260
Total	**2.0600e-003**	**0.0691**	**0.0231**	**3.1000e-004**	**0.0102**	**4.9000e-004**	**0.0107**	**2.7700e-003**	**4.6000e-004**	**3.2300e-003**	**0.0000**	**30.5251**	**30.5251**	**8.9000e-004**	**4.5800e-003**	**31.9135**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1385	0.0000	0.1385	0.0549	0.0000	0.0549	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0498	0.5177	0.4208	9.3000e-004		0.0214	0.0214		0.0197	0.0197	0.0000	81.8027	81.8027	0.0265	0.0000	82.4641
Total	**0.0498**	**0.5177**	**0.4208**	**9.3000e-004**	**0.1385**	**0.0214**	**0.1599**	**0.0549**	**0.0197**	**0.0745**	**0.0000**	**81.8027**	**81.8027**	**0.0265**	**0.0000**	**82.4641**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-003	0.0684	0.0149	2.9000e-004	7.8000e-003	4.8000e-004	8.2800e-003	2.1400e-003	4.5000e-004	2.5900e-003	0.0000	28.6191	28.6191	8.2000e-004	4.5200e-003	29.9875
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0600e-003	7.3000e-004	8.2400e-003	2.0000e-005	2.3500e-003	1.0000e-005	2.3700e-003	6.3000e-004	1.0000e-005	6.4000e-004	0.0000	1.9060	1.9060	7.0000e-005	6.0000e-005	1.9260
Total	**2.0600e-003**	**0.0691**	**0.0231**	**3.1000e-004**	**0.0102**	**4.9000e-004**	**0.0107**	**2.7700e-003**	**4.6000e-004**	**3.2300e-003**	**0.0000**	**30.5251**	**30.5251**	**8.9000e-004**	**4.5800e-003**	**31.9135**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1062	0.9710	1.0965	1.8200e-003		0.0472	0.0472		0.0444	0.0444	0.0000	156.4682	156.4682	0.0372	0.0000	157.3987
Total	**0.1062**	**0.9710**	**1.0965**	**1.8200e-003**		**0.0472**	**0.0472**		**0.0444**	**0.0444**	**0.0000**	**156.4682**	**156.4682**	**0.0372**	**0.0000**	**157.3987**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0124	0.5256	0.1524	2.2100e-003	0.0702	2.7500e-003	0.0729	0.0203	2.6300e-003	0.0229	0.0000	214.4845	214.4845	3.9100e-003	0.0325	224.2556
Worker	0.1087	0.0745	0.8432	2.1300e-003	0.2410	1.4700e-003	0.2425	0.0642	1.3500e-003	0.0655	0.0000	195.1231	195.1231	6.9900e-003	6.3000e-003	197.1750
Total	**0.1211**	**0.6001**	**0.9956**	**4.3400e-003**	**0.3112**	**4.2200e-003**	**0.3154**	**0.0845**	**3.9800e-003**	**0.0884**	**0.0000**	**409.6077**	**409.6077**	**0.0109**	**0.0388**	**421.4306**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1062	0.9710	1.0965	1.8200e-003		0.0472	0.0472		0.0444	0.0444	0.0000	156.4680	156.4680	0.0372	0.0000	157.3986
Total	**0.1062**	**0.9710**	**1.0965**	**1.8200e-003**		**0.0472**	**0.0472**		**0.0444**	**0.0444**	**0.0000**	**156.4680**	**156.4680**	**0.0372**	**0.0000**	**157.3986**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0124	0.5256	0.1524	2.2100e-003	0.0702	2.7500e-003	0.0729	0.0203	2.6300e-003	0.0229	0.0000	214.4845	214.4845	3.9100e-003	0.0325	224.2556
Worker	0.1087	0.0745	0.8432	2.1300e-003	0.2410	1.4700e-003	0.2425	0.0642	1.3500e-003	0.0655	0.0000	195.1231	195.1231	6.9900e-003	6.3000e-003	197.1750
Total	**0.1211**	**0.6001**	**0.9956**	**4.3400e-003**	**0.3112**	**4.2200e-003**	**0.3154**	**0.0845**	**3.9800e-003**	**0.0884**	**0.0000**	**409.6077**	**409.6077**	**0.0109**	**0.0388**	**421.4306**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1214	1.1091	1.3338	2.2200e-003		0.0506	0.0506		0.0476	0.0476	0.0000	191.2755	191.2755	0.0452	0.0000	192.4063
Total	**0.1214**	**1.1091**	**1.3338**	**2.2200e-003**		**0.0506**	**0.0506**		**0.0476**	**0.0476**	**0.0000**	**191.2755**	**191.2755**	**0.0452**	**0.0000**	**192.4063**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0144	0.6369	0.1808	2.6500e-003	0.0857	3.3400e-003	0.0891	0.0248	3.1900e-003	0.0280	0.0000	257.8711	257.8711	4.8700e-003	0.0390	269.6219
Worker	0.1235	0.0806	0.9484	2.5200e-003	0.2946	1.6900e-003	0.2963	0.0784	1.5600e-003	0.0800	0.0000	230.7717	230.7717	7.7000e-003	7.1100e-003	233.0844
Total	**0.1379**	**0.7175**	**1.1292**	**5.1700e-003**	**0.3803**	**5.0300e-003**	**0.3854**	**0.1032**	**4.7500e-003**	**0.1080**	**0.0000**	**488.6428**	**488.6428**	**0.0126**	**0.0461**	**502.7063**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1214	1.1091	1.3338	2.2200e-003		0.0506	0.0506		0.0476	0.0476	0.0000	191.2753	191.2753	0.0452	0.0000	192.4061
Total	**0.1214**	**1.1091**	**1.3338**	**2.2200e-003**		**0.0506**	**0.0506**		**0.0476**	**0.0476**	**0.0000**	**191.2753**	**191.2753**	**0.0452**	**0.0000**	**192.4061**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0144	0.6369	0.1808	2.6500e-003	0.0857	3.3400e-003	0.0891	0.0248	3.1900e-003	0.0280	0.0000	257.8711	257.8711	4.8700e-003	0.0390	269.6219
Worker	0.1235	0.0806	0.9484	2.5200e-003	0.2946	1.6900e-003	0.2963	0.0784	1.5600e-003	0.0800	0.0000	230.7717	230.7717	7.7000e-003	7.1100e-003	233.0844
Total	**0.1379**	**0.7175**	**1.1292**	**5.1700e-003**	**0.3803**	**5.0300e-003**	**0.3854**	**0.1032**	**4.7500e-003**	**0.1080**	**0.0000**	**488.6428**	**488.6428**	**0.0126**	**0.0461**	**502.7063**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8800e-003	0.0953	0.1463	2.3000e-004		4.6900e-003	4.6900e-003		4.3100e-003	4.3100e-003	0.0000	20.0265	20.0265	6.4800e-003	0.0000	20.1885
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.8800e-003**	**0.0953**	**0.1463**	**2.3000e-004**		**4.6900e-003**	**4.6900e-003**		**4.3100e-003**	**4.3100e-003**	**0.0000**	**20.0265**	**20.0265**	**6.4800e-003**	**0.0000**	**20.1885**

3.6 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.2000e-004	3.7900e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1800e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9222	0.9222	3.0000e-005	3.0000e-005	0.9314
Total	**4.9000e-004**	**3.2000e-004**	**3.7900e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1800e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9222**	**0.9222**	**3.0000e-005**	**3.0000e-005**	**0.9314**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8800e-003	0.0953	0.1463	2.3000e-004		4.6900e-003	4.6900e-003		4.3100e-003	4.3100e-003	0.0000	20.0265	20.0265	6.4800e-003	0.0000	20.1884
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.8800e-003**	**0.0953**	**0.1463**	**2.3000e-004**		**4.6900e-003**	**4.6900e-003**		**4.3100e-003**	**4.3100e-003**	**0.0000**	**20.0265**	**20.0265**	**6.4800e-003**	**0.0000**	**20.1884**

3.6 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.2000e-004	3.7900e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1800e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9222	0.9222	3.0000e-005	3.0000e-005	0.9314
Total	**4.9000e-004**	**3.2000e-004**	**3.7900e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1800e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9222**	**0.9222**	**3.0000e-005**	**3.0000e-005**	**0.9314**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.6424					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8100e-003	0.0122	0.0181	3.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5569
Total	**2.6442**	**0.0122**	**0.0181**	**3.0000e-005**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5569**

3.7 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9900e-003	1.9500e-003	0.0230	6.0000e-005	7.1400e-003	4.0000e-005	7.1800e-003	1.9000e-003	4.0000e-005	1.9400e-003	0.0000	5.5945	5.5945	1.9000e-004	1.7000e-004	5.6505
Total	**2.9900e-003**	**1.9500e-003**	**0.0230**	**6.0000e-005**	**7.1400e-003**	**4.0000e-005**	**7.1800e-003**	**1.9000e-003**	**4.0000e-005**	**1.9400e-003**	**0.0000**	**5.5945**	**5.5945**	**1.9000e-004**	**1.7000e-004**	**5.6505**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.6424					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8100e-003	0.0122	0.0181	3.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5568
Total	**2.6442**	**0.0122**	**0.0181**	**3.0000e-005**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5568**

3.7 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9900e-003	1.9500e-003	0.0230	6.0000e-005	7.1400e-003	4.0000e-005	7.1800e-003	1.9000e-003	4.0000e-005	1.9400e-003	0.0000	5.5945	5.5945	1.9000e-004	1.7000e-004	5.6505
Total	**2.9900e-003**	**1.9500e-003**	**0.0230**	**6.0000e-005**	**7.1400e-003**	**4.0000e-005**	**7.1800e-003**	**1.9000e-003**	**4.0000e-005**	**1.9400e-003**	**0.0000**	**5.5945**	**5.5945**	**1.9000e-004**	**1.7000e-004**	**5.6505**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	4.3082	4.8882	33.9890	0.0606	6.4227	0.0572	6.4799	1.7214	0.0535	1.7749	0.0000	5,603.7196	5,603.7196	0.4552	0.3292	5,713.1946
Unmitigated	4.3082	4.8882	33.9890	0.0606	6.4227	0.0572	6.4799	1.7214	0.0535	1.7749	0.0000	5,603.7196	5,603.7196	0.4552	0.3292	5,713.1946

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Enclosed Parking with Elevator	0.00	0.00	0.00		
Hotel	1,847.56	1,809.99	1314.95	3,548,405	3,548,405
Movie Theater (No Matinee)	6,160.00	7,840.00	6475.00	11,157,304	11,157,304
Quality Restaurant	2,347.52	2,521.12	2015.16	2,760,525	2,760,525
User Defined Recreational	0.00	0.00	0.00		
Total	10,355.08	12,171.11	9,805.11	17,466,234	17,466,234

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking with Elevator	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
Hotel	14.70	6.60	6.60	19.40	61.60	19.00	58	38	4
Movie Theater (No Matinee)	14.70	6.60	6.60	1.80	79.20	19.00	66	17	17
Quality Restaurant	14.70	6.60	6.60	12.00	69.00	19.00	38	18	44
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.552996	0.056868	0.169620	0.121608	0.033119	0.008363	0.014999	0.006644	0.001093	0.000289	0.028928	0.001532	0.003941
Hotel	0.552996	0.056868	0.169620	0.121608	0.033119	0.008363	0.014999	0.006644	0.001093	0.000289	0.028928	0.001532	0.003941
Movie Theater (No Matinee)	0.552996	0.056868	0.169620	0.121608	0.033119	0.008363	0.014999	0.006644	0.001093	0.000289	0.028928	0.001532	0.003941
Quality Restaurant	0.552996	0.056868	0.169620	0.121608	0.033119	0.008363	0.014999	0.006644	0.001093	0.000289	0.028928	0.001532	0.003941
User Defined Recreational	0.552996	0.056868	0.169620	0.121608	0.033119	0.008363	0.014999	0.006644	0.001093	0.000289	0.028928	0.001532	0.003941

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	642.9139	642.9139	0.1040	0.0126	649.2712
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	642.9139	642.9139	0.1040	0.0126	649.2712
NaturalGas Mitigated	0.1111	1.0098	0.8482	6.0600e-003		0.0767	0.0767		0.0767	0.0767	0.0000	1,099.2483	1,099.2483	0.0211	0.0202	1,105.7806
NaturalGas Unmitigated	0.1111	1.0098	0.8482	6.0600e-003		0.0767	0.0767		0.0767	0.0767	0.0000	1,099.2483	1,099.2483	0.0211	0.0202	1,105.7806

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hotel	1.27339e +007	0.0687	0.6242	0.5243	3.7500e-003		0.0474	0.0474		0.0474	0.0474	0.0000	679.5294	679.5294	0.0130	0.0125	683.5675
Movie Theater (No Matinee)	2.06168e +006	0.0111	0.1011	0.0849	6.1000e-004		7.6800e-003	7.6800e-003		7.6800e-003	7.6800e-003	0.0000	110.0188	110.0188	2.1100e-003	2.0200e-003	110.6726
Quality Restaurant	5.80356e +006	0.0313	0.2845	0.2390	1.7100e-003		0.0216	0.0216		0.0216	0.0216	0.0000	309.7001	309.7001	5.9400e-003	5.6800e-003	311.5405
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.1111**	**1.0098**	**0.8482**	**6.0700e-003**		**0.0767**	**0.0767**		**0.0767**	**0.0767**	**0.0000**	**1,099.2483**	**1,099.2483**	**0.0211**	**0.0202**	**1,105.7806**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hotel	1.27339e+007	0.0687	0.6242	0.5243	3.7500e-003		0.0474	0.0474		0.0474	0.0474	0.0000	679.5294	679.5294	0.0130	0.0125	683.5675
Movie Theater (No Matinee)	2.06168e+006	0.0111	0.1011	0.0849	6.1000e-004		7.6800e-003	7.6800e-003		7.6800e-003	7.6800e-003	0.0000	110.0188	110.0188	2.1100e-003	2.0200e-003	110.6726
Quality Restaurant	5.80356e+006	0.0313	0.2845	0.2390	1.7100e-003		0.0216	0.0216		0.0216	0.0216	0.0000	309.7001	309.7001	5.9400e-003	5.6800e-003	311.5405
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.1111**	**1.0098**	**0.8482**	**6.0700e-003**		**0.0767**	**0.0767**		**0.0767**	**0.0767**	**0.0000**	**1,099.2483**	**1,099.2483**	**0.0211**	**0.0202**	**1,105.7806**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	3.264e +006	301.9976	0.0489	5.9200e-003	304.9838
Hotel	2.146e +006	198.5560	0.0321	3.8900e-003	200.5194
Movie Theater (No Matinee)	637875	59.0186	9.5500e-003	1.1600e-003	59.6022
Quality Restaurant	900760	83.3417	0.0135	1.6300e-003	84.1658
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**642.9139**	**0.1040**	**0.0126**	**649.2712**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	3.264e +006	301.9976	0.0489	5.9200e-003	304.9838
Hotel	2.146e +006	198.5560	0.0321	3.8900e-003	200.5194
Movie Theater (No Matinee)	637875	59.0186	9.5500e-003	1.1600e-003	59.6022
Quality Restaurant	900760	83.3417	0.0135	1.6300e-003	84.1658
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**642.9139**	**0.1040**	**0.0126**	**649.2712**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.1929	4.4000e-004	0.0489	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0953	0.0953	2.5000e-004	0.0000	0.1015
Unmitigated	2.1929	4.4000e-004	0.0489	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0953	0.0953	2.5000e-004	0.0000	0.1015

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2642					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.9242					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.5000e-003	4.4000e-004	0.0489	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0953	0.0953	2.5000e-004	0.0000	0.1015
Total	**2.1929**	**4.4000e-004**	**0.0489**	**0.0000**		**1.7000e-004**	**1.7000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**0.0953**	**0.0953**	**2.5000e-004**	**0.0000**	**0.1015**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2642					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.9242					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.5000e-003	4.4000e-004	0.0489	0.0000		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	0.0953	0.0953	2.5000e-004	0.0000	0.1015
Total	**2.1929**	**4.4000e-004**	**0.0489**	**0.0000**		**1.7000e-004**	**1.7000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**0.0953**	**0.0953**	**2.5000e-004**	**0.0000**	**0.1015**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	38.4346	1.4940	0.0357	86.4102
Unmitigated	38.4346	1.4940	0.0357	86.4102

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Hotel	5.60606 / 0.622895	4.7869	0.1832	4.3700e-003	10.6689
Movie Theater (No Matinee)	31.6261 / 2.01869	26.5207	1.0332	0.0247	59.6985
Quality Restaurant	8.49894 / 0.542486	7.1270	0.2777	6.6300e-003	16.0429
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**38.4346**	**1.4940**	**0.0357**	**86.4102**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Hotel	5.60606 / 0.622895	4.7869	0.1832	4.3700e-003	10.6689
Movie Theater (No Matinee)	31.6261 / 2.01869	26.5207	1.0332	0.0247	59.6985
Quality Restaurant	8.49894 / 0.542486	7.1270	0.2777	6.6300e-003	16.0429
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**38.4346**	**1.4940**	**0.0357**	**86.4102**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	29.7483	1.7581	0.0000	73.7002
Unmitigated	29.7483	1.7581	0.0000	73.7002

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Hotel	121	24.5619	1.4516	0.0000	60.8511
Quality Restaurant	25.55	5.1864	0.3065	0.0000	12.8491
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**29.7483**	**1.7581**	**0.0000**	**73.7002**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Hotel	121	24.5619	1.4516	0.0000	60.8511
Quality Restaurant	25.55	5.1864	0.3065	0.0000	12.8491
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**29.7483**	**1.7581**	**0.0000**	**73.7002**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Equipment Type	Number

11.0 Vegetation

Graton Casino Hotel and Casino

Sonoma-San Francisco County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hotel	221.00	Room	3.00	290,000.00	0
Quality Restaurant	28.00	1000sqft	0.64	28,000.00	0
User Defined Recreational	86.00	User Defined Unit	2.00	86,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Phase II construction

Construction Phase - Construction assumed to take place over an approximate 10 month period

Trips and VMT - Trip haul revised based on construction phasing.

Grading - Grading report

On-road Fugitive Dust -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	150.00
tblLandUse	LandUseSquareFeet	320,892.00	290,000.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblLandUse	LandUseSquareFeet	0.00	86,000.00
tblLandUse	LotAcreage	7.37	3.00
tblLandUse	LotAcreage	0.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	50.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	210.9580	27.2105	21.5588	0.0510	19.8049	1.2302	21.0350	10.1417	1.1318	11.2734	0.0000	5,082.8573	5,082.8573	1.1966	0.2271	5,167.1452
2025	210.9402	1.2037	2.6587	5.3000e-003	0.2793	0.0530	0.3323	0.0741	0.0529	0.1269	0.0000	524.0929	524.0929	0.0219	6.1100e-003	526.4602
Maximum	**210.9580**	**27.2105**	**21.5588**	**0.0510**	**19.8049**	**1.2302**	**21.0350**	**10.1417**	**1.1318**	**11.2734**	**0.0000**	**5,082.8573**	**5,082.8573**	**1.1966**	**0.2271**	**5,167.1452**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	210.9580	27.2105	21.5588	0.0510	19.8049	1.2302	21.0350	10.1417	1.1318	11.2734	0.0000	5,082.8573	5,082.8573	1.1966	0.2271	5,167.1452
2025	210.9402	1.2037	2.6587	5.3000e-003	0.2793	0.0530	0.3323	0.0741	0.0529	0.1269	0.0000	524.0929	524.0929	0.0219	6.1100e-003	526.4602
Maximum	**210.9580**	**27.2105**	**21.5588**	**0.0510**	**19.8049**	**1.2302**	**21.0350**	**10.1417**	**1.1318**	**11.2734**	**0.0000**	**5,082.8573**	**5,082.8573**	**1.1966**	**0.2271**	**5,167.1452**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.8031	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Energy	0.5477	4.9792	4.1825	0.0299		0.3784	0.3784		0.3784	0.3784		5,975.0073	5,975.0073	0.1145	0.1095	6,010.5137
Mobile	11.9871	11.2129	79.0882	0.1432	14.1791	0.1359	14.3149	3.7869	0.1272	3.9141		14,812.3046	14,812.3046	1.1396	0.8137	15,083.2645
Total	**22.3379**	**16.1924**	**83.3049**	**0.1731**	**14.1791**	**0.5144**	**14.6935**	**3.7869**	**0.5058**	**4.2927**		**20,787.3852**	**20,787.3852**	**1.2544**	**0.9232**	**21,093.8563**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.8031	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Energy	0.5477	4.9792	4.1825	0.0299		0.3784	0.3784		0.3784	0.3784		5,975.0073	5,975.0073	0.1145	0.1095	6,010.5137
Mobile	11.9871	11.2129	79.0882	0.1432	14.1791	0.1359	14.3149	3.7869	0.1272	3.9141		14,812.3046	14,812.3046	1.1396	0.8137	15,083.2645
Total	**22.3379**	**16.1924**	**83.3049**	**0.1731**	**14.1791**	**0.5144**	**14.6935**	**3.7869**	**0.5058**	**4.2927**		**20,787.3852**	**20,787.3852**	**1.2544**	**0.9232**	**21,093.8563**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/1/2024	2/28/2024	5	20	
2	Site Preparation	Site Preparation	2/29/2024	3/13/2024	5	10	
3	Grading	Grading	3/14/2024	4/10/2024	5	20	
4	Building Construction	Building Construction	4/11/2024	11/6/2024	5	150	
5	Paving	Paving	11/7/2024	12/4/2024	5	20	
6	Architectural Coating	Architectural Coating	12/5/2024	1/1/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 20

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 606,000; Non-Residential Outdoor: 202,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	50.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	170.00	66.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	34.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2437	20.8781	19.7073	0.0388		0.9602	0.9602		0.8922	0.8922		3,747.4228	3,747.4228	1.0485		3,773.6345
Total	**2.2437**	**20.8781**	**19.7073**	**0.0388**		**0.9602**	**0.9602**		**0.8922**	**0.8922**		**3,747.4228**	**3,747.4228**	**1.0485**		**3,773.6345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0514	0.0287	0.4046	1.0600e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		109.6822	109.6822	3.1900e-003	2.9000e-003	110.6258
Total	**0.0514**	**0.0287**	**0.4046**	**1.0600e-003**	**0.1232**	**6.8000e-004**	**0.1239**	**0.0327**	**6.3000e-004**	**0.0333**		**109.6822**	**109.6822**	**3.1900e-003**	**2.9000e-003**	**110.6258**

3.2 Demolition - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2437	20.8781	19.7073	0.0388		0.9602	0.9602		0.8922	0.8922	0.0000	3,747.422 8	3,747.422 8	1.0485		3,773.634 5
Total	**2.2437**	**20.8781**	**19.7073**	**0.0388**		**0.9602**	**0.9602**		**0.8922**	**0.8922**	**0.0000**	**3,747.422 8**	**3,747.422 8**	**1.0485**		**3,773.634 5**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0514	0.0287	0.4046	1.0600e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		109.6822	109.6822	3.1900e-003	2.9000e-003	110.6258
Total	**0.0514**	**0.0287**	**0.4046**	**1.0600e-003**	**0.1232**	**6.8000e-004**	**0.1239**	**0.0327**	**6.3000e-004**	**0.0333**		**109.6822**	**109.6822**	**3.1900e-003**	**2.9000e-003**	**110.6258**

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0617	0.0345	0.4856	1.2800e-003	0.1479	8.1000e-004	0.1487	0.0392	7.5000e-004	0.0400		131.6186	131.6186	3.8300e-003	3.4800e-003	132.7509
Total	**0.0617**	**0.0345**	**0.4856**	**1.2800e-003**	**0.1479**	**8.1000e-004**	**0.1487**	**0.0392**	**7.5000e-004**	**0.0400**		**131.6186**	**131.6186**	**3.8300e-003**	**3.4800e-003**	**132.7509**

3.3 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0617	0.0345	0.4856	1.2800e-003	0.1479	8.1000e-004	0.1487	0.0392	7.5000e-004	0.0400		131.6186	131.6186	3.8300e-003	3.4800e-003	132.7509
Total	**0.0617**	**0.0345**	**0.4856**	**1.2800e-003**	**0.1479**	**8.1000e-004**	**0.1487**	**0.0392**	**7.5000e-004**	**0.0400**		**131.6186**	**131.6186**	**3.8300e-003**	**3.4800e-003**	**132.7509**

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.6617	17.0310	14.7594	0.0297		0.7244	0.7244		0.6665	0.6665		2,873.0541	2,873.0541	0.9292		2,896.2842
Total	**1.6617**	**17.0310**	**14.7594**	**0.0297**	**7.0826**	**0.7244**	**7.8070**	**3.4247**	**0.6665**	**4.0912**		**2,873.0541**	**2,873.0541**	**0.9292**		**2,896.2842**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	5.3200e-003	0.3477	0.0788	1.5200e-003	0.0433	2.5100e-003	0.0458	0.0118	2.4000e-003	0.0142		165.1919	165.1919	4.9400e-003	0.0261	173.0989
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0514	0.0287	0.4046	1.0600e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		109.6822	109.6822	3.1900e-003	2.9000e-003	110.6258
Total	**0.0567**	**0.3765**	**0.4834**	**2.5800e-003**	**0.1665**	**3.1900e-003**	**0.1697**	**0.0445**	**3.0300e-003**	**0.0475**		**274.8741**	**274.8741**	**8.1300e-003**	**0.0290**	**283.7247**

3.4 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.6617	17.0310	14.7594	0.0297		0.7244	0.7244		0.6665	0.6665	0.0000	2,873.054 1	2,873.054 1	0.9292		2,896.284 2
Total	**1.6617**	**17.0310**	**14.7594**	**0.0297**	**7.0826**	**0.7244**	**7.8070**	**3.4247**	**0.6665**	**4.0912**	**0.0000**	**2,873.054 1**	**2,873.054 1**	**0.9292**		**2,896.284 2**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	5.3200e-003	0.3477	0.0788	1.5200e-003	0.0433	2.5100e-003	0.0458	0.0118	2.4000e-003	0.0142		165.1919	165.1919	4.9400e-003	0.0261	173.0989
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0514	0.0287	0.4046	1.0600e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		109.6822	109.6822	3.1900e-003	2.9000e-003	110.6258
Total	**0.0567**	**0.3765**	**0.4834**	**2.5800e-003**	**0.1665**	**3.1900e-003**	**0.1697**	**0.0445**	**3.0300e-003**	**0.0475**		**274.8741**	**274.8741**	**8.1300e-003**	**0.0290**	**283.7247**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.698 9	2,555.698 9	0.6044		2,570.807 7
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.698 9**	**2,555.698 9**	**0.6044**		**2,570.807 7**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0663	2.7892	0.8062	0.0120	0.4023	0.0151	0.4174	0.1157	0.0144	0.1301		1,284.093 7	1,284.093 7	0.0243	0.1942	1,342.579 1
Worker	0.5822	0.3256	4.5858	0.0121	1.3965	7.6900e-003	1.4042	0.3704	7.0900e-003	0.3775		1,243.064 7	1,243.064 7	0.0362	0.0329	1,253.758 5
Total	**0.6485**	**3.1149**	**5.3919**	**0.0240**	**1.7988**	**0.0227**	**1.8216**	**0.4861**	**0.0215**	**0.5076**		**2,527.158 4**	**2,527.158 4**	**0.0605**	**0.2271**	**2,596.337 6**

3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0663	2.7892	0.8062	0.0120	0.4023	0.0151	0.4174	0.1157	0.0144	0.1301		1,284.0937	1,284.0937	0.0243	0.1942	1,342.5791
Worker	0.5822	0.3256	4.5858	0.0121	1.3965	7.6900e-003	1.4042	0.3704	7.0900e-003	0.3775		1,243.0647	1,243.0647	0.0362	0.0329	1,253.7585
Total	**0.6485**	**3.1149**	**5.3919**	**0.0240**	**1.7988**	**0.0227**	**1.8216**	**0.4861**	**0.0215**	**0.5076**		**2,527.1584**	**2,527.1584**	**0.0605**	**0.2271**	**2,596.3376**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0514	0.0287	0.4046	1.0600e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		109.6822	109.6822	3.1900e-003	2.9000e-003	110.6258
Total	**0.0514**	**0.0287**	**0.4046**	**1.0600e-003**	**0.1232**	**6.8000e-004**	**0.1239**	**0.0327**	**6.3000e-004**	**0.0333**		**109.6822**	**109.6822**	**3.1900e-003**	**2.9000e-003**	**110.6258**

3.6 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0514	0.0287	0.4046	1.0600e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		109.6822	109.6822	3.1900e-003	2.9000e-003	110.6258
Total	**0.0514**	**0.0287**	**0.4046**	**1.0600e-003**	**0.1232**	**6.8000e-004**	**0.1239**	**0.0327**	**6.3000e-004**	**0.0333**		**109.6822**	**109.6822**	**3.1900e-003**	**2.9000e-003**	**110.6258**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	210.6608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.8443
Total	**210.8415**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.8443**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1165	0.0651	0.9172	2.4100e-003	0.2793	1.5400e-003	0.2808	0.0741	1.4200e-003	0.0755		248.6129	248.6129	7.2300e-003	6.5700e-003	250.7517
Total	**0.1165**	**0.0651**	**0.9172**	**2.4100e-003**	**0.2793**	**1.5400e-003**	**0.2808**	**0.0741**	**1.4200e-003**	**0.0755**		**248.6129**	**248.6129**	**7.2300e-003**	**6.5700e-003**	**250.7517**

3.7 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	210.6608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.8443
Total	**210.8415**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.8443**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1165	0.0651	0.9172	2.4100e-003	0.2793	1.5400e-003	0.2808	0.0741	1.4200e-003	0.0755		248.6129	248.6129	7.2300e-003	6.5700e-003	250.7517
Total	**0.1165**	**0.0651**	**0.9172**	**2.4100e-003**	**0.2793**	**1.5400e-003**	**0.2808**	**0.0741**	**1.4200e-003**	**0.0755**		**248.6129**	**248.6129**	**7.2300e-003**	**6.5700e-003**	**250.7517**

3.7 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	210.6608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**210.8316**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1086	0.0582	0.8496	2.3300e-003	0.2793	1.4600e-003	0.2808	0.0741	1.3500e-003	0.0754		242.6448	242.6448	6.5300e-003	6.1100e-003	244.6284
Total	**0.1086**	**0.0582**	**0.8496**	**2.3300e-003**	**0.2793**	**1.4600e-003**	**0.2808**	**0.0741**	**1.3500e-003**	**0.0754**		**242.6448**	**242.6448**	**6.5300e-003**	**6.1100e-003**	**244.6284**

3.7 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	210.6608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**210.8316**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1086	0.0582	0.8496	2.3300e-003	0.2793	1.4600e-003	0.2808	0.0741	1.3500e-003	0.0754		242.6448	242.6448	6.5300e-003	6.1100e-003	244.6284
Total	**0.1086**	**0.0582**	**0.8496**	**2.3300e-003**	**0.2793**	**1.4600e-003**	**0.2808**	**0.0741**	**1.3500e-003**	**0.0754**		**242.6448**	**242.6448**	**6.5300e-003**	**6.1100e-003**	**244.6284**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	11.9871	11.2129	79.0882	0.1432	14.1791	0.1359	14.3149	3.7869	0.1272	3.9141		14,812.30 46	14,812.30 46	1.1396	0.8137	15,083.26 45
Unmitigated	11.9871	11.2129	79.0882	0.1432	14.1791	0.1359	14.3149	3.7869	0.1272	3.9141		14,812.30 46	14,812.30 46	1.1396	0.8137	15,083.26 45

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hotel	1,847.56	1,809.99	1314.95	3,548,405	3,548,405
Quality Restaurant	2,347.52	2,521.12	2015.16	2,760,525	2,760,525
User Defined Recreational	0.00	0.00	0.00		
Total	4,195.08	4,331.11	3,330.11	6,308,930	6,308,930

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hotel	14.70	6.60	6.60	19.40	61.60	19.00	58	38	4
Quality Restaurant	14.70	6.60	6.60	12.00	69.00	19.00	38	18	44
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hotel	0.536774	0.058783	0.173424	0.127345	0.036375	0.008877	0.014453	0.006568	0.001093	0.000297	0.030119	0.001546	0.004347
Quality Restaurant	0.536774	0.058783	0.173424	0.127345	0.036375	0.008877	0.014453	0.006568	0.001093	0.000297	0.030119	0.001546	0.004347
User Defined Recreational	0.536774	0.058783	0.173424	0.127345	0.036375	0.008877	0.014453	0.006568	0.001093	0.000297	0.030119	0.001546	0.004347

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.5477	4.9792	4.1825	0.0299		0.3784	0.3784		0.3784	0.3784		5,975.0073	5,975.0073	0.1145	0.1095	6,010.5137
NaturalGas Unmitigated	0.5477	4.9792	4.1825	0.0299		0.3784	0.3784		0.3784	0.3784		5,975.0073	5,975.0073	0.1145	0.1095	6,010.5137

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	34887.4	0.3762	3.4203	2.8731	0.0205		0.2600	0.2600		0.2600	0.2600		4,104.3997	4,104.3997	0.0787	0.0753	4,128.7901
Quality Restaurant	15900.2	0.1715	1.5588	1.3094	9.3500e-003		0.1185	0.1185		0.1185	0.1185		1,870.6076	1,870.6076	0.0359	0.0343	1,881.7237
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.5477**	**4.9792**	**4.1825**	**0.0299**		**0.3784**	**0.3784**		**0.3784**	**0.3784**		**5,975.0073**	**5,975.0073**	**0.1145**	**0.1095**	**6,010.5137**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	34.8874	0.3762	3.4203	2.8731	0.0205		0.2600	0.2600		0.2600	0.2600		4,104.3997	4,104.3997	0.0787	0.0753	4,128.7901
Quality Restaurant	15.9002	0.1715	1.5588	1.3094	9.3500e-003		0.1185	0.1185		0.1185	0.1185		1,870.6076	1,870.6076	0.0359	0.0343	1,881.7237
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.5477**	**4.9792**	**4.1825**	**0.0299**		**0.3784**	**0.3784**		**0.3784**	**0.3784**		**5,975.0073**	**5,975.0073**	**0.1145**	**0.1095**	**6,010.5137**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.8031	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Unmitigated	9.8031	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1543					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.6456					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.1500e-003	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Total	**9.8031**	**3.1000e-004**	**0.0342**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**		**0.0733**	**0.0733**	**1.9000e-004**		**0.0781**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1543					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.6456					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.1500e-003	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Total	**9.8031**	**3.1000e-004**	**0.0342**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**		**0.0733**	**0.0733**	**1.9000e-004**		**0.0781**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Graton Casino Hotel and Casino

Sonoma-San Francisco County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hotel	221.00	Room	3.00	290,000.00	0
Quality Restaurant	28.00	1000sqft	0.64	28,000.00	0
User Defined Recreational	86.00	User Defined Unit	2.00	86,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Phase II construction

Construction Phase - Construction assumed to take place over an approximate 10 month period

Trips and VMT - Trip haul revised based on construction phasing.

Grading - Grading report

On-road Fugitive Dust -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	150.00
tblLandUse	LandUseSquareFeet	320,892.00	290,000.00

tblLandUse	LandUseSquareFeet	0.00	86,000.00
tblLandUse	LotAcreage	7.37	3.00
tblLandUse	LotAcreage	0.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	50.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	210.9629	27.2186	21.4276	0.0502	19.8049	1.2302	21.0350	10.1417	1.1318	11.2734	0.0000	5,005.7844	5,005.7844	1.1971	0.2325	5,091.8099
2025	210.9451	1.2175	2.6324	5.1500e-003	0.2793	0.0530	0.3323	0.0741	0.0529	0.1269	0.0000	508.7644	508.7644	0.0227	7.0400e-003	511.4313
Maximum	**210.9629**	**27.2186**	**21.4276**	**0.0502**	**19.8049**	**1.2302**	**21.0350**	**10.1417**	**1.1318**	**11.2734**	**0.0000**	**5,005.7844**	**5,005.7844**	**1.1971**	**0.2325**	**5,091.8099**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	210.9629	27.2186	21.4276	0.0502	19.8049	1.2302	21.0350	10.1417	1.1318	11.2734	0.0000	5,005.7844	5,005.7844	1.1971	0.2325	5,091.8099
2025	210.9451	1.2175	2.6324	5.1500e-003	0.2793	0.0530	0.3323	0.0741	0.0529	0.1269	0.0000	508.7644	508.7644	0.0227	7.0400e-003	511.4313
Maximum	**210.9629**	**27.2186**	**21.4276**	**0.0502**	**19.8049**	**1.2302**	**21.0350**	**10.1417**	**1.1318**	**11.2734**	**0.0000**	**5,005.7844**	**5,005.7844**	**1.1971**	**0.2325**	**5,091.8099**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.8031	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Energy	0.5477	4.9792	4.1825	0.0299		0.3784	0.3784		0.3784	0.3784		5,975.0073	5,975.0073	0.1145	0.1095	6,010.5137
Mobile	10.6491	12.7382	88.0063	0.1366	14.1791	0.1360	14.3150	3.7869	0.1273	3.9142		14,134.4158	14,134.4158	1.3298	0.8924	14,433.5988
Total	**20.9998**	**17.7176**	**92.2230**	**0.1665**	**14.1791**	**0.5145**	**14.6936**	**3.7869**	**0.5059**	**4.2927**		**20,109.4964**	**20,109.4964**	**1.4445**	**1.0020**	**20,444.1907**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.8031	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Energy	0.5477	4.9792	4.1825	0.0299		0.3784	0.3784		0.3784	0.3784		5,975.0073	5,975.0073	0.1145	0.1095	6,010.5137
Mobile	10.6491	12.7382	88.0063	0.1366	14.1791	0.1360	14.3150	3.7869	0.1273	3.9142		14,134.4158	14,134.4158	1.3298	0.8924	14,433.5988
Total	**20.9998**	**17.7176**	**92.2230**	**0.1665**	**14.1791**	**0.5145**	**14.6936**	**3.7869**	**0.5059**	**4.2927**		**20,109.4964**	**20,109.4964**	**1.4445**	**1.0020**	**20,444.1907**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/1/2024	2/28/2024	5	20	
2	Site Preparation	Site Preparation	2/29/2024	3/13/2024	5	10	
3	Grading	Grading	3/14/2024	4/10/2024	5	20	
4	Building Construction	Building Construction	4/11/2024	11/6/2024	5	150	
5	Paving	Paving	11/7/2024	12/4/2024	5	20	
6	Architectural Coating	Architectural Coating	12/5/2024	1/1/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 20

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 606,000; Non-Residential Outdoor: 202,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	50.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	170.00	66.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	34.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2437	20.8781	19.7073	0.0388		0.9602	0.9602		0.8922	0.8922		3,747.4228	3,747.4228	1.0485		3,773.6345
Total	**2.2437**	**20.8781**	**19.7073**	**0.0388**		**0.9602**	**0.9602**		**0.8922**	**0.8922**		**3,747.4228**	**3,747.4228**	**1.0485**		**3,773.6345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0536	0.0355	0.3909	1.0000e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		102.7398	102.7398	3.6000e-003	3.3400e-003	103.8259
Total	**0.0536**	**0.0355**	**0.3909**	**1.0000e-003**	**0.1232**	**6.8000e-004**	**0.1239**	**0.0327**	**6.3000e-004**	**0.0333**		**102.7398**	**102.7398**	**3.6000e-003**	**3.3400e-003**	**103.8259**

3.2 Demolition - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2437	20.8781	19.7073	0.0388		0.9602	0.9602		0.8922	0.8922	0.0000	3,747.4228	3,747.4228	1.0485		3,773.6345
Total	**2.2437**	**20.8781**	**19.7073**	**0.0388**		**0.9602**	**0.9602**		**0.8922**	**0.8922**	**0.0000**	**3,747.4228**	**3,747.4228**	**1.0485**		**3,773.6345**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0536	0.0355	0.3909	1.0000e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		102.7398	102.7398	3.6000e-003	3.3400e-003	103.8259
Total	**0.0536**	**0.0355**	**0.3909**	**1.0000e-003**	**0.1232**	**6.8000e-004**	**0.1239**	**0.0327**	**6.3000e-004**	**0.0333**		**102.7398**	**102.7398**	**3.6000e-003**	**3.3400e-003**	**103.8259**

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0643	0.0426	0.4691	1.2000e-003	0.1479	8.1000e-004	0.1487	0.0392	7.5000e-004	0.0400		123.2878	123.2878	4.3200e-003	4.0100e-003	124.5911
Total	**0.0643**	**0.0426**	**0.4691**	**1.2000e-003**	**0.1479**	**8.1000e-004**	**0.1487**	**0.0392**	**7.5000e-004**	**0.0400**		**123.2878**	**123.2878**	**4.3200e-003**	**4.0100e-003**	**124.5911**

3.3 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6570**	**1.2294**	**20.8864**	**10.1025**	**1.1310**	**11.2335**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0643	0.0426	0.4691	1.2000e-003	0.1479	8.1000e-004	0.1487	0.0392	7.5000e-004	0.0400		123.2878	123.2878	4.3200e-003	4.0100e-003	124.5911
Total	**0.0643**	**0.0426**	**0.4691**	**1.2000e-003**	**0.1479**	**8.1000e-004**	**0.1487**	**0.0392**	**7.5000e-004**	**0.0400**		**123.2878**	**123.2878**	**4.3200e-003**	**4.0100e-003**	**124.5911**

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.6617	17.0310	14.7594	0.0297		0.7244	0.7244		0.6665	0.6665		2,873.0541	2,873.0541	0.9292		2,896.2842
Total	**1.6617**	**17.0310**	**14.7594**	**0.0297**	**7.0826**	**0.7244**	**7.8070**	**3.4247**	**0.6665**	**4.0912**		**2,873.0541**	**2,873.0541**	**0.9292**		**2,896.2842**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	5.0400e-003	0.3666	0.0793	1.5200e-003	0.0433	2.5200e-003	0.0458	0.0118	2.4100e-003	0.0142		165.3100	165.3100	4.9300e-003	0.0261	173.2235
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0536	0.0355	0.3909	1.0000e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		102.7398	102.7398	3.6000e-003	3.3400e-003	103.8259
Total	**0.0586**	**0.4021**	**0.4702**	**2.5200e-003**	**0.1665**	**3.2000e-003**	**0.1697**	**0.0445**	**3.0400e-003**	**0.0475**		**268.0498**	**268.0498**	**8.5300e-003**	**0.0295**	**277.0494**

3.4 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.6617	17.0310	14.7594	0.0297		0.7244	0.7244		0.6665	0.6665	0.0000	2,873.0541	2,873.0541	0.9292		2,896.2842
Total	**1.6617**	**17.0310**	**14.7594**	**0.0297**	**7.0826**	**0.7244**	**7.8070**	**3.4247**	**0.6665**	**4.0912**	**0.0000**	**2,873.0541**	**2,873.0541**	**0.9292**		**2,896.2842**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	5.0400e-003	0.3666	0.0793	1.5200e-003	0.0433	2.5200e-003	0.0458	0.0118	2.4100e-003	0.0142		165.3100	165.3100	4.9300e-003	0.0261	173.2235
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0536	0.0355	0.3909	1.0000e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		102.7398	102.7398	3.6000e-003	3.3400e-003	103.8259
Total	**0.0586**	**0.4021**	**0.4702**	**2.5200e-003**	**0.1665**	**3.2000e-003**	**0.1697**	**0.0445**	**3.0400e-003**	**0.0475**		**268.0498**	**268.0498**	**8.5300e-003**	**0.0295**	**277.0494**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.698 9	2,555.698 9	0.6044		2,570.807 7
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.698 9**	**2,555.698 9**	**0.6044**		**2,570.807 7**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0646	2.9396	0.8306	0.0120	0.4023	0.0151	0.4174	0.1157	0.0145	0.1302		1,285.700 7	1,285.700 7	0.0242	0.1947	1,344.308 9
Worker	0.6071	0.4026	4.4302	0.0113	1.3965	7.6900e-003	1.4042	0.3704	7.0900e-003	0.3775		1,164.384 8	1,164.384 8	0.0408	0.0379	1,176.693 3
Total	**0.6717**	**3.3422**	**5.2608**	**0.0233**	**1.7988**	**0.0228**	**1.8216**	**0.4861**	**0.0216**	**0.5077**		**2,450.085 5**	**2,450.085 5**	**0.0650**	**0.2325**	**2,521.002 2**

3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0646	2.9396	0.8306	0.0120	0.4023	0.0151	0.4174	0.1157	0.0145	0.1302		1,285.7007	1,285.7007	0.0242	0.1947	1,344.3089
Worker	0.6071	0.4026	4.4302	0.0113	1.3965	7.6900e-003	1.4042	0.3704	7.0900e-003	0.3775		1,164.3848	1,164.3848	0.0408	0.0379	1,176.6933
Total	**0.6717**	**3.3422**	**5.2608**	**0.0233**	**1.7988**	**0.0228**	**1.8216**	**0.4861**	**0.0216**	**0.5077**		**2,450.0855**	**2,450.0855**	**0.0650**	**0.2325**	**2,521.0022**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.547 2	2,207.547 2	0.7140		2,225.396 3
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.547 2**	**2,207.547 2**	**0.7140**		**2,225.396 3**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0536	0.0355	0.3909	1.0000e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		102.7398	102.7398	3.6000e-003	3.3400e-003	103.8259
Total	**0.0536**	**0.0355**	**0.3909**	**1.0000e-003**	**0.1232**	**6.8000e-004**	**0.1239**	**0.0327**	**6.3000e-004**	**0.0333**		**102.7398**	**102.7398**	**3.6000e-003**	**3.3400e-003**	**103.8259**

3.6 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9882**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0536	0.0355	0.3909	1.0000e-003	0.1232	6.8000e-004	0.1239	0.0327	6.3000e-004	0.0333		102.7398	102.7398	3.6000e-003	3.3400e-003	103.8259
Total	**0.0536**	**0.0355**	**0.3909**	**1.0000e-003**	**0.1232**	**6.8000e-004**	**0.1239**	**0.0327**	**6.3000e-004**	**0.0333**		**102.7398**	**102.7398**	**3.6000e-003**	**3.3400e-003**	**103.8259**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	210.6608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.8443
Total	**210.8415**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.8443**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1214	0.0805	0.8861	2.2600e-003	0.2793	1.5400e-003	0.2808	0.0741	1.4200e-003	0.0755		232.8770	232.8770	8.1600e-003	7.5800e-003	235.3387
Total	**0.1214**	**0.0805**	**0.8861**	**2.2600e-003**	**0.2793**	**1.5400e-003**	**0.2808**	**0.0741**	**1.4200e-003**	**0.0755**		**232.8770**	**232.8770**	**8.1600e-003**	**7.5800e-003**	**235.3387**

3.7 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	210.6608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.8443
Total	**210.8415**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.8443**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1214	0.0805	0.8861	2.2600e-003	0.2793	1.5400e-003	0.2808	0.0741	1.4200e-003	0.0755		232.8770	232.8770	8.1600e-003	7.5800e-003	235.3387
Total	**0.1214**	**0.0805**	**0.8861**	**2.2600e-003**	**0.2793**	**1.5400e-003**	**0.2808**	**0.0741**	**1.4200e-003**	**0.0755**		**232.8770**	**232.8770**	**8.1600e-003**	**7.5800e-003**	**235.3387**

3.7 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	210.6608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**210.8316**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1135	0.0720	0.8232	2.1800e-003	0.2793	1.4600e-003	0.2808	0.0741	1.3500e-003	0.0754		227.3164	227.3164	7.3900e-003	7.0400e-003	229.5994
Total	**0.1135**	**0.0720**	**0.8232**	**2.1800e-003**	**0.2793**	**1.4600e-003**	**0.2808**	**0.0741**	**1.3500e-003**	**0.0754**		**227.3164**	**227.3164**	**7.3900e-003**	**7.0400e-003**	**229.5994**

3.7 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	210.6608					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**210.8316**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1135	0.0720	0.8232	2.1800e-003	0.2793	1.4600e-003	0.2808	0.0741	1.3500e-003	0.0754		227.3164	227.3164	7.3900e-003	7.0400e-003	229.5994
Total	**0.1135**	**0.0720**	**0.8232**	**2.1800e-003**	**0.2793**	**1.4600e-003**	**0.2808**	**0.0741**	**1.3500e-003**	**0.0754**		**227.3164**	**227.3164**	**7.3900e-003**	**7.0400e-003**	**229.5994**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	10.6491	12.7382	88.0063	0.1366	14.1791	0.1360	14.3150	3.7869	0.1273	3.9142		14,134.41 58	14,134.41 58	1.3298	0.8924	14,433.59 88
Unmitigated	10.6491	12.7382	88.0063	0.1366	14.1791	0.1360	14.3150	3.7869	0.1273	3.9142		14,134.41 58	14,134.41 58	1.3298	0.8924	14,433.59 88

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hotel	1,847.56	1,809.99	1314.95	3,548,405	3,548,405
Quality Restaurant	2,347.52	2,521.12	2015.16	2,760,525	2,760,525
User Defined Recreational	0.00	0.00	0.00		
Total	4,195.08	4,331.11	3,330.11	6,308,930	6,308,930

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hotel	14.70	6.60	6.60	19.40	61.60	19.00	58	38	4
Quality Restaurant	14.70	6.60	6.60	12.00	69.00	19.00	38	18	44
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hotel	0.536774	0.058783	0.173424	0.127345	0.036375	0.008877	0.014453	0.006568	0.001093	0.000297	0.030119	0.001546	0.004347
Quality Restaurant	0.536774	0.058783	0.173424	0.127345	0.036375	0.008877	0.014453	0.006568	0.001093	0.000297	0.030119	0.001546	0.004347
User Defined Recreational	0.536774	0.058783	0.173424	0.127345	0.036375	0.008877	0.014453	0.006568	0.001093	0.000297	0.030119	0.001546	0.004347

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.5477	4.9792	4.1825	0.0299		0.3784	0.3784		0.3784	0.3784		5,975.007 3	5,975.007 3	0.1145	0.1095	6,010.513 7
NaturalGas Unmitigated	0.5477	4.9792	4.1825	0.0299		0.3784	0.3784		0.3784	0.3784		5,975.007 3	5,975.007 3	0.1145	0.1095	6,010.513 7

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	34887.4	0.3762	3.4203	2.8731	0.0205		0.2600	0.2600		0.2600	0.2600		4,104.3997	4,104.3997	0.0787	0.0753	4,128.7901
Quality Restaurant	15900.2	0.1715	1.5588	1.3094	9.3500e-003		0.1185	0.1185		0.1185	0.1185		1,870.6076	1,870.6076	0.0359	0.0343	1,881.7237
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.5477**	**4.9792**	**4.1825**	**0.0299**		**0.3784**	**0.3784**		**0.3784**	**0.3784**		**5,975.0073**	**5,975.0073**	**0.1145**	**0.1095**	**6,010.5137**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Hotel	34.8874	0.3762	3.4203	2.8731	0.0205		0.2600	0.2600		0.2600	0.2600		4,104.3997	4,104.3997	0.0787	0.0753	4,128.7901
Quality Restaurant	15.9002	0.1715	1.5588	1.3094	9.3500e-003		0.1185	0.1185		0.1185	0.1185		1,870.6076	1,870.6076	0.0359	0.0343	1,881.7237
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.5477**	**4.9792**	**4.1825**	**0.0299**		**0.3784**	**0.3784**		**0.3784**	**0.3784**		**5,975.0073**	**5,975.0073**	**0.1145**	**0.1095**	**6,010.5137**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.8031	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Unmitigated	9.8031	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1543					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.6456					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.1500e-003	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Total	**9.8031**	**3.1000e-004**	**0.0342**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**		**0.0733**	**0.0733**	**1.9000e-004**		**0.0781**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1543					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.6456					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.1500e-003	3.1000e-004	0.0342	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0733	0.0733	1.9000e-004		0.0781
Total	**9.8031**	**3.1000e-004**	**0.0342**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**		**0.0733**	**0.0733**	**1.9000e-004**		**0.0781**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Graton Casino Expansion Parking Lot

Sonoma-San Francisco County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	1,500.00	Space	5.00	600,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Phase 1 construction

Grading - Grading report

Construction Phase - Parking lot construction assumed to take place over a 7.2 month period.

Trips and VMT - Revised trip hauling based on project phasing.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	230.00	115.00
tblConstructionPhase	NumDays	18.00	10.00
tblConstructionPhase	PhaseEndDate	6/28/2023	6/14/2023
tblConstructionPhase	PhaseEndDate	6/3/2024	12/25/2023

tblConstructionPhase	PhaseEndDate	6/27/2024	1/17/2024
tblConstructionPhase	PhaseEndDate	7/23/2024	1/31/2024
tblConstructionPhase	PhaseStartDate	6/4/2024	12/25/2023
tblConstructionPhase	PhaseStartDate	6/28/2024	1/18/2024
tblLandUse	LotAcreage	13.50	5.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	376.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.5967	27.9412	37.6441	0.0839	19.8049	1.2669	21.0718	10.1417	1.1655	11.3072	0.0000	8,338.428 9	8,338.428 9	1.2749	0.5026	8,474.617 6
2024	25.3810	8.3113	12.7605	0.0204	0.4107	0.3996	0.5639	0.1090	0.3693	0.4129	0.0000	1,951.863 4	1,951.863 4	0.5716	9.6600e-003	1,967.304 9
Maximum	**25.3810**	**27.9412**	**37.6441**	**0.0839**	**19.8049**	**1.2669**	**21.0718**	**10.1417**	**1.1655**	**11.3072**	**0.0000**	**8,338.428 9**	**8,338.428 9**	**1.2749**	**0.5026**	**8,474.617 6**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.5967	27.9412	37.6441	0.0839	19.8049	1.2669	21.0718	10.1417	1.1655	11.3072	0.0000	8,338.428 9	8,338.428 9	1.2749	0.5026	8,474.617 6
2024	25.3810	8.3113	12.7605	0.0204	0.4107	0.3996	0.5639	0.1090	0.3693	0.4129	0.0000	1,951.863 4	1,951.863 4	0.5716	9.6600e-003	1,967.304 9
Maximum	**25.3810**	**27.9412**	**37.6441**	**0.0839**	**19.8049**	**1.2669**	**21.0718**	**10.1417**	**1.1655**	**11.3072**	**0.0000**	**8,338.428 9**	**8,338.428 9**	**1.2749**	**0.5026**	**8,474.617 6**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2952	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.2952**	**1.3900e-003**	**0.1529**	**1.0000e-005**	**0.0000**	**5.4000e-004**	**5.4000e-004**	**0.0000**	**5.4000e-004**	**5.4000e-004**		**0.3283**	**0.3283**	**8.6000e-004**	**0.0000**	**0.3497**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2952	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.2952**	**1.3900e-003**	**0.1529**	**1.0000e-005**	**0.0000**	**5.4000e-004**	**5.4000e-004**	**0.0000**	**5.4000e-004**	**5.4000e-004**		**0.3283**	**0.3283**	**8.6000e-004**	**0.0000**	**0.3497**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2023	6/14/2023	5	10	
2	Site Preparation	Site Preparation	6/29/2023	7/5/2023	5	5	
3	Grading	Grading	7/6/2023	7/17/2023	5	8	
4	Building Construction	Building Construction	7/18/2023	12/25/2023	5	115	
5	Paving	Paving	12/25/2023	1/17/2024	5	18	
6	Architectural Coating	Architectural Coating	1/18/2024	1/31/2024	5	10	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 8

Acres of Paving: 5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	376.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	252.00	98.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	50.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2691	21.4844	19.6434	0.0388		0.9975	0.9975		0.9280	0.9280		3,746.9840	3,746.9840	1.0494		3,773.2183
Total	**2.2691**	**21.4844**	**19.6434**	**0.0388**		**0.9975**	**0.9975**		**0.9280**	**0.9280**		**3,746.9840**	**3,746.9840**	**1.0494**		**3,773.2183**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0553	0.0324	0.4398	1.1000e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		112.4693	112.4693	3.5500e-003	3.1400e-003	113.4926
Total	**0.0553**	**0.0324**	**0.4398**	**1.1000e-003**	**0.1232**	**7.2000e-004**	**0.1239**	**0.0327**	**6.6000e-004**	**0.0334**		**112.4693**	**112.4693**	**3.5500e-003**	**3.1400e-003**	**113.4926**

3.2 Demolition - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2691	21.4844	19.6434	0.0388		0.9975	0.9975		0.9280	0.9280	0.0000	3,746.9840	3,746.9840	1.0494		3,773.2183
Total	**2.2691**	**21.4844**	**19.6434**	**0.0388**		**0.9975**	**0.9975**		**0.9280**	**0.9280**	**0.0000**	**3,746.9840**	**3,746.9840**	**1.0494**		**3,773.2183**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0553	0.0324	0.4398	1.1000e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		112.4693	112.4693	3.5500e-003	3.1400e-003	113.4926
Total	**0.0553**	**0.0324**	**0.4398**	**1.1000e-003**	**0.1232**	**7.2000e-004**	**0.1239**	**0.0327**	**6.6000e-004**	**0.0334**		**112.4693**	**112.4693**	**3.5500e-003**	**3.1400e-003**	**113.4926**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6595	27.5242	18.2443	0.0381		1.2660	1.2660		1.1647	1.1647		3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**2.6595**	**27.5242**	**18.2443**	**0.0381**	**19.6570**	**1.2660**	**20.9230**	**10.1025**	**1.1647**	**11.2672**		**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0664	0.0389	0.5278	1.3200e-003	0.1479	8.6000e-004	0.1487	0.0392	8.0000e-004	0.0400		134.9631	134.9631	4.2600e-003	3.7600e-003	136.1911
Total	**0.0664**	**0.0389**	**0.5278**	**1.3200e-003**	**0.1479**	**8.6000e-004**	**0.1487**	**0.0392**	**8.0000e-004**	**0.0400**		**134.9631**	**134.9631**	**4.2600e-003**	**3.7600e-003**	**136.1911**

3.3 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6595	27.5242	18.2443	0.0381		1.2660	1.2660		1.1647	1.1647	0.0000	3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**2.6595**	**27.5242**	**18.2443**	**0.0381**	**19.6570**	**1.2660**	**20.9230**	**10.1025**	**1.1647**	**11.2672**	**0.0000**	**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0664	0.0389	0.5278	1.3200e-003	0.1479	8.6000e-004	0.1487	0.0392	8.0000e-004	0.0400		134.9631	134.9631	4.2600e-003	3.7600e-003	136.1911
Total	**0.0664**	**0.0389**	**0.5278**	**1.3200e-003**	**0.1479**	**8.6000e-004**	**0.1487**	**0.0392**	**8.0000e-004**	**0.0400**		**134.9631**	**134.9631**	**4.2600e-003**	**3.7600e-003**	**136.1911**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.7109	17.9359	14.7507	0.0297		0.7749	0.7749		0.7129	0.7129		2,872.6910	2,872.6910	0.9291		2,895.9182
Total	**1.7109**	**17.9359**	**14.7507**	**0.0297**	**7.0826**	**0.7749**	**7.8575**	**3.4247**	**0.7129**	**4.1377**		**2,872.6910**	**2,872.6910**	**0.9291**		**2,895.9182**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1023	6.6356	1.4874	0.0292	0.8137	0.0476	0.8613	0.2223	0.0455	0.2678		3,160.5300	3,160.5300	0.0903	0.4995	3,311.6346
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0553	0.0324	0.4398	1.1000e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		112.4693	112.4693	3.5500e-003	3.1400e-003	113.4926
Total	**0.1576**	**6.6680**	**1.9273**	**0.0303**	**0.9369**	**0.0483**	**0.9852**	**0.2550**	**0.0462**	**0.3012**		**3,272.9993**	**3,272.9993**	**0.0938**	**0.5026**	**3,425.1271**

3.4 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.7109	17.9359	14.7507	0.0297		0.7749	0.7749		0.7129	0.7129	0.0000	2,872.6910	2,872.6910	0.9291		2,895.9182
Total	**1.7109**	**17.9359**	**14.7507**	**0.0297**	**7.0826**	**0.7749**	**7.8575**	**3.4247**	**0.7129**	**4.1377**	**0.0000**	**2,872.6910**	**2,872.6910**	**0.9291**		**2,895.9182**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1023	6.6356	1.4874	0.0292	0.8137	0.0476	0.8613	0.2223	0.0455	0.2678		3,160.5300	3,160.5300	0.0903	0.4995	3,311.6346
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0553	0.0324	0.4398	1.1000e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		112.4693	112.4693	3.5500e-003	3.1400e-003	113.4926
Total	**0.1576**	**6.6680**	**1.9273**	**0.0303**	**0.9369**	**0.0483**	**0.9852**	**0.2550**	**0.0462**	**0.3012**		**3,272.9993**	**3,272.9993**	**0.0938**	**0.5026**	**3,425.1271**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1028	4.1783	1.2339	0.0181	0.5974	0.0225	0.6199	0.1718	0.0215	0.1933		1,938.3459	1,938.3459	0.0355	0.2932	2,026.6010
Worker	0.9292	0.5445	7.3893	0.0185	2.0701	0.0121	2.0822	0.5491	0.0112	0.5602		1,889.4836	1,889.4836	0.0596	0.0527	1,906.6749
Total	**1.0321**	**4.7228**	**8.6232**	**0.0366**	**2.6675**	**0.0346**	**2.7021**	**0.7209**	**0.0327**	**0.7536**		**3,827.8295**	**3,827.8295**	**0.0951**	**0.3459**	**3,933.2759**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1028	4.1783	1.2339	0.0181	0.5974	0.0225	0.6199	0.1718	0.0215	0.1933		1,938.3459	1,938.3459	0.0355	0.2932	2,026.6010
Worker	0.9292	0.5445	7.3893	0.0185	2.0701	0.0121	2.0822	0.5491	0.0112	0.5602		1,889.4836	1,889.4836	0.0596	0.0527	1,906.6749
Total	**1.0321**	**4.7228**	**8.6232**	**0.0366**	**2.6675**	**0.0346**	**2.7021**	**0.7209**	**0.0327**	**0.7536**		**3,827.8295**	**3,827.8295**	**0.0951**	**0.3459**	**3,933.2759**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9181	8.7903	12.1905	0.0189		0.4357	0.4357		0.4025	0.4025		1,805.4304	1,805.4304	0.5673		1,819.6122
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9181**	**8.7903**	**12.1905**	**0.0189**		**0.4357**	**0.4357**		**0.4025**	**0.4025**		**1,805.4304**	**1,805.4304**	**0.5673**		**1,819.6122**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0738	0.0432	0.5865	1.4700e-003	0.1643	9.6000e-004	0.1653	0.0436	8.8000e-004	0.0445		149.9590	149.9590	4.7300e-003	4.1800e-003	151.3234
Total	**0.0738**	**0.0432**	**0.5865**	**1.4700e-003**	**0.1643**	**9.6000e-004**	**0.1653**	**0.0436**	**8.8000e-004**	**0.0445**		**149.9590**	**149.9590**	**4.7300e-003**	**4.1800e-003**	**151.3234**

3.6 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9181	8.7903	12.1905	0.0189		0.4357	0.4357		0.4025	0.4025	0.0000	1,805.4304	1,805.4304	0.5673		1,819.6122
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9181**	**8.7903**	**12.1905**	**0.0189**		**0.4357**	**0.4357**		**0.4025**	**0.4025**	**0.0000**	**1,805.4304**	**1,805.4304**	**0.5673**		**1,819.6122**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0738	0.0432	0.5865	1.4700e-003	0.1643	9.6000e-004	0.1653	0.0436	8.8000e-004	0.0445		149.9590	149.9590	4.7300e-003	4.1800e-003	151.3234
Total	**0.0738**	**0.0432**	**0.5865**	**1.4700e-003**	**0.1643**	**9.6000e-004**	**0.1653**	**0.0436**	**8.8000e-004**	**0.0445**		**149.9590**	**149.9590**	**4.7300e-003**	**4.1800e-003**	**151.3234**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8814	8.2730	12.2210	0.0189		0.3987	0.3987		0.3685	0.3685		1,805.6205	1,805.6205	0.5673		1,819.8039
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8814**	**8.2730**	**12.2210**	**0.0189**		**0.3987**	**0.3987**		**0.3685**	**0.3685**		**1,805.6205**	**1,805.6205**	**0.5673**		**1,819.8039**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0685	0.0383	0.5395	1.4200e-003	0.1643	9.0000e-004	0.1652	0.0436	8.3000e-004	0.0444		146.2429	146.2429	4.2600e-003	3.8600e-003	147.5010
Total	**0.0685**	**0.0383**	**0.5395**	**1.4200e-003**	**0.1643**	**9.0000e-004**	**0.1652**	**0.0436**	**8.3000e-004**	**0.0444**		**146.2429**	**146.2429**	**4.2600e-003**	**3.8600e-003**	**147.5010**

3.6 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8814	8.2730	12.2210	0.0189		0.3987	0.3987		0.3685	0.3685	0.0000	1,805.6205	1,805.6205	0.5673		1,819.8039
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8814**	**8.2730**	**12.2210**	**0.0189**		**0.3987**	**0.3987**		**0.3685**	**0.3685**	**0.0000**	**1,805.6205**	**1,805.6205**	**0.5673**		**1,819.8039**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0685	0.0383	0.5395	1.4200e-003	0.1643	9.0000e-004	0.1652	0.0436	8.3000e-004	0.0444		146.2429	146.2429	4.2600e-003	3.8600e-003	147.5010
Total	**0.0685**	**0.0383**	**0.5395**	**1.4200e-003**	**0.1643**	**9.0000e-004**	**0.1652**	**0.0436**	**8.3000e-004**	**0.0444**		**146.2429**	**146.2429**	**4.2600e-003**	**3.8600e-003**	**147.5010**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	25.0290					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.8443
Total	**25.2098**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.8443**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1713	0.0958	1.3488	3.5400e-003	0.4107	2.2600e-003	0.4130	0.1090	2.0800e-003	0.1110		365.6073	365.6073	0.0106	9.6600e-003	368.7525
Total	**0.1713**	**0.0958**	**1.3488**	**3.5400e-003**	**0.4107**	**2.2600e-003**	**0.4130**	**0.1090**	**2.0800e-003**	**0.1110**		**365.6073**	**365.6073**	**0.0106**	**9.6600e-003**	**368.7525**

3.7 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	25.0290					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.8443
Total	**25.2098**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.8443**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1713	0.0958	1.3488	3.5400e-003	0.4107	2.2600e-003	0.4130	0.1090	2.0800e-003	0.1110		365.6073	365.6073	0.0106	9.6600e-003	368.7525
Total	**0.1713**	**0.0958**	**1.3488**	**3.5400e-003**	**0.4107**	**2.2600e-003**	**0.4130**	**0.1090**	**2.0800e-003**	**0.1110**		**365.6073**	**365.6073**	**0.0106**	**9.6600e-003**	**368.7525**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Enclosed Parking with Elevator	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking with Elevator	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.536774	0.058783	0.173424	0.127345	0.036375	0.008877	0.014453	0.006568	0.001093	0.000297	0.030119	0.001546	0.004347

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2952	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Unmitigated	0.2952	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0686					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2125					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0141	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Total	**0.2952**	**1.3900e-003**	**0.1529**	**1.0000e-005**		**5.4000e-004**	**5.4000e-004**		**5.4000e-004**	**5.4000e-004**		**0.3283**	**0.3283**	**8.6000e-004**		**0.3497**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0686					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2125					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0141	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Total	**0.2952**	**1.3900e-003**	**0.1529**	**1.0000e-005**		**5.4000e-004**	**5.4000e-004**		**5.4000e-004**	**5.4000e-004**		**0.3283**	**0.3283**	**8.6000e-004**		**0.3497**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Graton Casino Expansion Parking Lot

Sonoma-San Francisco County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	1,500.00	Space	5.00	600,000.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2024

Utility Company Pacific Gas and Electric Company

CO2 Intensity (lb/MWhr) 203.98 **CH4 Intensity (lb/MWhr)** 0.033 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Phase 1 construction

Grading - Grading report

Construction Phase - Parking lot construction assumed to take place over a 7.2 month period.

Trips and VMT - Revised trip hauling based on project phasing.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	230.00	115.00
tblConstructionPhase	NumDays	18.00	10.00
tblConstructionPhase	PhaseEndDate	6/28/2023	6/14/2023
tblConstructionPhase	PhaseEndDate	6/3/2024	12/25/2023

tblConstructionPhase	PhaseEndDate	6/27/2024	1/17/2024
tblConstructionPhase	PhaseEndDate	7/23/2024	1/31/2024
tblConstructionPhase	PhaseStartDate	6/4/2024	12/25/2023
tblConstructionPhase	PhaseStartDate	6/28/2024	1/18/2024
tblLandUse	LotAcreage	13.50	5.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	376.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.6344	28.3052	37.3844	0.0827	19.8049	1.2669	21.0718	10.1417	1.1655	11.3072	0.0000	8,211.3937	8,211.3937	1.2827	0.5036	8,350.5756
2024	25.3883	8.3204	12.7422	0.0203	0.4107	0.3996	0.5639	0.1090	0.3693	0.4129	0.0000	1,942.6070	1,942.6070	0.5721	0.0111	1,958.2384
Maximum	**25.3883**	**28.3052**	**37.3844**	**0.0827**	**19.8049**	**1.2669**	**21.0718**	**10.1417**	**1.1655**	**11.3072**	**0.0000**	**8,211.3937**	**8,211.3937**	**1.2827**	**0.5036**	**8,350.5756**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.6344	28.3052	37.3844	0.0827	19.8049	1.2669	21.0718	10.1417	1.1655	11.3072	0.0000	8,211.3937	8,211.3937	1.2827	0.5036	8,350.5755
2024	25.3883	8.3204	12.7422	0.0203	0.4107	0.3996	0.5639	0.1090	0.3693	0.4129	0.0000	1,942.6070	1,942.6070	0.5721	0.0111	1,958.2384
Maximum	**25.3883**	**28.3052**	**37.3844**	**0.0827**	**19.8049**	**1.2669**	**21.0718**	**10.1417**	**1.1655**	**11.3072**	**0.0000**	**8,211.3937**	**8,211.3937**	**1.2827**	**0.5036**	**8,350.5755**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2952	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.2952**	**1.3900e-003**	**0.1529**	**1.0000e-005**	**0.0000**	**5.4000e-004**	**5.4000e-004**	**0.0000**	**5.4000e-004**	**5.4000e-004**		**0.3283**	**0.3283**	**8.6000e-004**	**0.0000**	**0.3497**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2952	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.2952**	**1.3900e-003**	**0.1529**	**1.0000e-005**	**0.0000**	**5.4000e-004**	**5.4000e-004**	**0.0000**	**5.4000e-004**	**5.4000e-004**		**0.3283**	**0.3283**	**8.6000e-004**	**0.0000**	**0.3497**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2023	6/14/2023	5	10	
2	Site Preparation	Site Preparation	6/29/2023	7/5/2023	5	5	
3	Grading	Grading	7/6/2023	7/17/2023	5	8	
4	Building Construction	Building Construction	7/18/2023	12/25/2023	5	115	
5	Paving	Paving	12/25/2023	1/17/2024	5	18	
6	Architectural Coating	Architectural Coating	1/18/2024	1/31/2024	5	10	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 8

Acres of Paving: 5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	376.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	252.00	98.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	50.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2691	21.4844	19.6434	0.0388		0.9975	0.9975		0.9280	0.9280		3,746.9840	3,746.9840	1.0494		3,773.2183
Total	**2.2691**	**21.4844**	**19.6434**	**0.0388**		**0.9975**	**0.9975**		**0.9280**	**0.9280**		**3,746.9840**	**3,746.9840**	**1.0494**		**3,773.2183**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0575	0.0401	0.4235	1.0300e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		105.3351	105.3351	3.9900e-003	3.6200e-003	106.5130
Total	**0.0575**	**0.0401**	**0.4235**	**1.0300e-003**	**0.1232**	**7.2000e-004**	**0.1239**	**0.0327**	**6.6000e-004**	**0.0334**		**105.3351**	**105.3351**	**3.9900e-003**	**3.6200e-003**	**106.5130**

3.2 Demolition - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2691	21.4844	19.6434	0.0388		0.9975	0.9975		0.9280	0.9280	0.0000	3,746.9840	3,746.9840	1.0494		3,773.2183
Total	**2.2691**	**21.4844**	**19.6434**	**0.0388**		**0.9975**	**0.9975**		**0.9280**	**0.9280**	**0.0000**	**3,746.9840**	**3,746.9840**	**1.0494**		**3,773.2183**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0575	0.0401	0.4235	1.0300e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		105.3351	105.3351	3.9900e-003	3.6200e-003	106.5130
Total	**0.0575**	**0.0401**	**0.4235**	**1.0300e-003**	**0.1232**	**7.2000e-004**	**0.1239**	**0.0327**	**6.6000e-004**	**0.0334**		**105.3351**	**105.3351**	**3.9900e-003**	**3.6200e-003**	**106.5130**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6595	27.5242	18.2443	0.0381		1.2660	1.2660		1.1647	1.1647		3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**2.6595**	**27.5242**	**18.2443**	**0.0381**	**19.6570**	**1.2660**	**20.9230**	**10.1025**	**1.1647**	**11.2672**		**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0690	0.0481	0.5082	1.2300e-003	0.1479	8.6000e-004	0.1487	0.0392	8.0000e-004	0.0400		126.4021	126.4021	4.7900e-003	4.3400e-003	127.8155
Total	**0.0690**	**0.0481**	**0.5082**	**1.2300e-003**	**0.1479**	**8.6000e-004**	**0.1487**	**0.0392**	**8.0000e-004**	**0.0400**		**126.4021**	**126.4021**	**4.7900e-003**	**4.3400e-003**	**127.8155**

3.3 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6595	27.5242	18.2443	0.0381		1.2660	1.2660		1.1647	1.1647	0.0000	3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**2.6595**	**27.5242**	**18.2443**	**0.0381**	**19.6570**	**1.2660**	**20.9230**	**10.1025**	**1.1647**	**11.2672**	**0.0000**	**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0690	0.0481	0.5082	1.2300e-003	0.1479	8.6000e-004	0.1487	0.0392	8.0000e-004	0.0400		126.4021	126.4021	4.7900e-003	4.3400e-003	127.8155
Total	**0.0690**	**0.0481**	**0.5082**	**1.2300e-003**	**0.1479**	**8.6000e-004**	**0.1487**	**0.0392**	**8.0000e-004**	**0.0400**		**126.4021**	**126.4021**	**4.7900e-003**	**4.3400e-003**	**127.8155**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.7109	17.9359	14.7507	0.0297		0.7749	0.7749		0.7129	0.7129		2,872.6910	2,872.6910	0.9291		2,895.9182
Total	**1.7109**	**17.9359**	**14.7507**	**0.0297**	**7.0826**	**0.7749**	**7.8575**	**3.4247**	**0.7129**	**4.1377**		**2,872.6910**	**2,872.6910**	**0.9291**		**2,895.9182**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0971	6.9952	1.4950	0.0292	0.8137	0.0477	0.8614	0.2223	0.0456	0.2679		3,162.7170	3,162.7170	0.0900	0.4999	3,313.9455
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0575	0.0401	0.4235	1.0300e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		105.3351	105.3351	3.9900e-003	3.6200e-003	106.5130
Total	**0.1546**	**7.0352**	**1.9186**	**0.0302**	**0.9369**	**0.0484**	**0.9853**	**0.2550**	**0.0463**	**0.3013**		**3,268.0521**	**3,268.0521**	**0.0940**	**0.5036**	**3,420.4584**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.7109	17.9359	14.7507	0.0297		0.7749	0.7749		0.7129	0.7129	0.0000	2,872.6910	2,872.6910	0.9291		2,895.9182
Total	**1.7109**	**17.9359**	**14.7507**	**0.0297**	**7.0826**	**0.7749**	**7.8575**	**3.4247**	**0.7129**	**4.1377**	**0.0000**	**2,872.6910**	**2,872.6910**	**0.9291**		**2,895.9182**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0971	6.9952	1.4950	0.0292	0.8137	0.0477	0.8614	0.2223	0.0456	0.2679		3,162.7170	3,162.7170	0.0900	0.4999	3,313.9455
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0575	0.0401	0.4235	1.0300e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0334		105.3351	105.3351	3.9900e-003	3.6200e-003	106.5130
Total	**0.1546**	**7.0352**	**1.9186**	**0.0302**	**0.9369**	**0.0484**	**0.9853**	**0.2550**	**0.0463**	**0.3013**		**3,268.0521**	**3,268.0521**	**0.0940**	**0.5036**	**3,420.4584**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1006	4.4033	1.2701	0.0181	0.5974	0.0226	0.6200	0.1718	0.0216	0.1934		1,940.6771	1,940.6771	0.0352	0.2938	2,029.1225
Worker	0.9663	0.6733	7.1152	0.0173	2.0701	0.0121	2.0822	0.5491	0.0112	0.5602		1,769.6295	1,769.6295	0.0670	0.0608	1,789.4175
Total	**1.0669**	**5.0766**	**8.3852**	**0.0354**	**2.6675**	**0.0347**	**2.7023**	**0.7209**	**0.0328**	**0.7537**		**3,710.3066**	**3,710.3066**	**0.1022**	**0.3546**	**3,818.5400**

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1006	4.4033	1.2701	0.0181	0.5974	0.0226	0.6200	0.1718	0.0216	0.1934		1,940.6771	1,940.6771	0.0352	0.2938	2,029.1225
Worker	0.9663	0.6733	7.1152	0.0173	2.0701	0.0121	2.0822	0.5491	0.0112	0.5602		1,769.6295	1,769.6295	0.0670	0.0608	1,789.4175
Total	**1.0669**	**5.0766**	**8.3852**	**0.0354**	**2.6675**	**0.0347**	**2.7023**	**0.7209**	**0.0328**	**0.7537**		**3,710.3066**	**3,710.3066**	**0.1022**	**0.3546**	**3,818.5400**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9181	8.7903	12.1905	0.0189		0.4357	0.4357		0.4025	0.4025		1,805.4304	1,805.4304	0.5673		1,819.6122
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9181**	**8.7903**	**12.1905**	**0.0189**		**0.4357**	**0.4357**		**0.4025**	**0.4025**		**1,805.4304**	**1,805.4304**	**0.5673**		**1,819.6122**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0767	0.0534	0.5647	1.3700e-003	0.1643	9.6000e-004	0.1653	0.0436	8.8000e-004	0.0445		140.4468	140.4468	5.3200e-003	4.8200e-003	142.0173
Total	**0.0767**	**0.0534**	**0.5647**	**1.3700e-003**	**0.1643**	**9.6000e-004**	**0.1653**	**0.0436**	**8.8000e-004**	**0.0445**		**140.4468**	**140.4468**	**5.3200e-003**	**4.8200e-003**	**142.0173**

3.6 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9181	8.7903	12.1905	0.0189		0.4357	0.4357		0.4025	0.4025	0.0000	1,805.4304	1,805.4304	0.5673		1,819.6122
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9181**	**8.7903**	**12.1905**	**0.0189**		**0.4357**	**0.4357**		**0.4025**	**0.4025**	**0.0000**	**1,805.4304**	**1,805.4304**	**0.5673**		**1,819.6122**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0767	0.0534	0.5647	1.3700e-003	0.1643	9.6000e-004	0.1653	0.0436	8.8000e-004	0.0445		140.4468	140.4468	5.3200e-003	4.8200e-003	142.0173
Total	**0.0767**	**0.0534**	**0.5647**	**1.3700e-003**	**0.1643**	**9.6000e-004**	**0.1653**	**0.0436**	**8.8000e-004**	**0.0445**		**140.4468**	**140.4468**	**5.3200e-003**	**4.8200e-003**	**142.0173**

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8814	8.2730	12.2210	0.0189		0.3987	0.3987		0.3685	0.3685		1,805.6205	1,805.6205	0.5673		1,819.8039
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8814**	**8.2730**	**12.2210**	**0.0189**		**0.3987**	**0.3987**		**0.3685**	**0.3685**		**1,805.6205**	**1,805.6205**	**0.5673**		**1,819.8039**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0714	0.0474	0.5212	1.3300e-003	0.1643	9.0000e-004	0.1652	0.0436	8.3000e-004	0.0444		136.9865	136.9865	4.8000e-003	4.4600e-003	138.4345
Total	**0.0714**	**0.0474**	**0.5212**	**1.3300e-003**	**0.1643**	**9.0000e-004**	**0.1652**	**0.0436**	**8.3000e-004**	**0.0444**		**136.9865**	**136.9865**	**4.8000e-003**	**4.4600e-003**	**138.4345**

3.6 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8814	8.2730	12.2210	0.0189		0.3987	0.3987		0.3685	0.3685	0.0000	1,805.6205	1,805.6205	0.5673		1,819.8039
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8814**	**8.2730**	**12.2210**	**0.0189**		**0.3987**	**0.3987**		**0.3685**	**0.3685**	**0.0000**	**1,805.6205**	**1,805.6205**	**0.5673**		**1,819.8039**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0714	0.0474	0.5212	1.3300e-003	0.1643	9.0000e-004	0.1652	0.0436	8.3000e-004	0.0444		136.9865	136.9865	4.8000e-003	4.4600e-003	138.4345
Total	**0.0714**	**0.0474**	**0.5212**	**1.3300e-003**	**0.1643**	**9.0000e-004**	**0.1652**	**0.0436**	**8.3000e-004**	**0.0444**		**136.9865**	**136.9865**	**4.8000e-003**	**4.4600e-003**	**138.4345**

3.7 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	25.0290					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609		281.4481	281.4481	0.0159		281.8443
Total	**25.2098**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**		**281.4481**	**281.4481**	**0.0159**		**281.8443**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1785	0.1184	1.3030	3.3200e-003	0.4107	2.2600e-003	0.4130	0.1090	2.0800e-003	0.1110		342.4661	342.4661	0.0120	0.0111	346.0863
Total	**0.1785**	**0.1184**	**1.3030**	**3.3200e-003**	**0.4107**	**2.2600e-003**	**0.4130**	**0.1090**	**2.0800e-003**	**0.1110**		**342.4661**	**342.4661**	**0.0120**	**0.0111**	**346.0863**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	25.0290					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1808	1.2188	1.8101	2.9700e-003		0.0609	0.0609		0.0609	0.0609	0.0000	281.4481	281.4481	0.0159		281.8443
Total	**25.2098**	**1.2188**	**1.8101**	**2.9700e-003**		**0.0609**	**0.0609**		**0.0609**	**0.0609**	**0.0000**	**281.4481**	**281.4481**	**0.0159**		**281.8443**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1785	0.1184	1.3030	3.3200e-003	0.4107	2.2600e-003	0.4130	0.1090	2.0800e-003	0.1110		342.4661	342.4661	0.0120	0.0111	346.0863
Total	**0.1785**	**0.1184**	**1.3030**	**3.3200e-003**	**0.4107**	**2.2600e-003**	**0.4130**	**0.1090**	**2.0800e-003**	**0.1110**		**342.4661**	**342.4661**	**0.0120**	**0.0111**	**346.0863**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Enclosed Parking with Elevator	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking with Elevator	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.536774	0.058783	0.173424	0.127345	0.036375	0.008877	0.014453	0.006568	0.001093	0.000297	0.030119	0.001546	0.004347

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

Land Use	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2952	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Unmitigated	0.2952	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0686					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2125					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0141	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Total	**0.2952**	**1.3900e-003**	**0.1529**	**1.0000e-005**		**5.4000e-004**	**5.4000e-004**		**5.4000e-004**	**5.4000e-004**		**0.3283**	**0.3283**	**8.6000e-004**		**0.3497**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0686					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2125					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0141	1.3900e-003	0.1529	1.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004		0.3283	0.3283	8.6000e-004		0.3497
Total	**0.2952**	**1.3900e-003**	**0.1529**	**1.0000e-005**		**5.4000e-004**	**5.4000e-004**		**5.4000e-004**	**5.4000e-004**		**0.3283**	**0.3283**	**8.6000e-004**		**0.3497**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Graton Casino Theater

Sonoma-San Francisco County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Movie Theater (No Matinee)	3,500.00	Seat	1.81	78,750.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2026
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Phase III construction

Construction Phase -

Trips and VMT - Trips revised based on phased construction.

Grading - Grading report

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	151.00

2.0 Emissions Summary

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2025	82.3196	17.6012	13.6564	0.0438	7.8181	0.5458	8.3519	3.6250	0.5096	4.1175	0.0000	4,513.6887	4,513.6887	0.7244	0.3888	4,647.6634
Maximum	**82.3196**	**17.6012**	**13.6564**	**0.0438**	**7.8181**	**0.5458**	**8.3519**	**3.6250**	**0.5096**	**4.1175**	**0.0000**	**4,513.6887**	**4,513.6887**	**0.7244**	**0.3888**	**4,647.6634**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2025	82.3196	17.6012	13.6564	0.0438	7.8181	0.5458	8.3519	3.6250	0.5096	4.1175	0.0000	4,513.6887	4,513.6887	0.7244	0.3888	4,647.6634
Maximum	**82.3196**	**17.6012**	**13.6564**	**0.0438**	**7.8181**	**0.5458**	**8.3519**	**3.6250**	**0.5096**	**4.1175**	**0.0000**	**4,513.6887**	**4,513.6887**	**0.7244**	**0.3888**	**4,647.6634**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9431	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Energy	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
Mobile	20.1215	19.2400	139.8035	0.2696	28.6883	0.2441	28.9324	7.6603	0.2285	7.8888		28,285.2218	28,285.2218	1.9451	1.4568	28,767.9857
Total	**22.1255**	**19.7970**	**140.6250**	**0.2729**	**28.6883**	**0.2875**	**28.9757**	**7.6603**	**0.2719**	**7.9322**		**28,950.5083**	**28,950.5083**	**1.9598**	**1.4690**	**29,437.2709**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9431	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Energy	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
Mobile	20.1215	19.2400	139.8035	0.2696	28.6883	0.2441	28.9324	7.6603	0.2285	7.8888		28,285.2218	28,285.2218	1.9451	1.4568	28,767.9857
Total	**22.1255**	**19.7970**	**140.6250**	**0.2729**	**28.6883**	**0.2875**	**28.9757**	**7.6603**	**0.2719**	**7.9322**		**28,950.5083**	**28,950.5083**	**1.9598**	**1.4690**	**29,437.2709**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2025	1/28/2025	5	20	
2	Site Preparation	Site Preparation	1/29/2025	1/30/2025	5	2	
3	Grading	Grading	1/31/2025	2/5/2025	5	4	
4	Building Construction	Building Construction	2/6/2025	11/12/2025	5	200	
5	Paving	Paving	11/13/2025	11/26/2025	5	10	
6	Architectural Coating	Architectural Coating	11/27/2025	12/10/2025	5	10	

Acres of Grading (Site Preparation Phase): 1.88

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 118,125; Non-Residential Outdoor: 39,375; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40

Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	151.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	33.00	13.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3396	12.9057	13.3316	0.0242		0.5452	0.5452		0.5091	0.5091		2,325.7934	2,325.7934	0.5866		2,340.4584
Total	**1.3396**	**12.9057**	**13.3316**	**0.0242**		**0.5452**	**0.5452**		**0.5091**	**0.5091**		**2,325.7934**	**2,325.7934**	**0.5866**		**2,340.4584**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0415	0.0223	0.3248	8.9000e-004	0.1068	5.6000e-004	0.1074	0.0283	5.1000e-004	0.0288		92.7760	92.7760	2.4900e-003	2.3400e-003	93.5344
Total	**0.0415**	**0.0223**	**0.3248**	**8.9000e-004**	**0.1068**	**5.6000e-004**	**0.1074**	**0.0283**	**5.1000e-004**	**0.0288**		**92.7760**	**92.7760**	**2.4900e-003**	**2.3400e-003**	**93.5344**

3.2 Demolition - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3396	12.9057	13.3316	0.0242		0.5452	0.5452		0.5091	0.5091	0.0000	2,325.7934	2,325.7934	0.5866		2,340.4584
Total	**1.3396**	**12.9057**	**13.3316**	**0.0242**		**0.5452**	**0.5452**		**0.5091**	**0.5091**	**0.0000**	**2,325.7934**	**2,325.7934**	**0.5866**		**2,340.4584**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0415	0.0223	0.3248	8.9000e-004	0.1068	5.6000e-004	0.1074	0.0283	5.1000e-004	0.0288		92.7760	92.7760	2.4900e-003	2.3400e-003	93.5344
Total	**0.0415**	**0.0223**	**0.3248**	**8.9000e-004**	**0.1068**	**5.6000e-004**	**0.1074**	**0.0283**	**5.1000e-004**	**0.0288**		**92.7760**	**92.7760**	**2.4900e-003**	**2.3400e-003**	**93.5344**

3.3 Site Preparation - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2662	0.0000	6.2662	3.0041	0.0000	3.0041			0.0000			0.0000
Off-Road	1.0103	10.5940	6.4468	0.0172		0.4192	0.4192		0.3857	0.3857		1,665.885 6	1,665.885 6	0.5388		1,679.355 1
Total	**1.0103**	**10.5940**	**6.4468**	**0.0172**	**6.2662**	**0.4192**	**6.6854**	**3.0041**	**0.3857**	**3.3898**		**1,665.885 6**	**1,665.885 6**	**0.5388**		**1,679.355 1**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0256	0.0137	0.1999	5.5000e-004	0.0657	3.4000e-004	0.0661	0.0174	3.2000e-004	0.0178		57.0929	57.0929	1.5400e-003	1.4400e-003	57.5596
Total	**0.0256**	**0.0137**	**0.1999**	**5.5000e-004**	**0.0657**	**3.4000e-004**	**0.0661**	**0.0174**	**3.2000e-004**	**0.0178**		**57.0929**	**57.0929**	**1.5400e-003**	**1.4400e-003**	**57.5596**

3.3 Site Preparation - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2662	0.0000	6.2662	3.0041	0.0000	3.0041			0.0000			0.0000
Off-Road	1.0103	10.5940	6.4468	0.0172		0.4192	0.4192		0.3857	0.3857	0.0000	1,665.885 6	1,665.885 6	0.5388		1,679.355 1
Total	**1.0103**	**10.5940**	**6.4468**	**0.0172**	**6.2662**	**0.4192**	**6.6854**	**3.0041**	**0.3857**	**3.3898**	**0.0000**	**1,665.885 6**	**1,665.885 6**	**0.5388**		**1,679.355 1**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0256	0.0137	0.1999	5.5000e-004	0.0657	3.4000e-004	0.0661	0.0174	3.2000e-004	0.0178		57.0929	57.0929	1.5400e-003	1.4400e-003	57.5596
Total	**0.0256**	**0.0137**	**0.1999**	**5.5000e-004**	**0.0657**	**3.4000e-004**	**0.0661**	**0.0174**	**3.2000e-004**	**0.0178**		**57.0929**	**57.0929**	**1.5400e-003**	**1.4400e-003**	**57.5596**

3.4 Grading - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.1904	12.4243	8.4937	0.0206		0.4961	0.4961		0.4564	0.4564		1,995.797 5	1,995.797 5	0.6455		2,011.934 5
Total	**1.1904**	**12.4243**	**8.4937**	**0.0206**	**7.0826**	**0.4961**	**7.5787**	**3.4247**	**0.4564**	**3.8811**		**1,995.797 5**	**1,995.797 5**	**0.6455**		**2,011.934 5**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0786	5.1598	1.1842	0.0225	0.6533	0.0373	0.6907	0.1785	0.0357	0.2142		2,446.525 1	2,446.525 1	0.0770	0.3870	2,563.779 4
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0320	0.0171	0.2499	6.8000e-004	0.0822	4.3000e-004	0.0826	0.0218	4.0000e-004	0.0222		71.3661	71.3661	1.9200e-003	1.8000e-003	71.9495
Total	**0.1105**	**5.1769**	**1.4341**	**0.0232**	**0.7355**	**0.0378**	**0.7733**	**0.2003**	**0.0361**	**0.2364**		**2,517.891 2**	**2,517.891 2**	**0.0789**	**0.3888**	**2,635.728 9**

3.4 Grading - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.1904	12.4243	8.4937	0.0206		0.4961	0.4961		0.4564	0.4564	0.0000	1,995.797 5	1,995.797 5	0.6455		2,011.934 5
Total	**1.1904**	**12.4243**	**8.4937**	**0.0206**	**7.0826**	**0.4961**	**7.5787**	**3.4247**	**0.4564**	**3.8811**	**0.0000**	**1,995.797 5**	**1,995.797 5**	**0.6455**		**2,011.934 5**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			
Hauling	0.0786	5.1598	1.1842	0.0225	0.6533	0.0373	0.6907	0.1785	0.0357	0.2142		2,446.525 1	2,446.525 1	0.0770	0.3870	2,563.779 4
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0320	0.0171	0.2499	6.8000e-004	0.0822	4.3000e-004	0.0826	0.0218	4.0000e-004	0.0222		71.3661	71.3661	1.9200e-003	1.8000e-003	71.9495
Total	**0.1105**	**5.1769**	**1.4341**	**0.0232**	**0.7355**	**0.0378**	**0.7733**	**0.2003**	**0.0361**	**0.2364**		**2,517.891 2**	**2,517.891 2**	**0.0789**	**0.3888**	**2,635.728 9**

Graton Casino Theater - Sonoma-San Francisco County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3246	10.4128	12.4393	0.0221		0.3925	0.3925		0.3785	0.3785		2,002.152 4	2,002.152 4	0.3269		2,010.324 8
Total	**1.3246**	**10.4128**	**12.4393**	**0.0221**		**0.3925**	**0.3925**		**0.3785**	**0.3785**		**2,002.152 4**	**2,002.152 4**	**0.3269**		**2,010.324 8**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0126	0.5437	0.1549	2.3200e-003	0.0792	2.9300e-003	0.0822	0.0228	2.8000e-003	0.0256		248.4409	248.4409	4.9000e-003	0.0376	259.7592
Worker	0.1054	0.0565	0.8246	2.2600e-003	0.2711	1.4200e-003	0.2725	0.0719	1.3100e-003	0.0732		235.5082	235.5082	6.3300e-003	5.9300e-003	237.4334
Total	**0.1180**	**0.6001**	**0.9795**	**4.5800e-003**	**0.3503**	**4.3500e-003**	**0.3547**	**0.0947**	**4.1100e-003**	**0.0988**		**483.9491**	**483.9491**	**0.0112**	**0.0435**	**497.1926**

3.5 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3246	10.4128	12.4393	0.0221		0.3925	0.3925		0.3785	0.3785	0.0000	2,002.1524	2,002.1524	0.3269		2,010.3248
Total	**1.3246**	**10.4128**	**12.4393**	**0.0221**		**0.3925**	**0.3925**		**0.3785**	**0.3785**	**0.0000**	**2,002.1524**	**2,002.1524**	**0.3269**		**2,010.3248**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0126	0.5437	0.1549	2.3200e-003	0.0792	2.9300e-003	0.0822	0.0228	2.8000e-003	0.0256		248.4409	248.4409	4.9000e-003	0.0376	259.7592
Worker	0.1054	0.0565	0.8246	2.2600e-003	0.2711	1.4200e-003	0.2725	0.0719	1.3100e-003	0.0732		235.5082	235.5082	6.3300e-003	5.9300e-003	237.4334
Total	**0.1180**	**0.6001**	**0.9795**	**4.5800e-003**	**0.3503**	**4.3500e-003**	**0.3547**	**0.0947**	**4.1100e-003**	**0.0988**		**483.9491**	**483.9491**	**0.0112**	**0.0435**	**497.1926**

3.6 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5732	5.3259	8.7951	0.0136		0.2465	0.2465		0.2276	0.2276		1,297.8096	1,297.8096	0.4114		1,308.0951
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5732**	**5.3259**	**8.7951**	**0.0136**		**0.2465**	**0.2465**		**0.2276**	**0.2276**		**1,297.8096**	**1,297.8096**	**0.4114**		**1,308.0951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0415	0.0223	0.3248	8.9000e-004	0.1068	5.6000e-004	0.1074	0.0283	5.1000e-004	0.0288		92.7760	92.7760	2.4900e-003	2.3400e-003	93.5344
Total	**0.0415**	**0.0223**	**0.3248**	**8.9000e-004**	**0.1068**	**5.6000e-004**	**0.1074**	**0.0283**	**5.1000e-004**	**0.0288**		**92.7760**	**92.7760**	**2.4900e-003**	**2.3400e-003**	**93.5344**

3.6 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5732	5.3259	8.7951	0.0136		0.2465	0.2465		0.2276	0.2276	0.0000	1,297.8096	1,297.8096	0.4114		1,308.0951
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5732**	**5.3259**	**8.7951**	**0.0136**		**0.2465**	**0.2465**		**0.2276**	**0.2276**	**0.0000**	**1,297.8096**	**1,297.8096**	**0.4114**		**1,308.0951**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0415	0.0223	0.3248	8.9000e-004	0.1068	5.6000e-004	0.1074	0.0283	5.1000e-004	0.0288		92.7760	92.7760	2.4900e-003	2.3400e-003	93.5344
Total	**0.0415**	**0.0223**	**0.3248**	**8.9000e-004**	**0.1068**	**5.6000e-004**	**0.1074**	**0.0283**	**5.1000e-004**	**0.0288**		**92.7760**	**92.7760**	**2.4900e-003**	**2.3400e-003**	**93.5344**

3.7 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	82.1264					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**82.2973**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0224	0.0120	0.1749	4.8000e-004	0.0575	3.0000e-004	0.0578	0.0153	2.8000e-004	0.0155		49.9563	49.9563	1.3400e-003	1.2600e-003	50.3647
Total	**0.0224**	**0.0120**	**0.1749**	**4.8000e-004**	**0.0575**	**3.0000e-004**	**0.0578**	**0.0153**	**2.8000e-004**	**0.0155**		**49.9563**	**49.9563**	**1.3400e-003**	**1.2600e-003**	**50.3647**

3.7 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	82.1264					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**82.2973**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0224	0.0120	0.1749	4.8000e-004	0.0575	3.0000e-004	0.0578	0.0153	2.8000e-004	0.0155		49.9563	49.9563	1.3400e-003	1.2600e-003	50.3647
Total	**0.0224**	**0.0120**	**0.1749**	**4.8000e-004**	**0.0575**	**3.0000e-004**	**0.0578**	**0.0153**	**2.8000e-004**	**0.0155**		**49.9563**	**49.9563**	**1.3400e-003**	**1.2600e-003**	**50.3647**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.1215	19.2400	139.8035	0.2696	28.6883	0.2441	28.9324	7.6603	0.2285	7.8888		28,285.2218	28,285.2218	1.9451	1.4568	28,767.9857
Unmitigated	20.1215	19.2400	139.8035	0.2696	28.6883	0.2441	28.9324	7.6603	0.2285	7.8888		28,285.2218	28,285.2218	1.9451	1.4568	28,767.9857

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Movie Theater (No Matinee)	6,160.00	7,840.00	6475.00	11,157,304	11,157,304
Total	6,160.00	7,840.00	6,475.00	11,157,304	11,157,304

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Movie Theater (No Matinee)	14.70	6.60	6.60	1.80	79.20	19.00	66	17	17

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Movie Theater (No Matinee)	0.552996	0.056868	0.169620	0.121608	0.033119	0.008363	0.014999	0.006644	0.001093	0.000289	0.028928	0.001532	0.003941

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
NaturalGas Unmitigated	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Movie Theater (No Matinee)	5648.42	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
Total		**0.0609**	**0.5538**	**0.4652**	**3.3200e-003**		**0.0421**	**0.0421**		**0.0421**	**0.0421**		**664.5206**	**664.5206**	**0.0127**	**0.0122**	**668.4695**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Movie Theater (No Matinee)	5.64842	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
Total		**0.0609**	**0.5538**	**0.4652**	**3.3200e-003**		**0.0421**	**0.0421**		**0.0421**	**0.0421**		**664.5206**	**664.5206**	**0.0127**	**0.0122**	**668.4695**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9431	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Unmitigated	1.9431	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2250					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.6853					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0328	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Total	**1.9431**	**3.2300e-003**	**0.3564**	**3.0000e-005**		**1.2700e-003**	**1.2700e-003**		**1.2700e-003**	**1.2700e-003**		**0.7660**	**0.7660**	**1.9900e-003**		**0.8158**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2250					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.6853					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0328	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Total	**1.9431**	**3.2300e-003**	**0.3564**	**3.0000e-005**		**1.2700e-003**	**1.2700e-003**		**1.2700e-003**	**1.2700e-003**		**0.7660**	**0.7660**	**1.9900e-003**		**0.8158**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Graton Casino Theater

Sonoma-San Francisco County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Movie Theater (No Matinee)	3,500.00	Seat	1.81	78,750.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2026

Utility Company Pacific Gas and Electric Company

CO2 Intensity (lb/MWhr) 203.98 **CH4 Intensity (lb/MWhr)** 0.033 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Phase III construction

Construction Phase -

Trips and VMT - Trips revised based on phased construction.

Grading - Grading report

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	151.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2025	82.3206	17.8862	13.6463	0.0438	7.8181	0.5458	8.3520	3.6250	0.5096	4.1176	0.0000	4,510.9767	4,510.9767	0.7244	0.3894	4,645.1360
Maximum	**82.3206**	**17.8862**	**13.6463**	**0.0438**	**7.8181**	**0.5458**	**8.3520**	**3.6250**	**0.5096**	**4.1176**	**0.0000**	**4,510.9767**	**4,510.9767**	**0.7244**	**0.3894**	**4,645.1360**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2025	82.3206	17.8862	13.6463	0.0438	7.8181	0.5458	8.3520	3.6250	0.5096	4.1176	0.0000	4,510.9767	4,510.9767	0.7244	0.3894	4,645.1360
Maximum	**82.3206**	**17.8862**	**13.6463**	**0.0438**	**7.8181**	**0.5458**	**8.3520**	**3.6250**	**0.5096**	**4.1176**	**0.0000**	**4,510.9767**	**4,510.9767**	**0.7244**	**0.3894**	**4,645.1360**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9431	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Energy	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
Mobile	17.8652	21.7953	154.7607	0.2571	28.6883	0.2443	28.9325	7.6603	0.2287	7.8890		26,974.1306	26,974.1306	2.2446	1.5914	27,504.4935
Total	**19.8692**	**22.3523**	**155.5823**	**0.2605**	**28.6883**	**0.2876**	**28.9759**	**7.6603**	**0.2720**	**7.9323**		**27,639.4172**	**27,639.4172**	**2.2594**	**1.6036**	**28,173.7788**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9431	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Energy	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
Mobile	17.8652	21.7953	154.7607	0.2571	28.6883	0.2443	28.9325	7.6603	0.2287	7.8890		26,974.1306	26,974.1306	2.2446	1.5914	27,504.4935
Total	**19.8692**	**22.3523**	**155.5823**	**0.2605**	**28.6883**	**0.2876**	**28.9759**	**7.6603**	**0.2720**	**7.9323**		**27,639.4172**	**27,639.4172**	**2.2594**	**1.6036**	**28,173.7788**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2025	1/28/2025	5	20	
2	Site Preparation	Site Preparation	1/29/2025	1/30/2025	5	2	
3	Grading	Grading	1/31/2025	2/5/2025	5	4	
4	Building Construction	Building Construction	2/6/2025	11/12/2025	5	200	
5	Paving	Paving	11/13/2025	11/26/2025	5	10	
6	Architectural Coating	Architectural Coating	11/27/2025	12/10/2025	5	10	

Acres of Grading (Site Preparation Phase): 1.88

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 118,125; Non-Residential Outdoor: 39,375; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40

Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	151.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	33.00	13.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3396	12.9057	13.3316	0.0242		0.5452	0.5452		0.5091	0.5091		2,325.793 4	2,325.793 4	0.5866		2,340.458 4
Total	**1.3396**	**12.9057**	**13.3316**	**0.0242**		**0.5452**	**0.5452**		**0.5091**	**0.5091**		**2,325.793 4**	**2,325.793 4**	**0.5866**		**2,340.458 4**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0434	0.0275	0.3148	8.3000e-004	0.1068	5.6000e-004	0.1074	0.0283	5.1000e-004	0.0288		86.9151	86.9151	2.8200e-003	2.6900e-003	87.7880
Total	**0.0434**	**0.0275**	**0.3148**	**8.3000e-004**	**0.1068**	**5.6000e-004**	**0.1074**	**0.0283**	**5.1000e-004**	**0.0288**		**86.9151**	**86.9151**	**2.8200e-003**	**2.6900e-003**	**87.7880**

3.2 Demolition - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3396	12.9057	13.3316	0.0242		0.5452	0.5452		0.5091	0.5091	0.0000	2,325.7934	2,325.7934	0.5866		2,340.4584
Total	**1.3396**	**12.9057**	**13.3316**	**0.0242**		**0.5452**	**0.5452**		**0.5091**	**0.5091**	**0.0000**	**2,325.7934**	**2,325.7934**	**0.5866**		**2,340.4584**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0434	0.0275	0.3148	8.3000e-004	0.1068	5.6000e-004	0.1074	0.0283	5.1000e-004	0.0288		86.9151	86.9151	2.8200e-003	2.6900e-003	87.7880
Total	**0.0434**	**0.0275**	**0.3148**	**8.3000e-004**	**0.1068**	**5.6000e-004**	**0.1074**	**0.0283**	**5.1000e-004**	**0.0288**		**86.9151**	**86.9151**	**2.8200e-003**	**2.6900e-003**	**87.7880**

3.3 Site Preparation - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2662	0.0000	6.2662	3.0041	0.0000	3.0041			0.0000			0.0000
Off-Road	1.0103	10.5940	6.4468	0.0172		0.4192	0.4192		0.3857	0.3857		1,665.8856	1,665.8856	0.5388		1,679.3551
Total	**1.0103**	**10.5940**	**6.4468**	**0.0172**	**6.2662**	**0.4192**	**6.6854**	**3.0041**	**0.3857**	**3.3898**		**1,665.8856**	**1,665.8856**	**0.5388**		**1,679.3551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0267	0.0169	0.1937	5.1000e-004	0.0657	3.4000e-004	0.0661	0.0174	3.2000e-004	0.0178		53.4862	53.4862	1.7400e-003	1.6600e-003	54.0234
Total	**0.0267**	**0.0169**	**0.1937**	**5.1000e-004**	**0.0657**	**3.4000e-004**	**0.0661**	**0.0174**	**3.2000e-004**	**0.0178**		**53.4862**	**53.4862**	**1.7400e-003**	**1.6600e-003**	**54.0234**

3.3 Site Preparation - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2662	0.0000	6.2662	3.0041	0.0000	3.0041			0.0000			0.0000
Off-Road	1.0103	10.5940	6.4468	0.0172		0.4192	0.4192		0.3857	0.3857	0.0000	1,665.885 6	1,665.885 6	0.5388		1,679.355 1
Total	**1.0103**	**10.5940**	**6.4468**	**0.0172**	**6.2662**	**0.4192**	**6.6854**	**3.0041**	**0.3857**	**3.3898**	**0.0000**	**1,665.885 6**	**1,665.885 6**	**0.5388**		**1,679.355 1**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0267	0.0169	0.1937	5.1000e-004	0.0657	3.4000e-004	0.0661	0.0174	3.2000e-004	0.0178		53.4862	53.4862	1.7400e-003	1.6600e-003	54.0234
Total	**0.0267**	**0.0169**	**0.1937**	**5.1000e-004**	**0.0657**	**3.4000e-004**	**0.0661**	**0.0174**	**3.2000e-004**	**0.0178**		**53.4862**	**53.4862**	**1.7400e-003**	**1.6600e-003**	**54.0234**

3.4 Grading - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.1904	12.4243	8.4937	0.0206		0.4961	0.4961		0.4564	0.4564		1,995.7975	1,995.7975	0.6455		2,011.9345
Total	**1.1904**	**12.4243**	**8.4937**	**0.0206**	**7.0826**	**0.4961**	**7.5787**	**3.4247**	**0.4564**	**3.8811**		**1,995.7975**	**1,995.7975**	**0.6455**		**2,011.9345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0744	5.4408	1.1927	0.0225	0.6533	0.0374	0.6908	0.1785	0.0358	0.2143		2,448.3215	2,448.3215	0.0767	0.3874	2,565.6722
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0334	0.0212	0.2421	6.4000e-004	0.0822	4.3000e-004	0.0826	0.0218	4.0000e-004	0.0222		66.8578	66.8578	2.1700e-003	2.0700e-003	67.5292
Total	**0.1078**	**5.4620**	**1.4349**	**0.0232**	**0.7355**	**0.0378**	**0.7733**	**0.2003**	**0.0362**	**0.2365**		**2,515.1792**	**2,515.1792**	**0.0789**	**0.3894**	**2,633.2015**

3.4 Grading - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			0.0000			0.0000
Off-Road	1.1904	12.4243	8.4937	0.0206		0.4961	0.4961		0.4564	0.4564	0.0000	1,995.797 5	1,995.797 5	0.6455		2,011.934 5
Total	**1.1904**	**12.4243**	**8.4937**	**0.0206**	**7.0826**	**0.4961**	**7.5787**	**3.4247**	**0.4564**	**3.8811**	**0.0000**	**1,995.797 5**	**1,995.797 5**	**0.6455**		**2,011.934 5**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0744	5.4408	1.1927	0.0225	0.6533	0.0374	0.6908	0.1785	0.0358	0.2143		2,448.321 5	2,448.321 5	0.0767	0.3874	2,565.672 2
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0334	0.0212	0.2421	6.4000e-004	0.0822	4.3000e-004	0.0826	0.0218	4.0000e-004	0.0222		66.8578	66.8578	2.1700e-003	2.0700e-003	67.5292
Total	**0.1078**	**5.4620**	**1.4349**	**0.0232**	**0.7355**	**0.0378**	**0.7733**	**0.2003**	**0.0362**	**0.2365**		**2,515.179 2**	**2,515.179 2**	**0.0789**	**0.3894**	**2,633.201 5**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3246	10.4128	12.4393	0.0221		0.3925	0.3925		0.3785	0.3785		2,002.1524	2,002.1524	0.3269		2,010.3248
Total	**1.3246**	**10.4128**	**12.4393**	**0.0221**		**0.3925**	**0.3925**		**0.3785**	**0.3785**		**2,002.1524**	**2,002.1524**	**0.3269**		**2,010.3248**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0122	0.5730	0.1597	2.3200e-003	0.0792	2.9400e-003	0.0822	0.0228	2.8100e-003	0.0256		248.7619	248.7619	4.8600e-003	0.0377	260.1036
Worker	0.1101	0.0698	0.7990	2.1200e-003	0.2711	1.4200e-003	0.2725	0.0719	1.3100e-003	0.0732		220.6306	220.6306	7.1700e-003	6.8300e-003	222.8465
Total	**0.1224**	**0.6429**	**0.9587**	**4.4400e-003**	**0.3503**	**4.3600e-003**	**0.3547**	**0.0947**	**4.1200e-003**	**0.0988**		**469.3925**	**469.3925**	**0.0120**	**0.0445**	**482.9501**

3.5 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3246	10.4128	12.4393	0.0221		0.3925	0.3925		0.3785	0.3785	0.0000	2,002.1524	2,002.1524	0.3269		2,010.3248
Total	**1.3246**	**10.4128**	**12.4393**	**0.0221**		**0.3925**	**0.3925**		**0.3785**	**0.3785**	**0.0000**	**2,002.1524**	**2,002.1524**	**0.3269**		**2,010.3248**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0122	0.5730	0.1597	2.3200e-003	0.0792	2.9400e-003	0.0822	0.0228	2.8100e-003	0.0256		248.7619	248.7619	4.8600e-003	0.0377	260.1036
Worker	0.1101	0.0698	0.7990	2.1200e-003	0.2711	1.4200e-003	0.2725	0.0719	1.3100e-003	0.0732		220.6306	220.6306	7.1700e-003	6.8300e-003	222.8465
Total	**0.1224**	**0.6429**	**0.9587**	**4.4400e-003**	**0.3503**	**4.3600e-003**	**0.3547**	**0.0947**	**4.1200e-003**	**0.0988**		**469.3925**	**469.3925**	**0.0120**	**0.0445**	**482.9501**

3.6 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5732	5.3259	8.7951	0.0136		0.2465	0.2465		0.2276	0.2276		1,297.8096	1,297.8096	0.4114		1,308.0951
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5732**	**5.3259**	**8.7951**	**0.0136**		**0.2465**	**0.2465**		**0.2276**	**0.2276**		**1,297.8096**	**1,297.8096**	**0.4114**		**1,308.0951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0434	0.0275	0.3148	8.3000e-004	0.1068	5.6000e-004	0.1074	0.0283	5.1000e-004	0.0288		86.9151	86.9151	2.8200e-003	2.6900e-003	87.7880
Total	**0.0434**	**0.0275**	**0.3148**	**8.3000e-004**	**0.1068**	**5.6000e-004**	**0.1074**	**0.0283**	**5.1000e-004**	**0.0288**		**86.9151**	**86.9151**	**2.8200e-003**	**2.6900e-003**	**87.7880**

3.6 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5732	5.3259	8.7951	0.0136		0.2465	0.2465		0.2276	0.2276	0.0000	1,297.8096	1,297.8096	0.4114		1,308.0951
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5732**	**5.3259**	**8.7951**	**0.0136**		**0.2465**	**0.2465**		**0.2276**	**0.2276**	**0.0000**	**1,297.8096**	**1,297.8096**	**0.4114**		**1,308.0951**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0434	0.0275	0.3148	8.3000e-004	0.1068	5.6000e-004	0.1074	0.0283	5.1000e-004	0.0288		86.9151	86.9151	2.8200e-003	2.6900e-003	87.7880
Total	**0.0434**	**0.0275**	**0.3148**	**8.3000e-004**	**0.1068**	**5.6000e-004**	**0.1074**	**0.0283**	**5.1000e-004**	**0.0288**		**86.9151**	**86.9151**	**2.8200e-003**	**2.6900e-003**	**87.7880**

3.7 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	82.1264					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**82.2973**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0234	0.0148	0.1695	4.5000e-004	0.0575	3.0000e-004	0.0578	0.0153	2.8000e-004	0.0155		46.8004	46.8004	1.5200e-003	1.4500e-003	47.2705
Total	**0.0234**	**0.0148**	**0.1695**	**4.5000e-004**	**0.0575**	**3.0000e-004**	**0.0578**	**0.0153**	**2.8000e-004**	**0.0155**		**46.8004**	**46.8004**	**1.5200e-003**	**1.4500e-003**	**47.2705**

3.7 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	82.1264					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**82.2973**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0234	0.0148	0.1695	4.5000e-004	0.0575	3.0000e-004	0.0578	0.0153	2.8000e-004	0.0155		46.8004	46.8004	1.5200e-003	1.4500e-003	47.2705
Total	**0.0234**	**0.0148**	**0.1695**	**4.5000e-004**	**0.0575**	**3.0000e-004**	**0.0578**	**0.0153**	**2.8000e-004**	**0.0155**		**46.8004**	**46.8004**	**1.5200e-003**	**1.4500e-003**	**47.2705**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	17.8652	21.7953	154.7607	0.2571	28.6883	0.2443	28.9325	7.6603	0.2287	7.8890		26,974.1306	26,974.1306	2.2446	1.5914	27,504.4935
Unmitigated	17.8652	21.7953	154.7607	0.2571	28.6883	0.2443	28.9325	7.6603	0.2287	7.8890		26,974.1306	26,974.1306	2.2446	1.5914	27,504.4935

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Movie Theater (No Matinee)	6,160.00	7,840.00	6475.00	11,157,304	11,157,304
Total	6,160.00	7,840.00	6,475.00	11,157,304	11,157,304

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Movie Theater (No Matinee)	14.70	6.60	6.60	1.80	79.20	19.00	66	17	17

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Movie Theater (No Matinee)	0.552996	0.056868	0.169620	0.121608	0.033119	0.008363	0.014999	0.006644	0.001093	0.000289	0.028928	0.001532	0.003941

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
NaturalGas Unmitigated	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Movie Theater (No Matinee)	5648.42	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
Total		**0.0609**	**0.5538**	**0.4652**	**3.3200e-003**		**0.0421**	**0.0421**		**0.0421**	**0.0421**		**664.5206**	**664.5206**	**0.0127**	**0.0122**	**668.4695**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Movie Theater (No Matinee)	5.64842	0.0609	0.5538	0.4652	3.3200e-003		0.0421	0.0421		0.0421	0.0421		664.5206	664.5206	0.0127	0.0122	668.4695
Total		**0.0609**	**0.5538**	**0.4652**	**3.3200e-003**		**0.0421**	**0.0421**		**0.0421**	**0.0421**		**664.5206**	**664.5206**	**0.0127**	**0.0122**	**668.4695**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9431	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Unmitigated	1.9431	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2250					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.6853					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0328	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Total	**1.9431**	**3.2300e-003**	**0.3564**	**3.0000e-005**		**1.2700e-003**	**1.2700e-003**		**1.2700e-003**	**1.2700e-003**		**0.7660**	**0.7660**	**1.9900e-003**		**0.8158**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2250					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.6853					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0328	3.2300e-003	0.3564	3.0000e-005		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003		0.7660	0.7660	1.9900e-003		0.8158
Total	**1.9431**	**3.2300e-003**	**0.3564**	**3.0000e-005**		**1.2700e-003**	**1.2700e-003**		**1.2700e-003**	**1.2700e-003**		**0.7660**	**0.7660**	**1.9900e-003**		**0.8158**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX G

TRAFFIC IMPACT STUDY

Traffic Impact Study

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Prepared by:
Abrams Associates
1875 Olympic Boulevard, Suite 210
Walnut Creek CA 94596

Abrams Associates
TRAFFIC ENGINEERING, INC.

March 29, 2023

Graton Resort & Casino Expansion Project

Sonoma County

TRAFFIC IMPACT STUDY

---

1) INTRODUCTION

This traffic impact study describes the existing and future conditions for transportation with and without the proposed expansion of the existing Graton Resort and Casino in Sonoma County. The project would include the following traffic-generating components which would be constructed on the Tribe's Reservation, which is currently held in federal trust:

1) An expansion to the existing casino floor to accommodate up to 3,000 additional gaming positions.
2) An expansion to the existing hotel to provide an additional 221 guest rooms.
3) A 97,000 square foot theater with up to 3,500 seats.
4) A new parking structure with 1,494 standard parking spaces and 54 bus parking spaces.
5) A new rooftop restaurant with 9,700 square feet of space.

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 Sonoma County, the City of Rohnert Park, 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 **Project VMT: The VMT per employee generated by the project would be greater than 85% of the countywide average VMT per employee in Sonoma County, resulting in a significant impact for the project. (Significant and Unavoidable)**

The effectiveness of TDM measures for land use projects in the project area is difficult to quantify as the literature documenting the effectiveness of various mitigations indicate the maximum VMT reduction associated with the implementation of TDM strategies would not be expected to be more than 25 percent.[1] Even this reduction may be difficult to achieve given the project site's limited access to transit services. The requirement to reduce daily VMT by 50 percent in the near-term generally exceeds the expected level of VMT reduction supported by the research.

Mitigation Measure

MM 1 Preparation of a Transportation Demand Management (TDM) Plan, parallel to TDM requirements set forth by the Sonoma County Transportation Authority (SCTA).

Impact #2 Impacts to intersection operations - The project would contribute to LOS operations exceeding the established standards at the following six intersections under future Friday conditions with a full capacity event in the theater:

Wilfred Avenue at Langner Avenue (Intersection #2)
Golf Course Drive at Labath Avenue (Intersection #3)
Golf Course Drive at Redwood Drive (Intersection #4)
Golf Course Drive at the U.S. 101 Southbound Ramps (Intersection #5)
Golf Course Drive at Commerce Boulevard (Intersection #6)
Commerce Boulevard at the U.S. 101 Northbound Ramps (Intersection #7)

The addition of traffic from the proposed project would contribute to these two intersections exceeding the established LOS standards. Please note that one of the impacted intersections (Intersection #5) is within the City of Rohnert Park. The impacts at this intersection involve mitigations that cannot be guaranteed to be feasible and/or acceptable to the City of Rohnert Park. Therefore, the impacts at this intersection (which occur under special event conditions only) would be considered significant and unavoidable. At Golf Course Drive and Labath Avenue (Intersection #3) the following mitigation measure would be forecast to reduce the impacts to a less-than-significant level in all plus project scenarios.

[1] *Quantifying Greenhouse Gas Mitigation Measures*, California Air Pollution Control Officers Association, Sacramento, CA, August, 2010.

Mitigation Measures

MM 2 (a) *Wilfred Avenue at Langner Avenue – Implement manual traffic control for special events.*

MM 2 (b) *Golf Course Drive at Labath Avenue – Widening of Golf Course Drive to allow for a dual westbound left turn movement. Implement manual traffic control for special events.*

MM 2 (c) *Golf Course Drive at Redwood Drive – Restripe the eastbound right-turn lane to create an additional shared through/right lane. Construct a westbound right-turn pocket along a portion of the gas station frontage.*

MM 2 (d) *Golf Course Drive at the U.S. 101 Southbound Ramps – Add a second southbound right turn lane*

MM 2 (e) *Golf Course Drive at Commerce Boulevard – Monitor and adjust signal systems on Golf Course Drive. Upgrade signal timing capabilities to accommodate special event traffic.*

MM 2 (f) *Commerce Boulevard at the U.S. 101 Northbound Ramps – Increase left turn storage on the off-ramp.*

2) PROJECT DESCRIPTION

As noted above, the project would include the following traffic-generating components:

1) An expansion to the existing casino floor to accommodate up to 3,000 additional gaming positions.
2) An expansion to the existing hotel to provide an additional 221 guest rooms.
3) A 97,000 square foot theater with up to 3,500 seats.
4) A new parking structure with 1,494 standard parking spaces and 54 bus parking spaces.
5) A new rooftop restaurant with 9,700 square feet of space.

Figure 1 shows the project location and the surrounding roadway network. **Figures 2** presents the site plan for the project.

FIGURE 1 | PROJECT LOCATION AND STUDY INTERSECTIONS

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

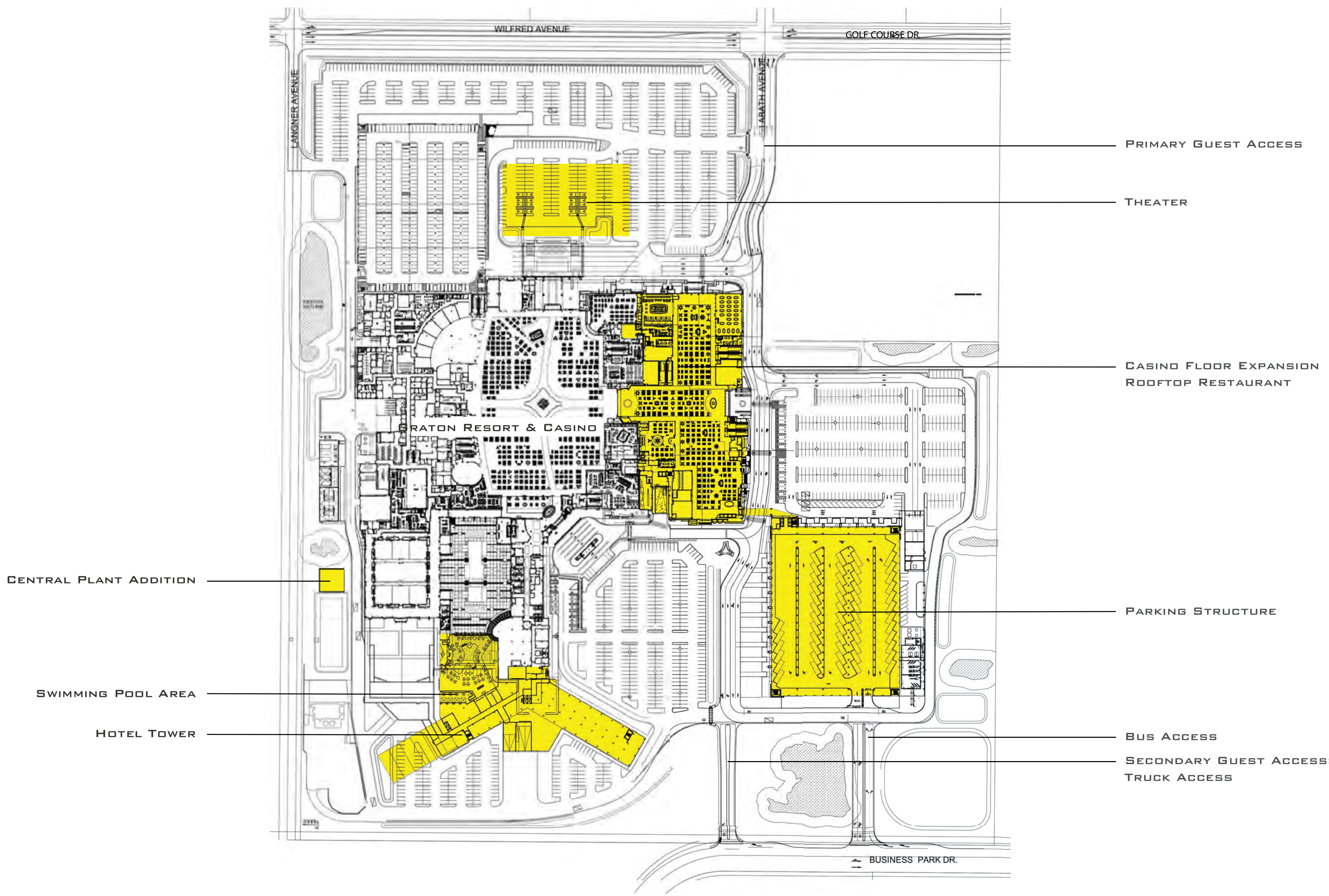


FIGURE 2 | SITE PLAN
TRAFFIC IMPACT STUDY
Graton Resort & Casino Expansion Project
Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

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 between 7:30 a.m. and 8:30 a.m. and 4:45 p.m. and 5:45 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 continue to be via driveways onto Golf Course Drive, Wilfred Avenue, and Business Park Drive. Eleven study intersections were analyzed.

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.

- Scenario 5: *Cumulative Conditions* – This scenario includes year 2040 cumulative volumes based on planned and approved projects, the Sonoma County Traffic Model, and the Northwest Specific Plan.

- Scenario 6: *Cumulative Plus Project Conditions* – This scenario includes year 2040 cumulative volumes based on the Sonoma County Traffic Model and the

Northwest Specific Plan EIR[2] 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:

- **U.S. 101** – US-101 is a six-lane freeway in the project area that generally runs in a north-south direction. Within the San Francisco Bay Area it provides access to Sonoma County, Marin County, San Francisco County, San Mateo County, and Santa Clara County. The posted speed limit on US-101 near the study area is 55 mph.

- **Golf Course Drive** - Golf Course Drive is an east-west arterial that connects the northeastern portions of Rohnert Park to U.S. 101. The corridor includes four lanes, on-street bicycle lanes, and sidewalks on both sides of the street except along the golf course, where the street has two lanes, on-street bicycle lanes, and a multi-use path on the north side of the street. In 2012, Golf Course Drive was extended on the west side of U.S. 101 via a freeway underpass, and the City renamed Golf Course Drive West between U.S. 101 and the western city limits. The posted speed limit is 35 mph.

- **Redwood Drive** - Redwood Drive is a major arterial that extends from SR 116 in Cotati to Millbrae Avenue. Redwood Drive includes four travel lanes, planted medians and/or two-way left-turn lanes, bike lanes, and sidewalks in the project area. The posted speed limit within Rohnert Park is 40 miles-per-hour (mph), except for the segment between Commerce Boulevard and Willis Road, which is currently posted at 35 mph.

- **Commerce Boulevard** - Commerce Boulevard is identified as a major arterial in the Rohnert Park 2020 General Plan and extends from SR 116 in Cotati to just north of Golf Course Drive, where it turns west and crosses under U.S. 101 and connects to Redwood Drive. Commerce Boulevard has posted speed limits of 35 and 40 mph.

- **Dowdell Avenue** - Dowdell Avenue has a 40-foot paved width with sidewalk on the east side of the street between Millbrae Avenue and approximately 375 feet north of Golf Course Drive West. Approaching Golf Course Drive West, Dowdell Avenue narrows to a configuration similar to Millbrae Avenue on the continuing segments to the south. The two-lane street segment is designated as a two-lane minor collector in the Rohnert Park 2020 General Plan. There is a City project in the approval phases that involves extending Dowdell Avenue south to connect to the southern segment of Dowdell Avenue at Business Park Drive, as specified in the Northwest Specific Plan.

---

[2] *City of Rohnert Park Northwest Specific Plan DEIR*, Placeworks, Berkeley, CA, June 2014.

- **Rohnert Park Expressway** – The Rohnert Park Expressway is an east-west arterial roadway that extends from Stony Point Road on the west to terminate to the east at Petaluma Hill Road. Within the project area it has a speed limit of 40 mph.

- **Business Park Drive** – Business Park Drive is a two lane roadway that extends east from Labath Avenue to terminate at Redwood Drive. The posted speed limit is 25 mph.

- **Labath Avenue** – Labath Avenue is a two lane roadway that extends north Laguna Drive through the Graton Resort to terminate just north of Milbrae Avenue. The posted speed limit is 25 mph.

3.4 Analysis Methodology

Existing operational conditions at the eleven (11) study intersections have been evaluated according to the requirements set forth by the Sonoma County and City of Rohnert Park 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.[3] 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. **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.

[3] *6th Edition of Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2016

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.

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 in May of 2022 at times when local schools were 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 D 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.

Sidewalks are provided on most existing roadways in the study area with the exception of portions of Business Park Drive and Golf Course Drive/Wilfred Avenue. On the south side of Golf Course Drive there is currently a sidewalk that extends west from Redwood Drive along the frontage of the Graton Resort to terminate at Langner Avenue. From Golf Course Drive there also is a sidewalk extending south along the west side of Labath Avenue which connects to the casino. According to information available from the Rohnert Park General Plan, the Rohnert Park Expressway, Labath Avenue, Redwood Drive, and Business Park Drive are all identified as being planned for Class II bike routes. In addition, there are planned Class I multi modal trails in the project vicinity that would connect the downtown area of the City with the project area.

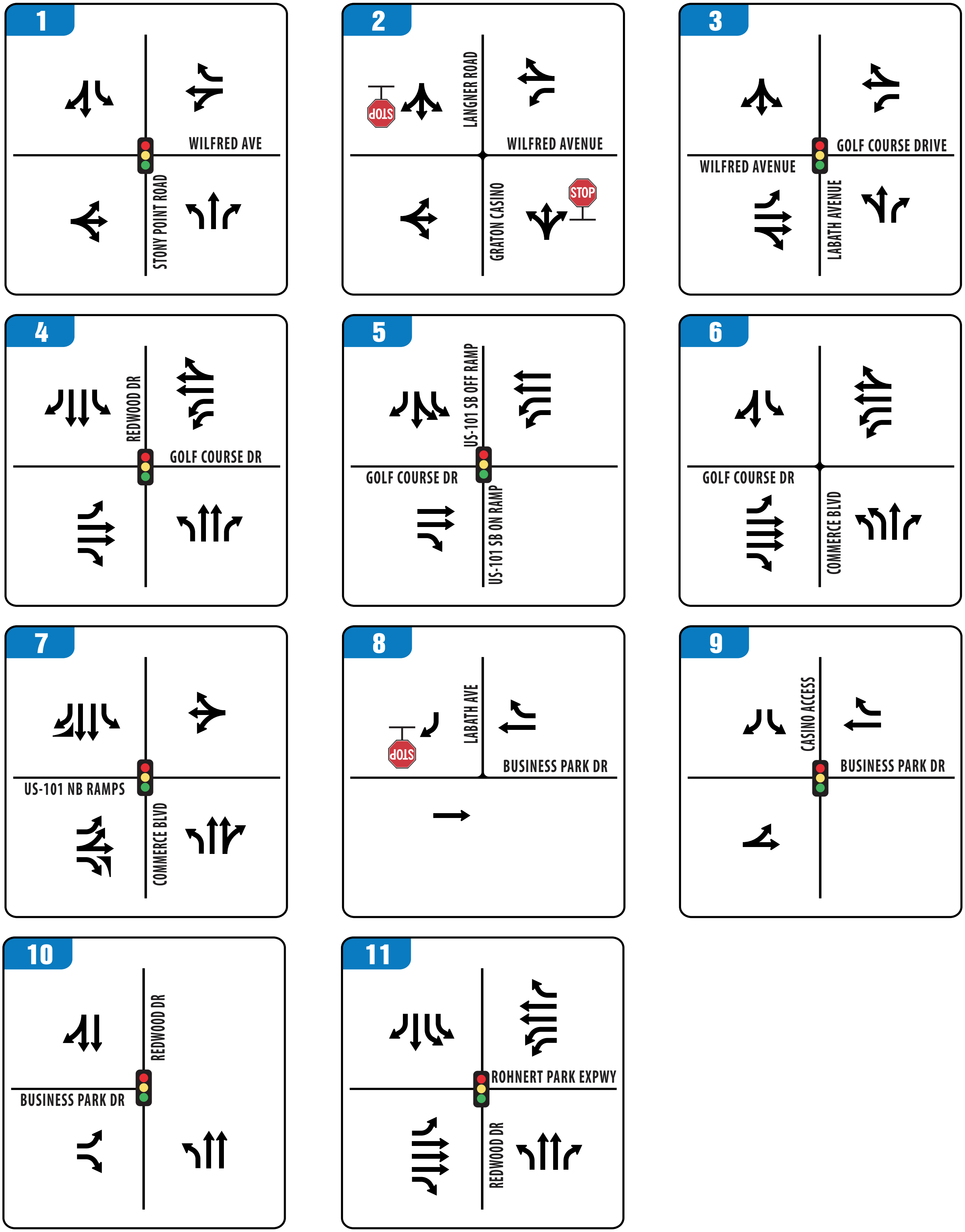


FIGURE 3 | EXISTING LANE CONFIGURATION

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

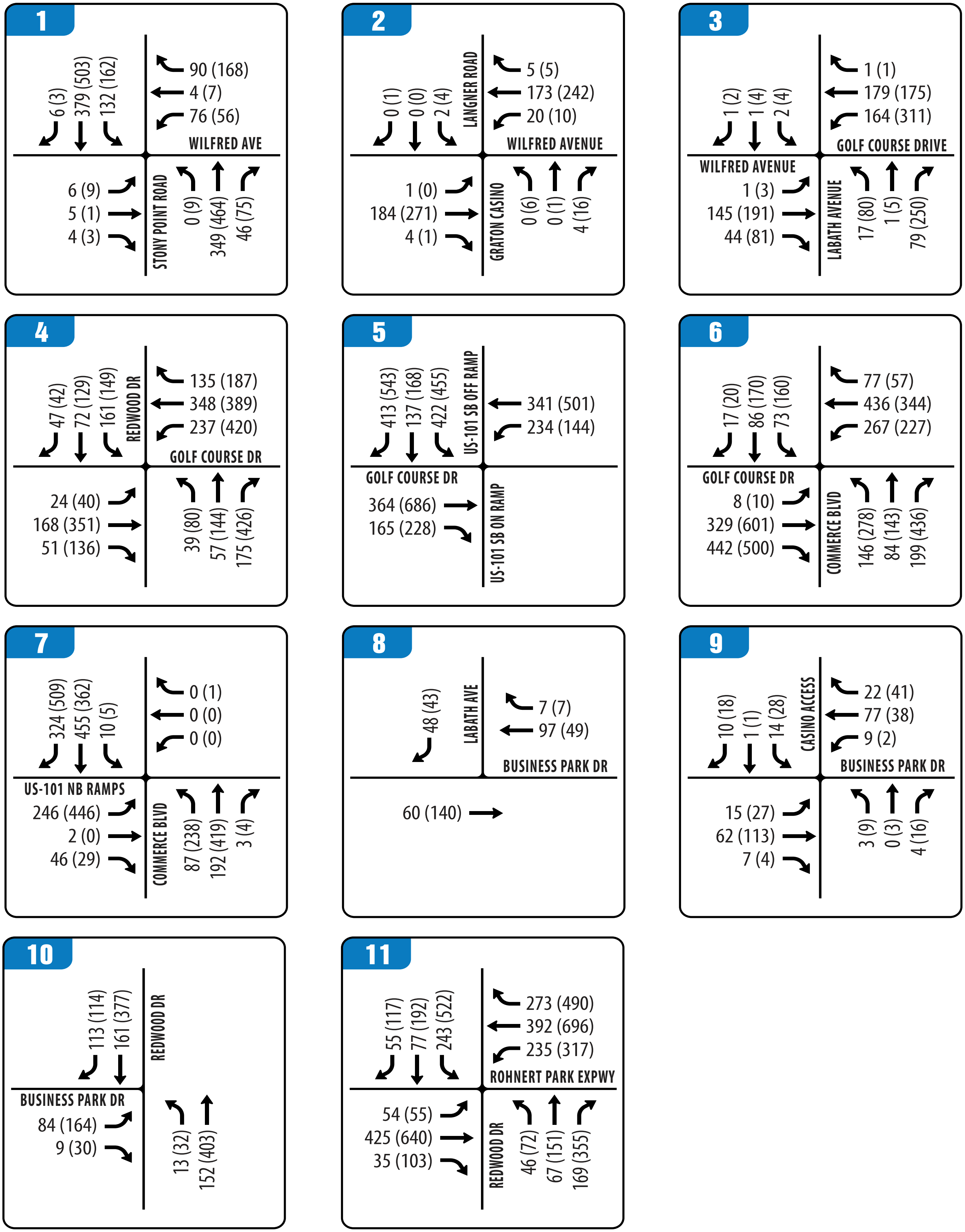


FIGURE 4 | EXISTING AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

TABLE 3
EXISTING INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	EXISTING	
				Delay	LOS
1	WILFRED AVENUE & STONY POINT ROAD	Signalized	AM	9.7	A
			PM	14.1	B
2	WILFRED AVENUE & LANGNER AVENUE	Side Street Stop	AM	12.0	B
			PM	13.2	B
3	GOLF COURSE DRIVE/ WILFRED AVENUE & LABATH AVENUE	Signalized	AM	9.2	A
			PM	11.8	B
4	GOLF COURSE DRIVE & REDWOOD DRIVE	Signalized	AM	16.8	B
			PM	24.3	C
5	GOLF COURSE DRIVE & US-101 SOUTHBOUND RAMPS	Signalized	AM	13.7	B
			PM	18.2	B
6	GOLF COURSE DRIVE & COMMERCE BOULEVARD	Signalized	AM	17.8	B
			PM	28.2	C
7	COMMERCE BOULEVARD & US-101 NORTHBOUND RAMPS	Signalized	AM	10.1	B
			PM	15.8	B
8	BUSINESS PARK DRIVE & LABATH AVENUE	Side Street Stop	AM	9.0	A
			PM	8.7	A
9	BUSINESS PARK DRIVE & CASINO ACCESS	Signalized	AM	11.2	B
			PM	11.6	B
10	BUSINESS PARK DRIVE & REDWOOD DRIVE	Signalized	AM	7.0	A
			PM	7.7	A
11	ROHNERT PARK EXPRESSWAY & REDWOOD DRIVE	Signalized	AM	16.5	B
			PM	30.0	C

SOURCE: Abrams Associates, 2023 **NOTE:** Delay results are presented in terms of seconds per vehicle.

3.7 Transit Service

Bus Transit - Bus transit service in the project area is provided by Sonoma County Transit. Sonoma County Transit operates local bus routes 10, 12, and 14 within the City of Rohnert Park. The routes operate on approximately half hour to one hour headways Monday through Friday from about 6:00 AM to 6:00 PM. Limited Saturday service is also offered. The routes provide connections to regional transit via intercity routes 44 and 48 and also the SMART Train commuter rail service. Sonoma County Transit (SCT) provides weekday and weekend services to the Graton Resort & Casino. All routes are serviced at the north entrance of the Resort adjacent to the proposed project site. Route 26 provides weekday services and routes 44, 48, and 1 provide weekend services. Public transportation in the larger area includes several intra-City routes operated by SCT which pass through a transfer station near the intersection of Commerce Drive and Rohnert Park Expressway. Buses pass through the transfer station approximately every 30 to 40 minutes on weekdays and approximately every hour on weekends. SCT also provides several inter-City routes that serve the cities of Sebastopol and Santa Rosa. Inter-City routes connect to a separate transfer station also located near the vicinity of the intra-City station. Bus frequencies are similar to the intra-City service. Golden Gate Transit also operates routes along US-101 that pass through Rohnert Park and connect with cities including San Francisco, San Rafael, Petaluma, and Santa Rosa. During the weekday, routes operate in the am and pm peak travel directions and stop at the Rohnert Park inter-City transfer station.

Rail Transit - The Sonoma-Marin Area Rail Transit (SMART) provides additional transportation capacity along the US-101 corridor, operating from the Sonoma County Airport on the north to Downtown San Rafael and Larkspur to the south. The line is also planned to eventually be extended north to the Cities of Healdsburg and Cloverdale.

Private Transit Services - The Graton Resort & Casino provides a bus service that carries patrons to and from various points in the Bay Area, including San Francisco's Chinatown, Daly City, San Jose, and Milpitas. Approximately 36 buses run from the Graton Resort to the Bay Area every day.

3.8 Standards and Objectives

Existing policies, laws and regulations that apply to 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.

Sonoma County General Plan - The Transportation and Circulation Element included in the Sonoma County 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 County 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 County.

City of Rohnert Park General Plan - The Circulation Element included in the City of Rohnert Park General also identifies roadway and transit goals and policies that have been adopted to ensure that the transportation system of the City will continue to have adequate capacity to serve planned growth.

Northwest Specific Plan - The Northwest Specific Plan Area is identified in the City's General Plan as an expansion area for the City. The General Plan called for a Specific Plan to be developed for this area ahead of eventual annexation by the City of Rohnert Park. The plan was completed and adopted by the City Council on November 25, 2014. Please note the Northwest Specific Plan Area was annexed by the City in 2015 (and includes the project site).

Wilfred/Dowdell Village Specific Plan - The Wilfred/Dowdell Specific Plan includes approximately 24.77 acres, divided into "*Village North*", the area north of Wilfred Avenue, with 4.58 acres; and "*Village South*" the area south of Wilfred Avenue, with 20.19 acres. In Village

North, the Specific Plan would allow for region-serving businesses similar to those that have been developed nearby, including home improvement and department stores and a motel or hotel. The Village South development is planned to consist of a shopping center with a few large retailers or many retail and restaurant uses and other services.

Significance Criteria – For the purposes of this analysis a project would have a significant impact if it would:

- Conflict with an applicable program, plan, ordinance or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, roadways, bicycle lanes and pedestrian facilities/paths?

  The goal of the Sonoma County is to maintain a Level of Service (LOS) D during the peak hours, according to the General Plan. The County does not have plans, ordinances, or policies establishing measures of effectiveness for the performance of other parts of its circulation system. Please note this report also includes intersections under the jurisdiction of the City of Rohnert Park and Caltrans. The applicable measures of effectiveness are summarized below:

  Signalized Intersections - Project-related operational impacts on the signalized study intersections in the Sonoma County are considered significant if project-related traffic causes the Level of Service (LOS) rating to deteriorate from LOS D to LOS E or F. In addition, in Sonoma County project impacts are also considered significant if a signalized intersection already operates at LOS E or F without project trips, and the project causes the average delay to increase by five seconds or more. Project-related operational impacts on signalized study intersections in the City of Rohnert Park are considered significant if project-related traffic causes the Level of Service (LOS) rating to deteriorate from LOS C to LOS D, E, or F, except for the following intersections which are permitted to operate at LOS D: Golf Course Drive West at Redwood Drive, Golf Course Drive West at the U.S. 101 Southbound Ramps, Golf Course Drive at Commerce Boulevard, Commerce Boulevard at the U.S. 101 Northbound Ramps, and the Rohnert Park Expressway at Redwood Drive. Lower LOS is permitted if no feasible improvement is available and project does not cause a further decrease in LOS.

  Unsignalized Intersections - Project-related operational impacts on unsignalized intersections in Sonoma County are considered significant if project generated traffic causes the average of all movements to deteriorate from LOS D or better to LOS E or F. For unsignalized intersections where the LOS would already exceed County standards it was considered a significant impact if Caltrans peak hour traffic signal warrants would be met. Project-related operational impacts on the unsignalized intersections in the City of Rohnert Park are considered significant if project generated traffic causes the average of all movements to deteriorate from LOS C or better to LOS D, E or F.

- 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?

- 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 peak-hour trip generation of the proposed casino was reviewed based on information published in Institute of Transportation Engineers (ITE) Trip Generation Manual (Eleventh Edition, 2021). However, as described below, more recent trip generation data available from surveys of existing indian casinos is available, and this data was used to estimate the traffic that would be produced by the casino portion of the Proposed 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 surveys of six casino/video lottery establishments taken in South Dakota in the 1990's. The square footages of the surveyed facilities ranged from 600 to 2,400 square feet. Based on preliminary calculations and a comparison of this rate with other studies (described below) it was found that use of the ITE rate was inappropriate and produced results that did not compare with the expected traffic of the Proposed Project. This was verified based on the trip generation of the existing casino, as determined from numerous traffic counts conducted at the entrances to the existing Graton Resort & Casino.

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 average of the traffic surveys conducted at three similar Indian 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 Indian gaming facilities and on the actually developed trip rates for weekday daily, AM and PM peak of the

[4] *Transportation Impact Analysis of the Tejon Casino*, Linscott, Law, & Greenspan Engineers, San Diego, CA, October 30, 2019.

street, as well as Saturday peak hour of the generator conditions. A review of other more recent casino traffic impact studies indicates this data can still be considered conservative.

Casino Hotel Trip Generation – Unlike stand-alone hotels, guests of Indian casino hotels are primarily attracted by the casino facilities, and the hotel facilities are a secondary attraction. Hence the trip generation rates are lower than those for a stand-alone hotel. The Traffic Needs Assessment of Tribal Development Projects in the San Diego Region prepared by the San Diego Association of Governments (SANDAG) recommends a daily trip rate of 3 trips per occupied room for casino hotels, with 7.2% of daily traffic assumed to occur during the PM peak hour. This rate accounts for internal capture between the hotel 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. This table does not include

TABLE 4
PROJECT TRIP GENERATION CALCULATIONS

Land Use	Size	ADT	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Indian Casino Trip Rates - Trips per Square Feet		98.21	1.78	1.64	3.42	3.10	3.64	6.74
Proposed Casino Expansion Trip Generation	**86,078 sq. ft.**	**8,454**	**153**	**142**	**294**	**267**	**313**	**580**
Indian Casino Hotel Trip Rates - Trips per Room		3.00	0.12	0.05	0.17	0.07	0.14	0.22
Proposed Hotel Expansion Trip Generation	**221 rooms**	**663**	**27**	**10**	**37**	**17**	**31**	**48**
Graton Resort & Casino Expansion Project Total Trip Generation		**9,117**	**180**	**152**	**332**	**284**	**344**	**628**

the existing casino and hotel trip generation. The casino floor expansion is assumed to be 86,078 square feet based on a review of the plans, but it is our understanding the final expansion area may be less than this. During the normal weekday commute peak hours the Proposed Project is estimated to generate a total of approximately 332 AM peak hour trips (180 inbound and 152 outbound) and 628 PM peak hour trips (284 inbound and 344 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 Sonoma County, the existing directional split at nearby intersections, and the overall land use patterns in the area. **Figure 5** shows the project trips that would be added at the study intersections.

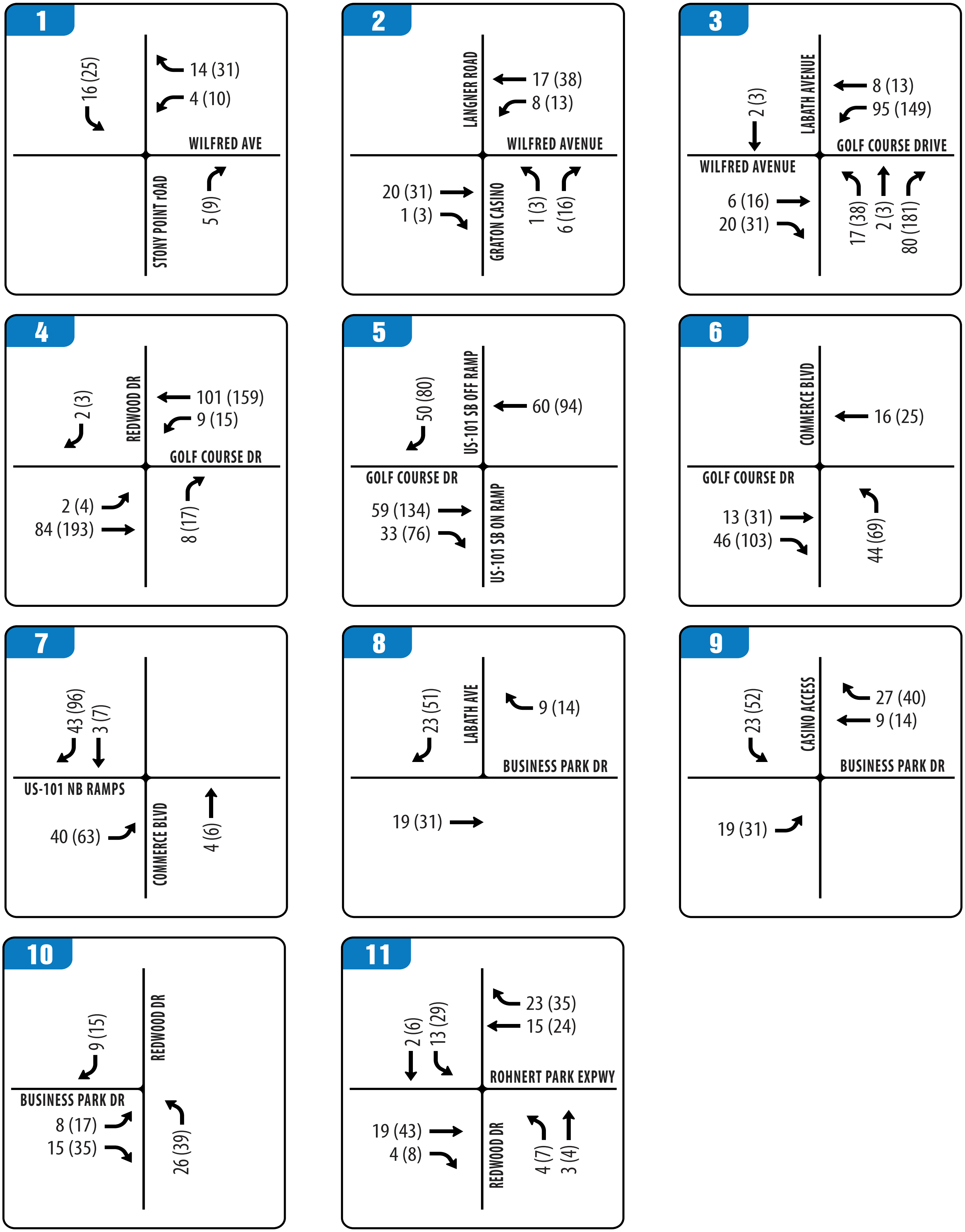


FIGURE 5 | PROJECT AM(PM) PEAK HOUR TRIPS

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

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 D or better) during the weekday AM and PM peak hours with the exception all of the project study intersections currently have acceptable conditions (LOS D or better) 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 theater. Weekday Theater/Special Event conditions are analyzed in Section 4.8 and Friday Theater/Special Event conditions are analyzed in Section 4.11.

TABLE 5
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	WILFRED AVENUE & STONY POINT ROAD	Signalized	AM	9.7	A	10.2	B
			PM	14.1	B	15.9	B
2	WILFRED AVENUE & LANGNER AVENUE	Side Street Stop	AM	12.0	B	12.8	B
			PM	13.2	B	14.9	B
3	GOLF COURSE DRIVE / WILFRED AVENUE & LABATH AVENUE	Signalized	AM	9.2	A	10.0	A
			PM	11.8	B	15.4	B
4	GOLF COURSE DRIVE & REDWOOD DRIVE	Signalized	AM	16.8	B	17.7	B
			PM	24.3	C	27.7	C
5	GOLF COURSE DRIVE & US-101 SOUTHBOUND RAMPS	Signalized	AM	13.7	B	15.1	B
			PM	18.2	B	23.8	C
6	GOLF COURSE DRIVE & COMMERCE BOULEVARD	Signalized	AM	17.8	B	18.7	B
			PM	28.2	C	28.6	C
7	COMMERCE BOULEVARD & US-101 NORTHBOUND RAMPS	Signalized	AM	10.1	B	10.4	B
			PM	15.8	B	16.5	B
8	BUSINESS PARK DRIVE & LABATH AVENUE	Side Street Stop	AM	9.0	A	9.1	A
			PM	8.7	A	9.0	A
9	BUSINESS PARK DRIVE & CASINO ACCESS	Signalized	AM	11.2	B	11.6	B
			PM	11.6	B	12.6	B
10	BUSINESS PARK DRIVE & REDWOOD DRIVE	Signalized	AM	7.0	A	7.6	A
			PM	7.7	A	8.9	A
11	ROHNERT PARK EXPRESSWAY & REDWOOD DRIVE	Signalized	AM	16.5	B	16.9	B
			PM	30.0	C	31.3	C

SOURCE: Abrams Associates, 2023 **NOTE:** Delay results are presented in terms of seconds per vehicle.

4.4 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

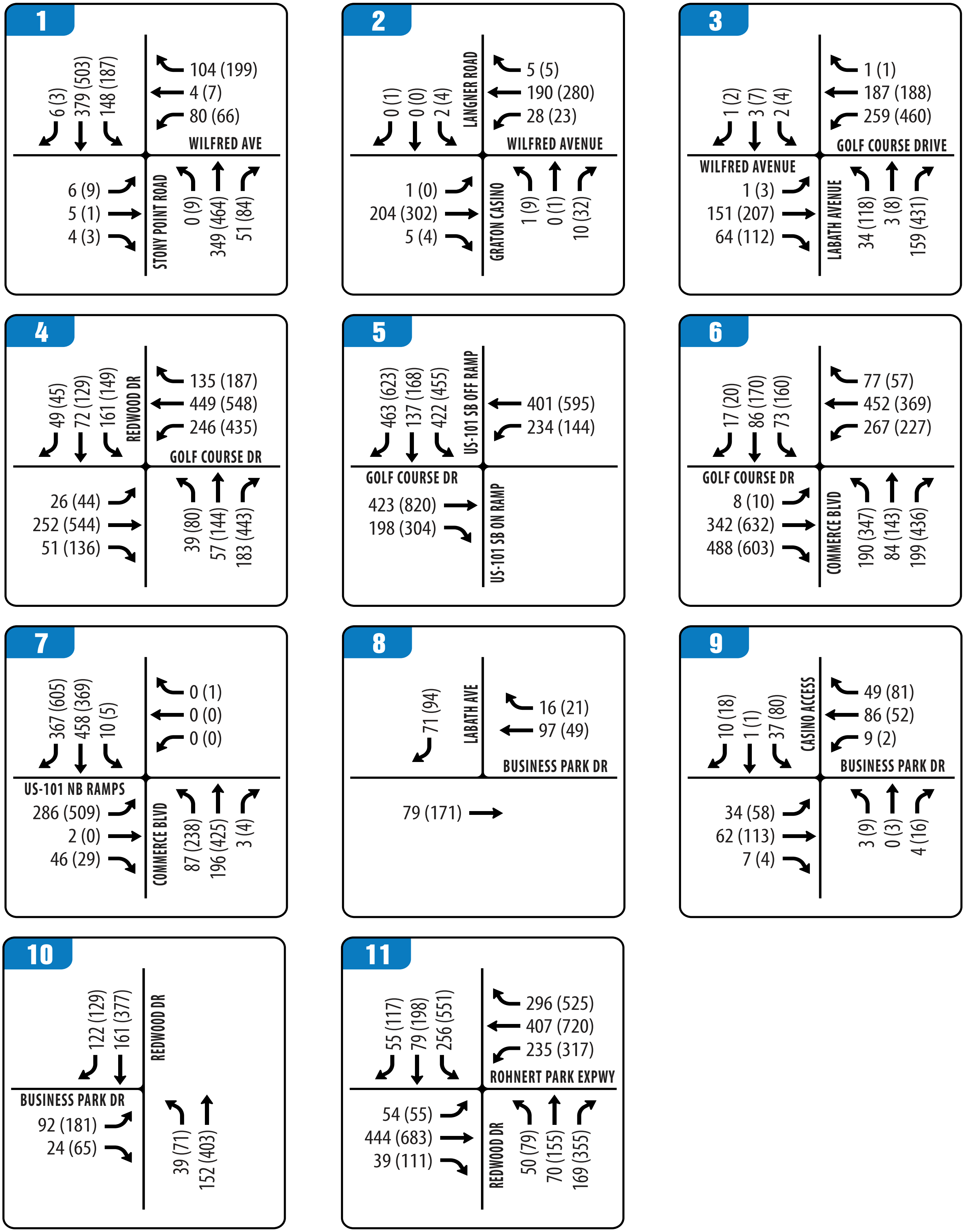


FIGURE 6 | EXISTING PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

completion date would be 2025 with a 10% growth in background traffic (representing approved projects and a partial return to pre-covid conditions). The traffic volumes for each of the study intersections for the Baseline scenario are shown in **Figure 7**. **Table 6** summarizes the associated LOS computation results for the Baseline weekday AM and PM peak hour conditions. As shown in **Table 6**, all of the study intersections would continue to have acceptable conditions under the Baseline scenario during the weekday AM and PM peak hours.

4.5 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 6** 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 6**, 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 4.8.

TABLE 6
BASELINE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

	INTERSECTION	CONTROL	PEAK HOUR	BASELINE		BASELINE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	WILFRED AVENUE & STONY POINT ROAD	Signalized	AM	10.2	B	10.9	B
			PM	15.7	B	18.1	B
2	WILFRED AVENUE & LANGNER AVENUE	Side Street Stop	AM	12.5	B	13.4	B
			PM	14.0	B	15.9	C
3	GOLF COURSE DRIVE / WILFRED AVENUE & LABATH AVENUE	Signalized	AM	9.4	A	10.2	B
			PM	12.5	B	16.5	B
4	GOLF COURSE DRIVE & REDWOOD DRIVE	Signalized	AM	17.9	B	19.0	B
			PM	27.1	C	29.2	C
5	GOLF COURSE DRIVE & US-101 SOUTHBOUND RAMPS	Signalized	AM	15.1	B	16.8	B
			PM	21.6	C	30.1	C
6	GOLF COURSE DRIVE & COMMERCE BOULEVARD	Signalized	AM	19.3	B	20.3	C
			PM	31.9	C	33.4	C
7	COMMERCE BOULEVARD & US-101 NORTHBOUND RAMPS	Signalized	AM	10.5	B	10.8	B
			PM	17.0	B	17.7	B
8	BUSINESS PARK DRIVE & LABATH AVENUE	Side Street Stop	AM	9.1	A	9.2	A
			PM	8.8	A	9.0	A
9	BUSINESS PARK DRIVE & CASINO ACCESS	Signalized	AM	11.2	B	11.5	B
			PM	11.7	B	12.8	B
10	BUSINESS PARK DRIVE & REDWOOD DRIVE	Signalized	AM	7.0	A	7.7	A
			PM	8.0	A	9.2	A
11	ROHNERT PARK EXPRESSWAY & REDWOOD DRIVE	Signalized	AM	17.5	B	17.9	B
			PM	32.3	C	33.0	C

SOURCE: Abrams Associates, 2020 **NOTE:** Delay results are presented in terms of seconds per vehicle.

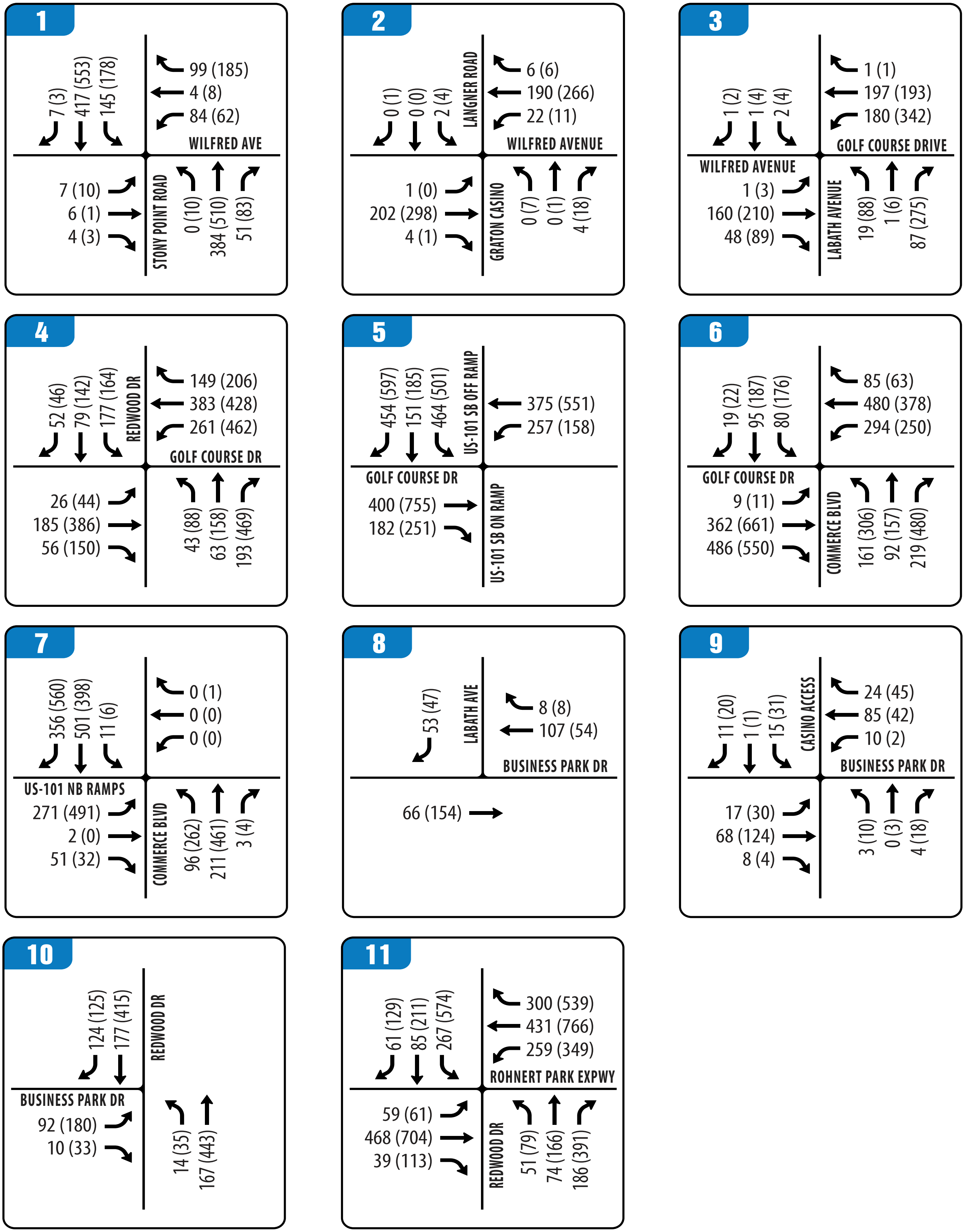


FIGURE 7 | BASELINE AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

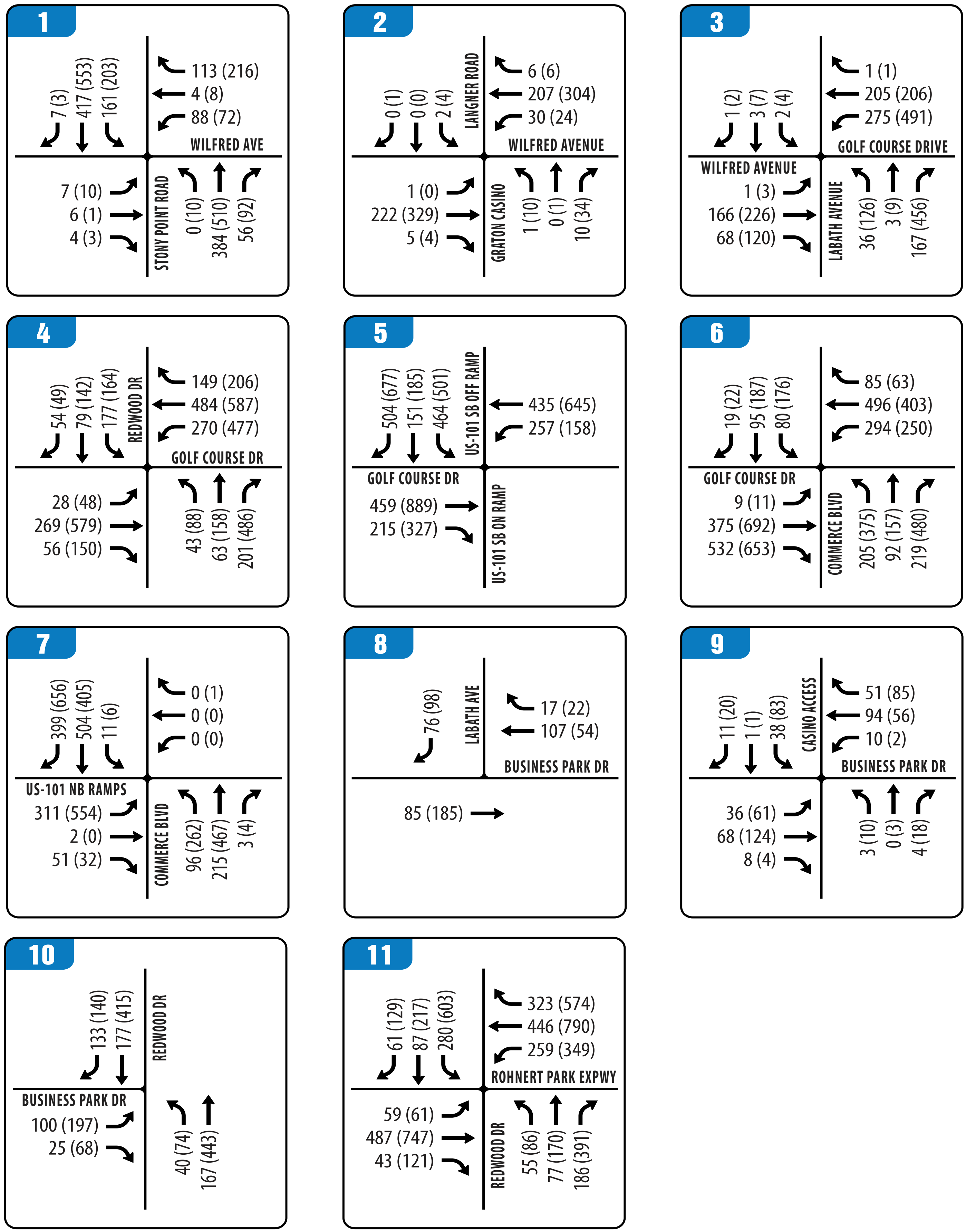


FIGURE 8 | BASELINE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

4.6 Cumulative Traffic Capacity Conditions (Scenario 5)

For the cumulative conditions, the intersection traffic volumes were based on the existing turning movements plus incremental growth in background traffic based on the Sonoma County Traffic Model and the Northwest Specific Plan DEIR. **Figure 9** presents the cumulative build-out traffic volumes for the project study intersections. **Table 7** summarizes the LOS results for the Cumulative (Year 2040) 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, with the exception of Golf Course Drive at Redwood Drive and at Commerce Boulevard.

4.7 Cumulative Plus Project Traffic Capacity Conditions (Scenario 6)

Table 7 summarizes the LOS results for the Cumulative Plus Project (Year 2040) 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 peak hours, with the exception of Golf Course Drive at Redwood Drive, at the U.S. 101 Southbound Ramps, and at Commerce Boulevard. Mitigations to improve the operations at these intersections are discussed in Section 5. Please note this scenario represents average weekday conditions that assume there is no event being held at the proposed theater. Weekday Theater/Special Event conditions are analyzed in Section 4.8 and Friday Theater/Special Event conditions are analyzed in Section 4.11.

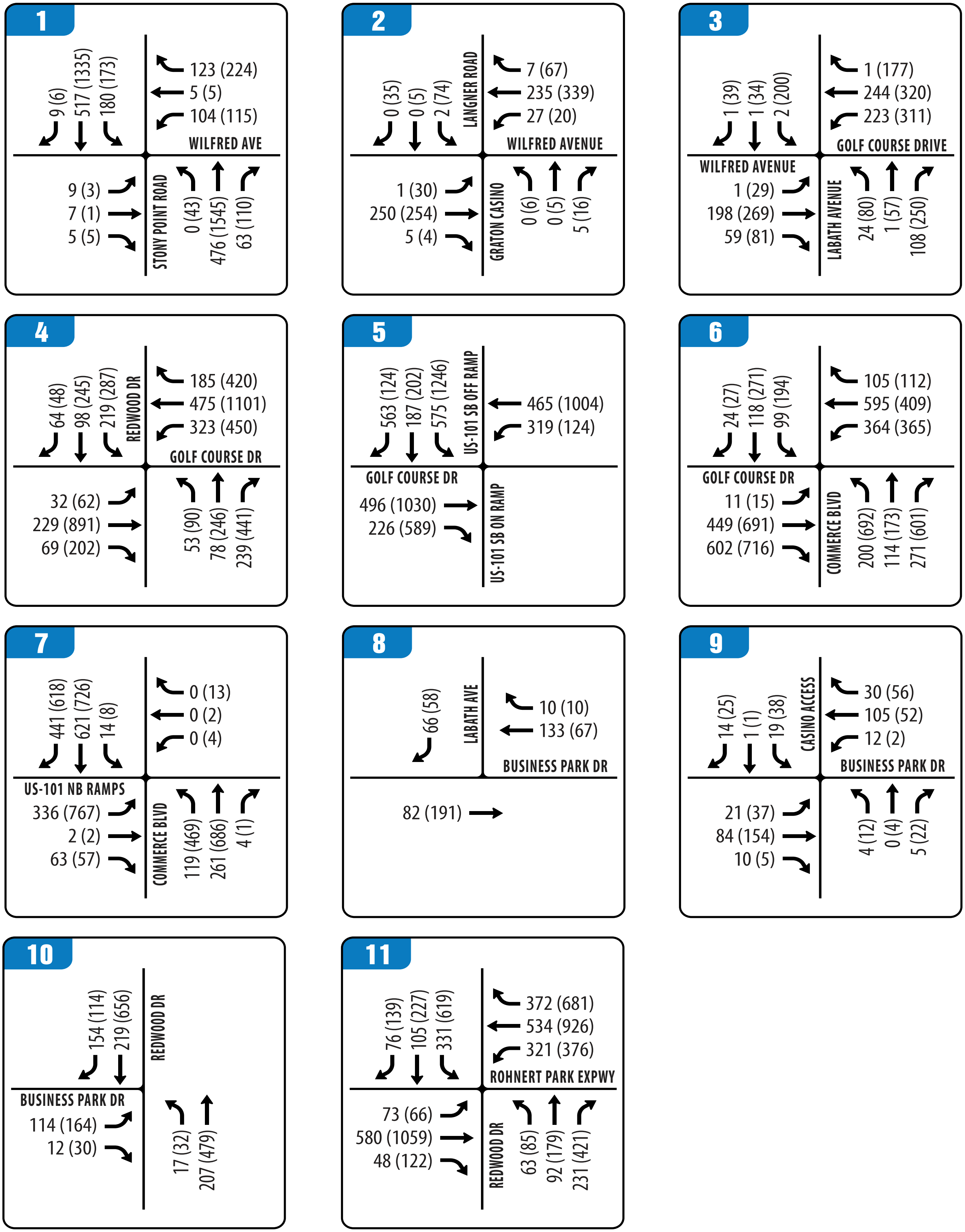


FIGURE 9 | CUMULATIVE AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

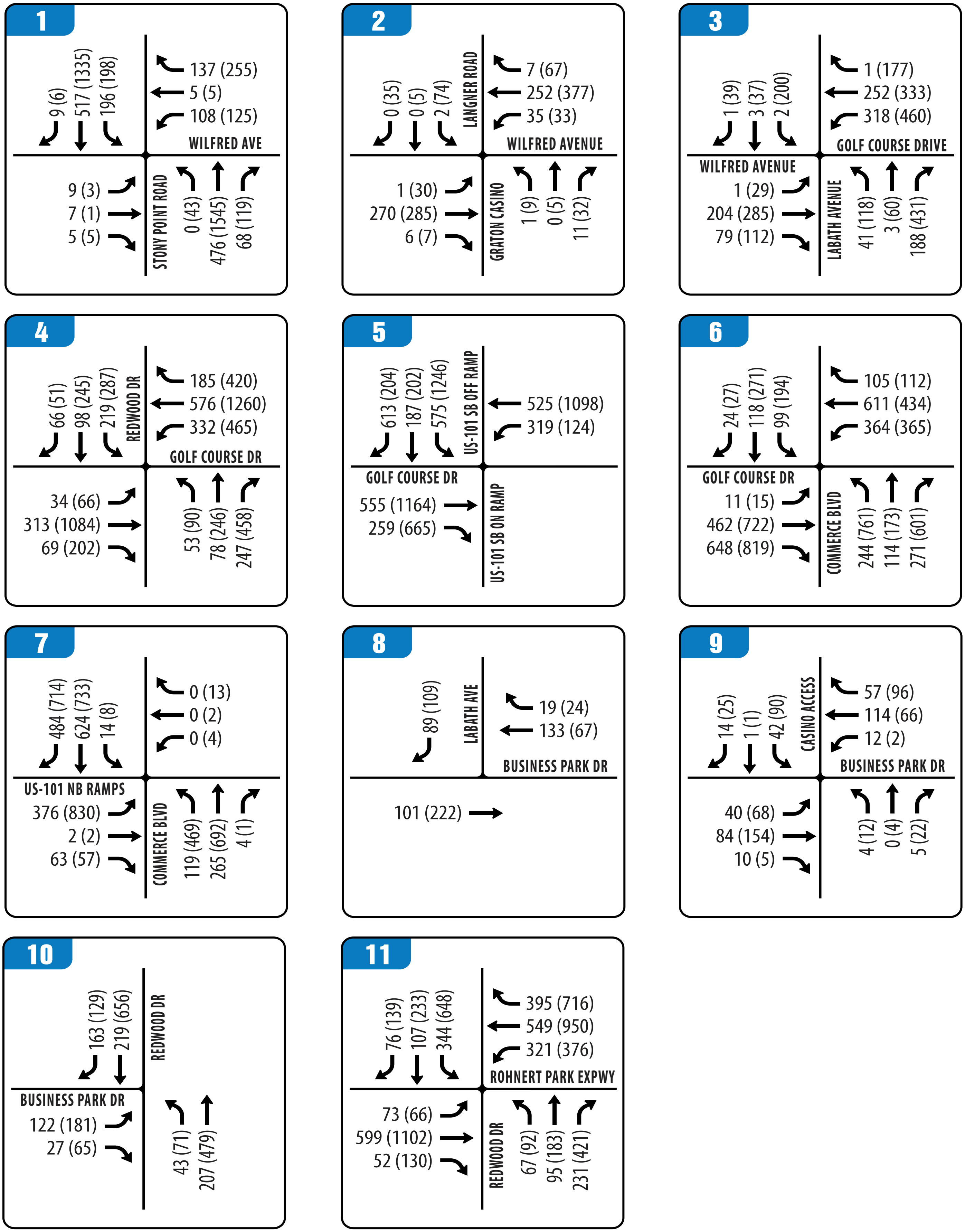


FIGURE 10 | CUMULATIVE PLUS PROJECT AM(PM) PEAK HOUR TRAFFIC VOLUMES

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

TABLE 7
CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE CONDITIONS

	INTERSECTION	CONTROL	PEAK HOUR	CUMULATIVE		CUMULATIVE PLUS PROJECT	
				Delay	LOS	Delay	LOS
1	WILFRED AVENUE & STONY POINT ROAD	Signalized	AM	12.3	B	13.1	B
			PM	26.6	C	32.2	C
2	WILFRED AVENUE & LANGNER AVENUE	Side Street Stop	AM	14.0	B	15.0	C
			PM	21.7	C	27.8	D
3	GOLF COURSE ROAD / WILFRED AVENUE & LABATH AVENUE	Signalized	AM	9.7	A	10.8	B
			PM	19.1	B	30.4	C
4	GOLF COURSE DRIVE & REDWOOD DRIVE	Signalized	AM	21.6	C	23.1	C
			PM	**60.9**	**E**	**73.1**	**E**
5	GOLF COURSE DRIVE & US-101 SOUTHBOUND RAMPS	Signalized	AM	20.2	C	23.2	C
			PM	46.2	D	**56.0**	**E**
6	GOLF COURSE DRIVE & COMMERCE BOULEVARD	Signalized	AM	25.0	C	27.6	C
			PM	**60.9**	**E**	**74.0**	**E**
7	COMMERCE BOULEVARD & US-101 NORTHBOUND RAMPS	Signalized	AM	11.8	B	12.1	B
			PM	43.5	D	47.4	D
8	BUSINESS PARK DRIVE & LABATH AVENUE	Side Street Stop	AM	9.3	A	9.5	A
			PM	8.9	A	9.1	A
9	BUSINESS PARK DRIVE & CASINO ACCESS	Signalized	AM	11.2	B	11.6	B
			PM	12.0	B	13.1	B
10	BUSINESS PARK DRIVE & REDWOOD DRIVE	Signalized	AM	7.3	A	8.0	A
			PM	8.1	A	9.5	A
11	ROHNERT PARK EXPRESSWAY & REDWOOD DRIVE	Signalized	AM	20.7	C	21.2	C
			PM	39.4	D	40.7	D

SOURCE: Abrams Associates, 2023 **NOTE:** Delay results are presented in terms of seconds per vehicle.

4.9 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, August 26th. **Table 8** summarizes the associated LOS computation results for cumulative Friday PM peak hour conditions. 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 Friday Evening cumulative and cumulative plus project conditions are presented in **Table 8**. As shown in **Table 8**, all of the project study intersections would continue to have acceptable operations (LOS D or better) under cumulative plus project conditions during the Friday PM peak hours except for Wilfred Avenue at Langner Avenue and Golf Course Drive at Redwood Drive, the U.S. 101 Southbound Ramps, Commerce Boulevard, and also Commerce Boulevard at the U.S. 101 Ramps. Mitigations to improve the operations at these intersections are discussed in Section 5.

4.10 Friday Evening Concert/Special Event Traffic Capacity Conditions

The proposed theater would include 97,000 square feet of space with up to 3,500 seats. The resulting trip generation forecasts for the theater, the trip distribution graphic, 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 show and conservatively assumed that

TABLE 8
FRIDAY EVENING CUMULATIVE PLUS PROJECT INTERSECTION
LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	CUMULATIVE		CUMULATIVE PLUS PROJECT	
			Delay	LOS	Delay	LOS
1	WILFRED AVENUE & STONY POINT ROAD	Signalized	34.2	C	42.1	D
2	WILFRED AVENUE & LANGNER AVENUE	Side Street Stop	27.2	D	**36.8**	**E**
3	GOLF COURSE DRIVE / WILFRED AVENUE & LABATH AVENUE	Signalized	23.3	C	39.6	D
4	GOLF COURSE DRIVE & REDWOOD DRIVE	Signalized	**77.3**	**E**	**92.9**	**F**
5	GOLF COURSE DRIVE & US-101 SOUTHBOUND RAMPS	Signalized	63.1	E	**75.5**	**E**
6	GOLF COURSE DRIVE & COMMERCE BOULEVARD	Signalized	**77.7**	**E**	**96.0**	**F**
7	COMMERCE BOULEVARD & US-101 NORTHBOUND RAMPS	Signalized	54.2	D	**60.4**	**E**
8	BUSINESS PARK DRIVE & LABATH AVENUE	Side Street Stop	8.8	A	9.1	A
9	BUSINESS PARK DRIVE & CASINO ACCESS	Signalized	11.9	B	13.0	B
10	BUSINESS PARK DRIVE & REDWOOD DRIVE	Signalized	9.2	A	10.6	B
11	ROHNERT PARK EXPRESSWAY & REDWOOD DRIVE	Signalized	42.8	D	44.6	D

SOURCE: Abrams Associates, 2023 **NOTE:** Delay results are presented in terms of seconds per vehicle.

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.[5]

Table 8 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 9**. 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 Wilfred Avenue at Langner Avenue and Golf Course Drive at Labath Avenue, Redwood Drive, the U.S. 101 Southbound Ramps, Commerce Boulevard, and also Commerce Boulevard at the U.S. 101 Ramps. The addition of traffic from the proposed project (plus a full capacity event at the theater) would cause the level

[5] *Tachi Palace Hotel and Casino Expansion Project Traffic Impact Study*, VRPA Technologies Inc., Fresno, CA, May, 2020. [5]

TABLE 9
FRIDAY CUMULATIVE PLUS PROJECT AND SPECIAL EVENT INTERSECTION LEVEL OF SERVICE CONDITIONS

INTERSECTION		CONTROL	CUMULATIVE		CUMULATIVE PLUS PROJECT PLUS THEATRE	
			Delay	LOS	Delay	LOS
1	WILFRED AVENUE & STONY POINT ROAD	Signalized	34.2	C	50.5	D
2	WILFRED AVENUE & LANGNER AVENUE	Side Street Stop	27.2	D	**57.5**	**F**
3	GOLF COURSE DRIVE / WILFRED AVENUE & LABATH AVENUE	Signalized	23.3	C	**93.9**	**F**
4	GOLF COURSE DRIVE & REDWOOD DRIVE	Signalized	**77.3**	**E**	**122.6**	**F**
5	GOLF COURSE DRIVE & US-101 SOUTHBOUND RAMPS	Signalized	63.1	E	**78.1**	**E**
6	GOLF COURSE DRIVE & COMMERCE BOULEVARD	Signalized	**77.7**	**E**	**115.3**	**F**
7	COMMERCE BOULEVARD & US-101 NORTHBOUND RAMPS	Signalized	54.2	D	**73.2**	**E**
8	BUSINESS PARK DRIVE & LABATH AVENUE	Side Street Stop	8.8	A	9.1	A
9	BUSINESS PARK DRIVE & CASINO ACCESS	Signalized	11.9	B	14.6	B
10	BUSINESS PARK DRIVE & REDWOOD DRIVE	Signalized	9.2	A	12.9	B
11	ROHNERT PARK EXPRESSWAY & REDWOOD DRIVE	Signalized	42.8	D	47.3	D

SOURCE: Abrams Associates, 2023 **NOTE:** Delay results are presented in terms of seconds per vehicle.

of service standards to be exceeded these intersections. Mitigations to improve the operations at these intersections are discussed in Section 5.

4.11 Vehicle Miles Traveled

One performance measure that can be used to quantify the transportation impacts of a project is vehicle miles traveled (VMT). This section presents an analysis of the extent of the VMT-related transportation impacts caused by the Project. OPR recommends that VMT thresholds for residential and employment-based land use projects be set at fifteen percent below the baseline VMT/capita or VMT/employee.[6] The Project is not located in a Transit Priority Area and, subject to County approval, would not otherwise be screened out from VMT analysis because of its location in a relatively high VMT generating area.

[6] *Technical Advisory on Evaluating Transportation Impacts in CEQA*, Governor's Office of Planning and Research, Sacramento, CA, December, 2018.

In Sonoma County VMT is typically estimated using a regional travel demand model maintained by the Sonoma County Transportation Authority (SCTA). The model calculates VMT based on the number of vehicles multiplied by the typical distance traveled by each vehicle originating from or driving to a certain area. As with all models, the accuracy of the output depends on the level of detail in the model. The volume of traffic and distance traveled depends on mix of land use types, density, and location as well as the existing and planned transportation system, including availability of public transportation. A travel demand model attempts to properly represent these relationships when forecasting vehicle trips and VMT. The model divides areas within the County into transportation analysis zones, or TAZs, which are used for transportation analysis and other planning purposes. The SCTA Travel Model includes TAZs that vary in size from a few city blocks in some areas to much larger zones in lower density areas.

Near-Term Plus Project VMT Analysis - Based on the SCTA Travel Demand Model the County's average VMT per employee is estimated to be 12.5 miles. The employees of the proposed project would be expected to have similar VMT to existing employees within the TAZ where the project is located, and in other surrounding TAZ's with similar land uses. The VMT per employee estimated by the STA Travel Model for the project area would therefore be assumed represent the approximate VMT per employee that would be generated by the proposed project as well. The project site is located in TAZ 359. **Table 10** summarizes the existing VMT per employee for the project and provides a comparison to the County average VMT per employee.

TABLE 10
NEAR-TERM PLUS PROJECT VMT RESULTS

Scenario	***Project Average VMT Per Employee***	***VMT Impact Threshold*** [1]	***Impact?***
2023 Plus Project	**21.8 miles**	**10.7 miles**	**Yes**

NOTE: [1] *The existing plus project VMT impact threshold for commercial projects in Sonoma County is a VMT per employee that is no higher than 85% of the Countywide average VMT per employee (12.5) which equates to a threshold of 10.7 miles.*

As seen in **Table 10**, the proposed project is forecast to have an average VMT per employee of 21.8 miles. Data from the SCTA model indicates the project could have a significant impact on VMT in the County. The model indicates the project would require over a 50% decrease in VMT to meet the County's established threshold. For projects in a suburban setting, studies indicate the maximum VMT reduction associated with the implementation of TDM strategies would be about 25%.[7] Even this reduction could be difficult to achieve for this location given the limited transit services available in the immediate project vicinity. In general, a reduction in daily VMT of 50 percent would exceed the expected level of VMT reduction from a TDM plan in a suburban area, according to the California Air Pollution Control Officers Association (CAPCOA). Therefore, the project generated VMT could be considered to have a significant unavoidable impact on the VMT in the area.

Cumulative Plus Project VMT Analysis - Since the project was found to have a significant unavoidable impact on VMT in the near-term scenario, a detailed evaluation of the project's cumulative VMT impacts was not conducted. The cumulative analysis is for determining if the Countywide VMT increases or decreases with the proposed project, relative to the VMT generated that would otherwise be generated by full General Plan buildout. Based on the data described above from the California Air Pollution Control Officers Association (CAPCOA), the project's cumulative VMT impacts would also be assumed to be significant and unavoidable

4.12 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. The proposed project not be expected to significantly impact the operating capacity any existing Sonoma Transit bus routes. The proposed project could potentially help support existing bus services with additional transit ridership and would not conflict with any transit plans or goals of the County or Sonoma Transit. 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.

4.13 Pedestrians, Bicycles and Non-Motorized Vehicular Travel

The County 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. However, consistent with the County General Plan, the project could be asked to contribute to additional pedestrian and bicycle improvement measures in the vicinity of the project.

[7] *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*, California Air Pollution Control Officers Association, August, 2010.

4.14 Site Access and Circulation

Based on the analysis of the proposed project with an event at the theater, it was determined that excessive queuing could occur on-site without improvements to the intersection of Labath Avenue with Golf Course Drive. The recommended improvements include widening Golf Course Drive to allow for a dual westbound left turn movement. The remaining intersections that would provide access to the project are forecast to have acceptable operations. The project would implement a Traffic Control Plan for 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.

4.15 Parking

The proposed project would provide an adequate supply of off-street parking based on the County's requirements. The project is currently proposing to meet the County'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.

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 Project VMT: The VMT per employee generated by the project would be greater than 85% of the countywide average VMT per employee in Sonoma County, resulting in a significant impact for the project. (Significant and Unavoidable)

The effectiveness of TDM measures for land use projects in the project area is difficult to quantify as the literature documenting the effectiveness of various mitigations indicate the maximum VMT reduction associated with the implementation of TDM strategies would not be expected to be more than 25 percent.[8] Even this reduction may be difficult to achieve given the project site's limited access to transit services. The requirement to reduce daily VMT by 50 percent in the near-term generally exceeds the expected level of VMT reduction supported by the research.

---

[8] *Quantifying Greenhouse Gas Mitigation Measures*, California Air Pollution Control Officers Association, Sacramento, CA, August, 2010.

<u>Mitigation Measure</u>

MM 1 *Preparation of a Transportation Demand Management (TDM) Plan, parallel to TDM requirements set forth by the Sonoma County Transportation Authority (SCTA).*

Impact #2 **Impacts to intersection operations - The project would contribute to LOS operations exceeding the established standards at the following six intersections under future Friday conditions with a full capacity event in the theater:**

Wilfred Avenue at Langner Avenue (Intersection #2)
Golf Course Drive at Labath Avenue (Intersection #3)
Golf Course Drive at Redwood Drive (Intersection #4)
Golf Course Drive at the U.S. 101 Southbound Ramps (Intersection #5)
Golf Course Drive at Commerce Boulevard (Intersection #6)
Commerce Boulevard at the U.S. 101 Northbound Ramps (Intersection #7)

The addition of traffic from the proposed project would contribute to these two intersections exceeding the established LOS standards. Please note that one of the impacted intersections (Intersection #5) is within the City of Rohnert Park. The impacts at this intersection involve mitigations that cannot be guaranteed to be feasible and/or acceptable to the City of Rohnert Park. Therefore, the impacts at this intersection (which occur under special event conditions only) would be considered significant and unavoidable. At Golf Course Drive and Labath Avenue (Intersection #3) the following mitigation measure would be forecast to reduce the impacts to a less-than-significant level in all plus project scenarios.

<u>Mitigation Measures</u>

MM 2 (a) *<u>Wilfred Avenue at Langner Avenue</u> – Implement manual traffic control for special events.*

MM 2 (b) *<u>Golf Course Drive at Labath Avenue</u> – Widening of Golf Course Drive to allow for a dual westbound left turn movement. Implement manual traffic control for special events.*

MM 2 (c) *<u>Golf Course Drive at Redwood Drive</u> – Restripe the eastbound right-turn lane to create an additional shared through/right lane. Construct a westbound right-turn pocket along a portion of the gas station frontage.*

MM 2 (d) *<u>Golf Course Drive at the U.S. 101 Southbound Ramps</u> – Add a second southbound right turn lane.*

MM 2 (e) *<u>Golf Course Drive at Commerce Boulevard</u> – Monitor and adjust signal systems on Golf Course Drive. Upgrade signal timing capabilities to accommodate special event traffic.*

MM 2 (f) *<u>Commerce Boulevard at the U.S. 101 Northbound Ramps</u> – Increase left turn storage on the off-ramp.*

Impact #3 **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 roadway segments currently being utilized by bus transit in the area and would not increase ridership beyond existing 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, based on the County's significance criteria 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 #4 **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 36 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 driveways 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 Golf Course Drive; 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.

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, the project could require parking for up to 1,200 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 1,250 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 150 truck trips per day.

Traffic Control Plan

The Traffic Control Plan would indicate how parking for construction workers would be provided during construction on adjacent land currently held in trust by the Tribe 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 #5 Impacts related to site access and circulation.

Based on the analysis of the proposed project with an event at the theater, it was determined that excessive queuing could occur on-site without improvements to the Labath Avenue intersection with Golf Course Drive. The recommended improvement includes widening Golf Course Drive to allow for a dual westbound left turn movement. The remaining intersections that would provide access to the project are forecast to have acceptable operations. The project would implement a Traffic Control Plan for 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 technical appendix.

<u>Mitigation Measure(s)</u>

MM 1 (a) *<u>Golf Course Drive at Labath Avenue</u> – Widening of Golf Course Drive to allow for a dual westbound left turn movement.*

Impact #6 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 an entrance on Wilfred Avenue, the main entrance on Golf Course Drive, and two entrances on Business Park Drive. 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 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.

<u>Mitigation Measure(s)</u>
None required.

Traffic Impact Study Technical Appendix

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Prepared by:
Abrams Associates
1875 Olympic Boulevard, Suite 210
Walnut Creek CA 94596

Abrams Associates
TRAFFIC ENGINEERING, INC.

March 29, 2023

Appendix
Table of Contents

FIGURE A1 | PROJECT TRIP DISTRIBUTION

TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

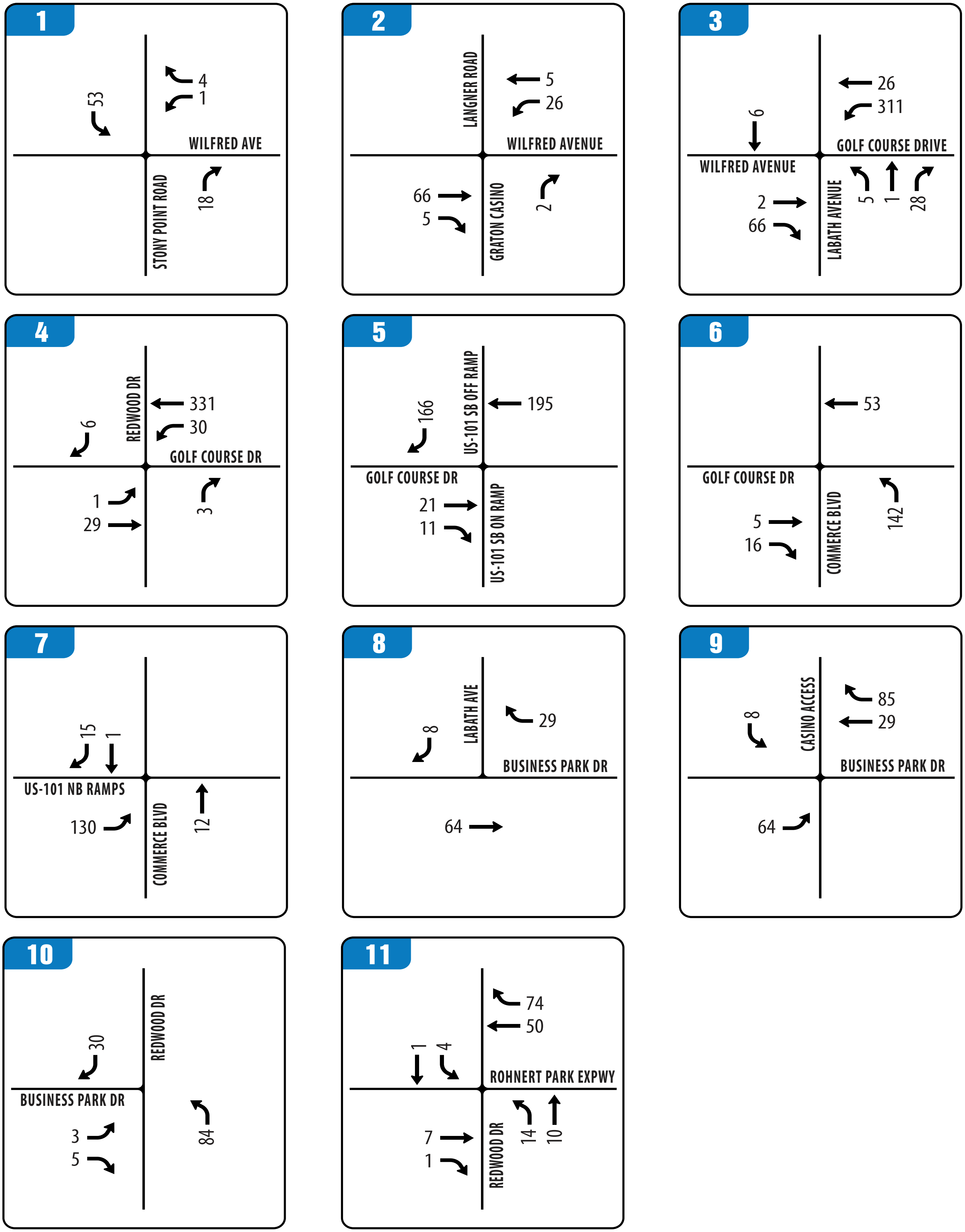


FIGURE A2 | THEATRE SPECIAL EVENT PM PEAK HOUR TRIPS

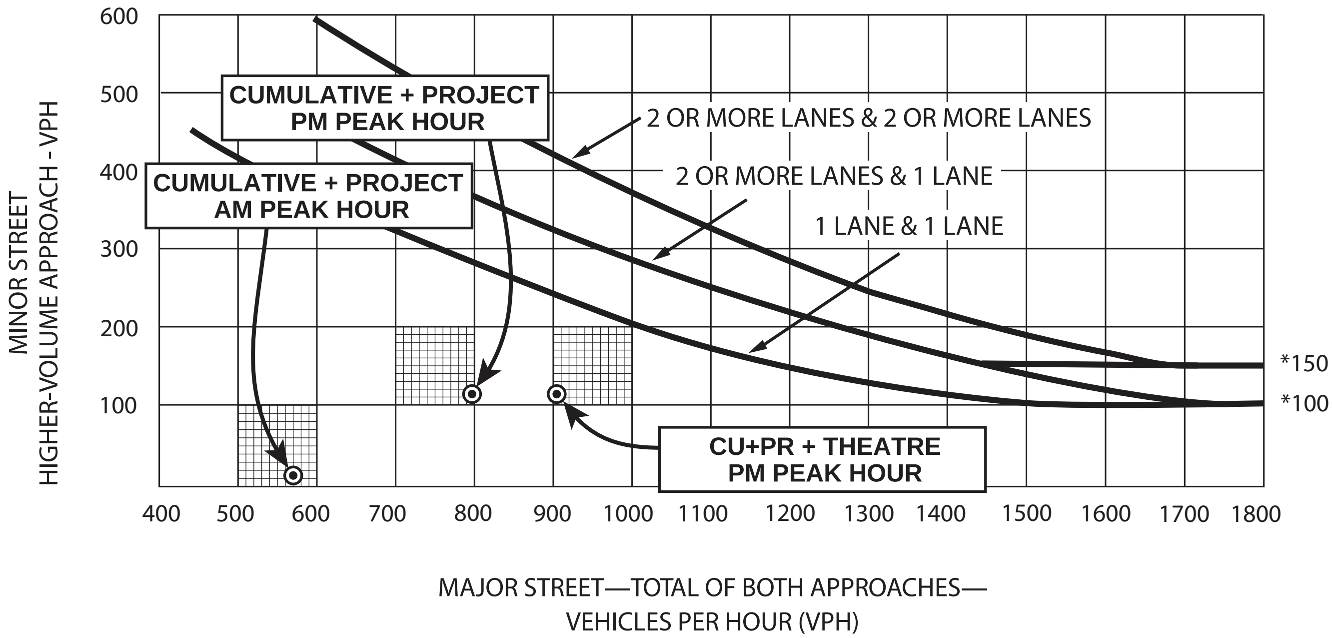
TRAFFIC IMPACT STUDY

Graton Resort & Casino Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

PEAK HOUR VOLUME WARRANT
(Urban Areas)



*** NOTE:**
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR-STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR-STREET APPROACH WITH ONE LANE.

SOURCE:
MUTCD, CHAPTER 4
(FIGURE 4C-3)

#2 - WILFRED AVENUE & LANGNER AVENUE - CUMULATIVE PLUS PROJECT & THEATRE

Graton Casino and Hotel Expansion Project

Federated Indians of Graton Rancheria

Abrams Associates
TRAFFIC ENGINEERING, INC.

Graton Casino and Hotel Expansion Project **2022-2016**
City of Rohnert Park

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
2022															
91761865	20220409	110	WILFRED AVE	LANGNER AVENUE	0	0	Y	Clear	Vehicle/Ped	Property Damage Only	0	0	Automobile Right of Way	Bicycle	0
91796724	20220609	840	WILFRED AVE	STONY POINT RD	10	E	N	Clear	Rear End	Property Damage Only	0	0	Other Improper Driving	Other Motor Vehicle	0
81690122	20220113	1921	GOLF COURSE DR W	DOWDELL AVE	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	2	Other Hazardous Violation	Other Motor Vehicle	0
81801357	20220604	2150	GOLF COURSE DR W	REDWOOD DR	162	E	N	Raining	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
91690357	20220121	1753	US-101 N/B	GOLF COURSE DR	233	S	N	Clear	Sideswipe	Property Damage Only	0	0	Unsafe Lane Change	Other Motor Vehicle	0
91765044	20220419	2055	US-101 SOUTHBOUND	GOLF COURSE DRIVE	45	S	N	Clear	Broadside	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
9379556	20220108	1938	GOLF COURSE DR W	REDWOOD DR	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
9413846	20220129	2240	GOLF COURSE DR	COMMERCE BL	40	W	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9414949	20220211	1634	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9415912	20220224	726	GOLF COURSE DR	COMMERCE BL	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
91756515	20220414	0	US-101 N/B TO COMMERCE BLVD	COMMERCE BLVD	60	W	N	Raining	Hit Object	Property Damage Only	0	0	Unsafe Speed	Fixed Object	0
91765049	20220426	2020	US-101 N/B TO COMMERCE BLVD	GOLF COURSE DR	400	S	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
91765059	20220427	2158	US-101 N/B FROM COMMERCE BLVD.	COMMERCE BLVD.	116	W	N	Clear	Sideswipe	Property Damage Only	0	0	Unsafe Lane Change	Other Motor Vehicle	0
81747576	20220102	1525	REDWOOD DR	ROHNERT PARK EXPY	423	N	N	Not Stat	Broadside	Injury (Complaint of Pain)	0	1	Automobile Right of Way	Other Motor Vehicle	0
9403869	20220102	1525	REDWOOD DR	ROHNERT PARK EXPWY	423	N	N	Not Stat	Broadside	Injury (Complaint of Pain)	0	1	Automobile Right of Way	Other Motor Vehicle	0
9414734	20220205	2017	REDWOOD DR	ROHNERT PARK EXPWY	200	N	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9431309	20220311	1856	REDWOOD DR	ROHNERT PARK EXPWY	209	N	N	Cloudy	Broadside	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	Y

Graton Casino and Hotel Expansion Project **2022-2016**

City of Rohnert Park

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
2021															
91613369	20211024	1700	STONY POINT RD	WILFRED AVE	535	S	N	Cloudy	Rear End	Injury (Complaint of Pain)	0	2	DUI	Other Motor Vehicle	Y
91661249	20211214	1717	STONY POINT ROAD	WILFRED AVE	200	S	N	Cloudy	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
81690115	20211207	1809	GOLF COURSE DR	COMMERCE BLVD	0	0	Y	Clear	Head On	Injury (Complaint of Pain)	0	2	Traffic Signals and Signs	Other Motor Vehicle	0
81690118	20211223	1251	REDWOOD DR	GOLF COURSE DR W	32	W	N	Cloudy	Broadside	Injury (Complaint of Pain)	0	1	Automobile Right of Way	Other Motor Vehicle	0
91422423	20210303	935	US 101 SB TO GOLF COURSE DR W/B	GOLF COURSE DR W/B	40	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
91469848	20210502	215	US-101 N/B GOLF COURSE DR OFF-RAMP	COMMERCE BLVD	70	S	N	Clear	Hit Object	Injury (Complaint of Pain)	0	1	DUI	Fixed Object	0
91481774	20210520	1645	US 101 SB ON RAMP FROM GOLF COURSE DR	GOLF COURSE DR	20	S	N	Clear	Sideswipe	Property Damage Only	0	0	Unsafe Lane Change	Other Motor Vehicle	0
91498079	20210607	1805	US 101 NB N GOLF COURSE DR U/C	GOLF COURSE DR U/C	50	N	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	#N/A	0
91509512	20210621	1620	US 101 NB	GOLF COURSE DR U/C	20	N	N	Clear	Sideswipe	Injury (Complaint of Pain)	0	2	Unsafe Lane Change	Other Motor Vehicle	0
91525651	20210713	1730	US 101 N/B	GOLF COURSE DR U/C	50	S	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
91576988	20210912	210	US-101 N/B TO GOLF COURSE DR	COMMERCE BLVD	55	W	N	Clear	Rear End	Property Damage Only	0	0	DUI	Other Motor Vehicle	Y
9253854	20210325	1853	GOLF COURSE DR W	LABATH AV	260	E	N	Clear	Hit Object	Property Damage Only	0	0	Unknown	Fixed Object	0
9289200	20210702	101	GOLF COURSE DR W	LABATH	0	0	Y	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0

9288518	20210625	2147	GOLF COURSE DR	REDWOOD DR	0	0	Y	Clear	Vehicle/Ped	Injury (Complaint of Pain)	0	1	Pedestrian Violation	Pedestrian	0
9240151	20210228	47	GOLF COURSE DR W	REDWOOD DR	150	E	N	Clear	Hit Object	Property Damage Only	0	0	DUI	Fixed Object	Y
9242886	20210118	1934	REDWOOD DR	GOLF COURSE DR	0	0	Y	Clear	Vehicle/Ped	Injury (Complaint of Pain)	0	1	Other than Driver (or Pedestrian)	Pedestrian	Y
9253626	20210413	2009	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
9294528	20210628	2339	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	1	Traffic Signals and Signs	Other Motor Vehicle	0
9388671	20211223	1251	REDWOOD DR	GOLF COURSE DR W	32	W	N	Cloudy	Broadside	Injury (Complaint of Pain)	0	1	Automobile Right of Way	Other Motor Vehicle	0
91525849	20210717	0	US-101 NORTHBOUND TO COMMERCE BLVD	COMMERCE DRIVE	40	S	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
91671182	20211224	2050	US-101 N/B TO COMMERCE BLVD	COMMERCE BLVD	60	W	N	Raining	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	Y
9342949	20210907	808	GOLF COURSE DR	COMMERCE BL	59	E	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Starting or Backing	Other Motor Vehicle	0
9385221	20211207	1809	GOLF COURSE DR	COMMERCE BL	0	0	Y	Clear	Head On	Injury (Complaint of Pain)	0	2	Traffic Signals and Signs	Other Motor Vehicle	0
9208722	20210101	950	REDWOOD DR	ROHNERT PARK EXPWY	15	N	N	Clear	Sideswipe	Property Damage Only	0	0	DUI	Other Motor Vehicle	0
9247548	20210402	730	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Sideswipe	Injury (Complaint of Pain)	0	1	Traffic Signals and Signs	Other Motor Vehicle	0
9261246	20210413	1508	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9275833	20210512	1400	REDWOOD DR	ROHNERT PARK EXPWY	72	N	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9293880	20210715	1920	ROHNERT PARK EXPWY	E REDWOOD DR	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
9326611	20210808	1536	REDWOOD DR	ROHNERT PARK EXPWY	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9378901	20211111	1551	ROHNERT PARK EXPWY	REDWOOD DR	157	W	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0

Graton Casino and Hotel Expansion Project **2022-2016**

City of Rohnert Park

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
2020															
91181862	20200205	1130	STONY POINT ROAD	WILFRED AVENUE	20	S	N	Clear	Other	Property Damage Only	0	0	Other Hazardous Violation	Other Object	0
91321506	20201004	1540	STONY POINT RD	WILFRED AVE	0	0	Y	Clear	Broadside	Property Damage Only	0	0	Other Hazardous Violation	Other Motor Vehicle	Y
91299298	20200902	1045	GOLF COURSE DRIVE	LA BATH AVE.	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
9207517	20201127	2330	GOLF COURSE DR W	LABATH AV	13	E	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Non-Collision	Y
9079235	20200211	846	GOLF COURSE DR	COMMERCE BL	139	W	N	Clear	Sideswipe	Property Damage Only	0	0	#N/A	Other Motor Vehicle	0
9105090	20200218	812	COMMERCE BL	GOLF COURSE DR	90	N	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9108624	20200520	2018	COMMERCE BL	GOLF COURSE DR	60	N	N	Clear	Sideswipe	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
91281477	20200711	309	US-101 N/B TO GOLF COURSE DR	COMMERCE BLVD	75	S	N	Clear	Hit Object	Injury (Complaint of Pain)	0	1	Unsafe Speed	Fixed Object	0
9162079	20200920	1130	GOLF COURSE DR	COMMERCE BL	42	E	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
9233290	20201221	503	GOLF COURSE DR	COMMERCE BL	0	0	Y	Fog	Broadside	Property Damage Only	0	0	Traffic Signals and Signs	Other Motor Vehicle	0
9036326	20200110	1818	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	1	Improper Turning	Other Motor Vehicle	0
9039908	20200118	2020	GOLF COURSE DR	REDWOOD	0	0	Y	Clear	Broadside	Property Damage Only	0	0	Traffic Signals and Signs	Other Motor Vehicle	0
9148559	20200829	2323	GOLF COURSE DR W	REDWOOD DR	214	W	N	Clear	Rear End	Injury (Complaint of Pain)	0	2	DUI	Other Motor Vehicle	Y
9095314	20200414	2027	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
9183610	20201127	1336	REDWOOD DR	GOLF COURSE DR W	257	S	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0

9221644	20201231	1530	GOLF COURSE DR	RT 101	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	1	Traffic Signals and Signs	Other Motor Vehicle	0
91170950	20200113	850	US-101 SB TO GOLF COURSE DRIVE	GOLF COURSE DRIVE	335	N	N	Cloudy	Rear End	Injury (Other Visible)	0	3	Unsafe Speed	Other Motor Vehicle	0
91171534	20200121	1450	U.S. 101 S/B ONRAMP	GOLF COURSE DR	70	N	N	Cloudy	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
91175701	20200122	1220	US-101 S/B TO GOLF COURSE DRIVE	GOLF COURSE DRIVE	200	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
91360853	20201202	640	US 101 S/B FROM GOLF COURSE DR	GOLF COURSE DR	25	S	N	Cloudy	Sideswipe	Property Damage Only	0	0	Unsafe Lane Change	Other Motor Vehicle	0
91359840	20201122	1730	US-101 S/B TO GOLF COURSE DR	GOLF COURSE DRIVE	345	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
91360375	20201204	1430	US-101 S/B TO GOLF COURSE DRIVE	GOLF COURSE DRIVE	350	N	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
91369044	20201213	1550	S/B US-101	GOLF COURSE DRIVE	85	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
91342648	20201105	1754	US-101 NB	GOLF COURSE DR	300	S	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
91345568	20201105	1818	US-101 N/B	GOLF COURSE DR U/C	50	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Motor Vehicle on othe	0
91281477	20200711	309	US-101 N/B TO GOLF COURSE DR	COMMERCE BLVD	75	S	N	Clear	Hit Object	Injury (Complaint of Pain)	0	1	Unsafe Speed	Fixed Object	0
91332397	20201022	1625	U.S.-101 N/B OFFRAMP	COMMERCE BLVD	100	W	N	Clear	Rear End	Injury (Other Visible)	0	2	DUI	Other Motor Vehicle	Y
91356924	20200916	535	US 101 N/B TO COMMERACE BLVD S/B	COMMERCE BLVD	95	W	N	Cloudy	Sideswipe	Property Damage Only	0	0	Improper Turning	Fixed Object	Y
9071073	20200219	1914	ROHNERT PARK EXPWY	REDWOOD DR	214	E	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
9123469	20200606	1604	REDWOOD DR	ROHNERT PARK EXPWY	316	N	N	Clear	Other	Injury (Complaint of Pain)	0	1	Improper Turning	Motor Vehicle on othe	0
9124194	20200627	1516	REDWOOD DR	ROHNERT PARK EXPWY	71	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Starting or Backing	Other Motor Vehicle	0
9134043	20200430	1520	ROHNERT PARK EXPWY	REDWOOD DR	150	W	N	Clear	Broadside	Injury (Severe)	0	1	Automobile Right of Way	Other Motor Vehicle	0
9144325	20200814	814	REDWOOD RD	ROHNERT PARK EXPWY	299	S	N	Clear	Sideswipe	Injury (Complaint of Pain)	0	1	Improper Passing	Other Motor Vehicle	0
9177218	20201012	1646	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
9210731	20201217	1802	ROHNERT PARK EXPWY	REDWOOD DR	220	E	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0

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
2019															
91034042	20190717	1320	STONY POINT RD	WILFRED AVE	36	N	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
91151633	20191214	805	STONY POINT RD	WILFRED AVE	19	S	N	Cloudy	Hit Object	Property Damage Only	0	0	DUI	Other Object	Y
8924640	20190614	1258	GOLF COURSE DR W	LABATH AV	83	E	N	Clear	Rear End	Injury (Complaint of Pain)	0	3	Unsafe Speed	Other Motor Vehicle	0
9030463	20191117	1204	GOLF COURSE DR W	LABATH AV	185	E	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
8845743	20190320	2304	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	1	Traffic Signals and Signs	Other Motor Vehicle	0
8934540	20190705	1400	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
9004667	20191119	1724	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Head On	Property Damage Only	0	0	Traffic Signals and Signs	Other Motor Vehicle	0
9015041	20191215	2122	GOLF COURSE DR	REDWOOD DR	246	W	N	Cloudy	Sideswipe	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
9020850	20191111	1927	GOLF COURSE DR W	REDWOOD DR	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Unknown	Other Motor Vehicle	0
9036252	20191226	2205	GOLF COURSE DR	REDWOOD DR	0	0	Y	Clear	Other	Injury (Complaint of Pain)	0	1	Pedestrian Violation	Bicycle	0

8846942	20190502	1110	GOLF COURSE DR	COMMERCE BL	79	E	N	Clear	Sideswipe	Property Damage Only	0	0	Improper Passing	Other Motor Vehicle	0
8854577	20190502	930	GOLF COURSE DR	COMMERCE BL	0	0	Y	Clear	Other	Injury (Other Visible)	0	1	Improper Turning	Bicycle	0
8860366	20190516	1336	GOLF COURSE DR	COMMERCE BL	98	W	N	Raining	Hit Object	Property Damage Only	0	0	Unsafe Speed	Other Object	0
90964731	20190405	350	US-101 N/B TO GOLF COURSE DR	COMMERCE BLVD	95	S	N	Cloudy	Hit Object	Property Damage Only	0	0	DUI	Fixed Object	Y
91151319	20191214	1920	US-101 S/B TO GOLF COURSE DRIVE	COMMERCE BLVD	200	N	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
90974089	20190419	130	US-101 N/B TO GOLFCOURSE DRIVE	COMMERCE BLVD	150	S	N	Clear	Hit Object	Property Damage Only	0	0	DUI	Fixed Object	Y
9034336	20191212	1445	COMMERCE BL	GOLF COURSE DR	0	0	Y	Cloudy	Broadside	Property Damage Only	0	0	Traffic Signals and Signs	Other Motor Vehicle	0
8933557	20190824	141	RT 101	COMMERCE BL	0	0	Y	Clear	Hit Object	Property Damage Only	0	0	DUI	Fixed Object	Y
91046431	20190802	1432	US-101 N/B	COMMERCE BLVD	10	S	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Following too Closely	Other Motor Vehicle	0
91101565	20191015	1510	US-101 N/B FROM COMMERCE BLVD	COMMERCE BLVD	100	N	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
91128556	20191114	1740	US-101 N/B	COMMERCE BLVD	528	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0

8809014	20190228	1843	REDWOOD DR	BUSINESS PARK DR	30	N	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	Y
8805811	20190116	2131	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Raining	Broadside	Property Damage Only	0	0	Traffic Signals and Signs	Other Motor Vehicle	0
8810179	20190201	1639	REDWOOD DR	ROHNERT PARK EXPWY	197	N	N	Cloudy	Broadside	Injury (Complaint of Pain)	0	1	Automobile Right of Way	Other Motor Vehicle	0
8903368	20190710	900	ROHNERT PARK EXPWY	REDWOOD DR	41	E	N	Clear	Sideswipe	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
8910637	20190628	1304	ROHNERT PARK EXPWY	REDWOOD DR	84	E	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
8924616	20190619	1523	REDWOOD DR	ROHNERT PARK EXPWY	0	0	Y	Clear	Head On	Injury (Complaint of Pain)	0	3	Automobile Right of Way	Other Motor Vehicle	0
8936195	20190721	1520	ROHNERT PARK EXPWY	REDWOOD DR	20	E	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
8937960	20190829	1055	REDWOOD DR	ROHNERT PARK EXPWY	40	N	N	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8955629	20190923	1306	REDWOOD DR	ROHNERT PARK EXPWY	331	N	N	Clear	Sideswipe	Property Damage Only	0	0	Improper Passing	Other Motor Vehicle	0
8970267	20191012	2008	ROHNERT PARK EXPWY	REDWOOD DR	10	E	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
8982769	20191102	2205	REDWOOD DR	ROHNERT PARK EXPWY	10	N	N	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8994335	20191102	754	ROHNERT PARK EXPWY	REDWOOD DR	37	E	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Following too Closely	Other Motor Vehicle	0
9001334	20191130	1350	ROHNERT PARK EXPWY	REDWOOD DR	230	E	N	Cloudy	Rear End	Injury (Complaint of Pain)	0	3	Unsafe Speed	Other Motor Vehicle	0

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
2018															
90632824	20180103	1655	STONYPOINT RD.	WILFRED AVE	0	0	Y	Cloudy	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90745735	20180601	1745	STONY POINT ROAD	WILFRED AVE	230	S	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90761636	20180625	1200	STONY POINT ROAD	WILFRED AVE	400	S	N	Clear	Hit Object	Property Damage Only	0	0	Other Hazardous Violation	Other Object	0
90885944	20181213	630	STONY POINT RD	WILFRED AVE	215	N	N	Clear	Hit Object	Injury (Complaint of Pain)	0	1	Improper Turning	Other Object	0
8629260	20180531	1056	GOLF COURSE DR	REDWOOD DR	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Unsafe Starting or Backing	Other Motor Vehicle	0
8649325	20180621	1550	GOLF COURSE DR	REDWOOD DR	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Non-Collision	0
8684305	20180728	1600	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
8684309	20180731	1255	GOLF COURSE DR W	REDWOOD DR	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8700464	20180903	2151	GOLF COURSE DR W	REDWOOD DR	12	E	N	Clear	Hit Object	Property Damage Only	0	0	DUI	Fixed Object	Y
8590676	20180318	243	GOLF COURSE DR	RT 101	41	W	N	Fog	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	Y
8597810	20180328	1536	GOLF COURSE DR	RT 101	30	E	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	Y
8615810	20180406	1525	GOLF COURSE DR	RT 101	128	W	N	Raining	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
8722050	20181018	1949	GOLF COURSE DR	RT 101	71	E	N	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8748871	20181127	1405	GOLF COURSE DR	RT 101	0	0	Y	Raining	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0

90637342	20180108	1315	U.S.-101 S/B OFFRAMP TO GOLF COURSE DR.	GOLF COURSE DR	300	N	N	Cloudy	Rear End	Injury (Other Visible)	0	1	Unsafe Speed	Other Motor Vehicle	0
90646461	20180123	1820	US-101 S/B TO GOLF COURSE DRIVE	GOLF COURSE DR	25	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90697088	20180325	1430	US-101 S/B TO GOLF COURSE DRIVE	GOLF COURSE DRIVE	60	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90698793	20180328	1240	US-101 S/B TO GOLF COURSE DRIVE	GOLF COURSE DR	65	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90804619	20180823	1844	US-101 S/B	GOLF COURSE DR	12	S	N	Clear	Sideswipe	Injury (Complaint of Pain)	0	2	Unsafe Lane Change	Other Motor Vehicle	0
90836331	20181005	1445	US-101 S/B GOLF COURSE OFFRAMP	GOLF COURSE DRIVE	480	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90849418	20181024	2110	US-101 S/B FROM GOLF COURSE DRIVE	GOLF COURSE DRIVE	25	S	N	Clear	Sideswipe	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
90859874	20181102	840	US-101 N/B	GOLF COURSE DR	80	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90835099	20181005	1535	US-101 N/B	GOLF COURSE DR. WEST	2	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90881493	20181207	1815	US-101 S/B TO GOLF COURSE DRIVE	GOLF COURSE DR	100	N	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Starting or Backing	Other Motor Vehicle	0

Graton Casino and Hotel Expansion Project **2022-2016**

City of Rohnert Park

8547107	20180119	1041	COMMERCE BL	GOLF COURSE DR	130	S	N	Clear	Rear End	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8547271	20180129	2221	COMMERCE BL	GOLF COURSE DR	0	0	Y	Clear	Rear End	Injury (Complaint of Pain)	0	1	DUI	Other Motor Vehicle	Y
8598245	20180216	1621	COMMERCE BL	GOLF COURSE DR	257	S	N	Clear	Rear End	Injury (Complaint of Pain)	0	3	Unsafe Speed	Other Motor Vehicle	0
8615757	20180407	2340	GOLF COURSE DR	COMMERCE BL	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	2	DUI	Other Motor Vehicle	Y
8632385	20180524	1225	GOLF COURSE DR	COMMERCE BL	0	0	Y	Cloudy	Rear End	Injury (Complaint of Pain)	0	2	Unsafe Starting or Backing	Other Motor Vehicle	0
8664483	20180705	1930	GOLF COURSE DR	COMMERCE	30	W	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
8693678	20180819	1545	COMMERCE BL	GOLF COURSE DR	75	N	N	Clear	Sideswipe	Property Damage Only	0	0	Unknown	Other Motor Vehicle	Y
8733098	20180915	243	GOLF COURSE DR	COMMERCE BL	0	0	Y	Cloudy	Broadside	Property Damage Only	0	0	DUI	Other Motor Vehicle	Y
8765380	20181208	1336	GOLF COURSE DR	COMMERCE BL	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Unknown	Other Motor Vehicle	0
90785153	20180725	2350	COMMERCE BLVD	GOLF COURSE DR	25	S	N	Clear	Sideswipe	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
90655875	20180131	822	US-101 N/B	COMMERCE BLVD. U/C	100	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90671098	20180222	810	US-101 N/B	COMMERCE BLVD	100	N	N	Clear	Sideswipe	Property Damage Only	0	0	Unsafe Lane Change	Other Motor Vehicle	0
90682259	20180309	640	US-101 S/B	COMMERCE BLVD	200	S	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90687327	20180314	1720	U.S.-101 NB FROM COMMERCE BLVD	COMMERCE BLVD	80	W	N	Cloudy	Sideswipe	Property Damage Only	0	0	Unsafe Starting or Backing	Other Motor Vehicle	0

8780553	20181206	1554	REDWOOD DR	BUSINESS PARK DR	250	N	N	Clear	Rear End	Injury (Severe)	0	1	Unsafe Speed	Other Motor Vehicle	0
8504670	20180105	1736	REDWOOD DR	ROHNERT PARK EXPWY	0	0	Y	Clear	Other	Injury (Complaint of Pain)	0	1	Traffic Signals and Signs	Bicycle	0
8539140	20180117	1426	ROHNERT PARK EXPWY	REDWOOD DR	127	E	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Following too Closely	Other Motor Vehicle	0
8561979	20180113	714	REDWOOD DR	ROHNERT PARK EXPWY	0	0	Y	Cloudy	Vehicle/Ped	Injury (Complaint of Pain)	0	1	Pedestrian Right of Way	Pedestrian	0
8578721	20180313	550	ROHNERT PARK EXPWY	REDWOOD DR	50	W	N	Raining	Vehicle/Ped	Injury (Other Visible)	0	1	Pedestrian Violation	Pedestrian	0
8597325	20180330	1553	REDWOOD DR	ROHNERT PARK EXPWY	217	N	N	Clear	Broadside	Injury (Complaint of Pain)	0	1	Improper Turning	Other Motor Vehicle	0
8599364	20180129	1853	ROHNERT PARK EXPWY	REDWOOD DR	127	E	N	Clear	Sideswipe	Injury (Complaint of Pain)	0	1	Improper Turning	Other Motor Vehicle	0
8649457	20180716	1422	REDWOOD DR	ROHNERT PARK EXPWY	150	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Starting or Backing	Other Motor Vehicle	Y
8652038	20180811	1130	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	1	Traffic Signals and Signs	Other Motor Vehicle	0
8659815	20180628	1435	REDWOOD DR	ROHNERT PARK EXPWY	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
8663991	20180607	2208	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
8672584	20180523	1718	REDWOOD DR	ROHNERT PARK EXPWY	200	N	N	Cloudy	Broadside	Injury (Complaint of Pain)	0	1	Automobile Right of Way	Other Motor Vehicle	0
8715993	20180927	1559	REDWOOD DR	ROHNERT PARK EXPWY	155	N	N	Clear	Sideswipe	Injury (Complaint of Pain)	0	1	Improper Turning	Other Motor Vehicle	0
8734513	20181006	1459	ROHNERT PARK EXPWY	REDWOOD DR	250	E	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
8737577	20181029	1746	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	2	Automobile Right of Way	Other Motor Vehicle	0
8751685	20181105	1230	REDWOOD DR	ROHNERT PARK EXPWY	3	N	N	Clear	Sideswipe	Injury (Complaint of Pain)	0	1	Other than Driver (or Pedestrian)	Other Motor Vehicle	0
8751977	20181016	1615	REDWOOD DR	ROHNERT PARK EXPWY	212	N	N	Clear	Broadside	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
8755915	20181206	1928	ROHNERT PARK EXPWY	REDWOOD DR	50	W	N	Clear	Rear End	Property Damage Only	0	0	DUI	Other Motor Vehicle	Y
8769017	20181215	2159	ROHNERT PARK EXPWY	REDWOOD DR	300	E	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0

Graton Casino and Hotel Expansion Project **2022-2016**

City of Rohnert Park

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
2017															
90566647	20170930	2225	STONY POINT ROAD	WILFRED AVE	150	N	N	Clear	Sideswipe	Property Damage Only	0	0	Wrong Side of Road	Other Motor Vehicle	0
90575861	20171014	1350	STONY POINT RD.	WILFRED AVE	117	S	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90508335	20170719	1605	WILFRED AVE	LANGNER AVE	0	0	Y	Clear	Broadside	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
90497924	20170702	2250	LABATH AVENUE	WILFRED AVENUE	200	N	N	Clear	Other	Property Damage Only	0	0	Other than Driver (or Pedestrian)	Non-Collision	0
8331200	20170314	959	GOLF COURSE DR W	LABATH AV	267	E	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
8348030	20170327	758	GOLF COURSE DR W	LABATH AV	0	0	Y	Clear	Vehicle/Pede	Injury (Complaint of Pain)	0	1	Traffic Signals and Signs	Bicycle	0
8416035	20170703	1900	GOLF COURSE DR W	LABATH AV	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8314503	20170109	27	GOLF COURSE DR	REDWOOD DR	252	E	N	Raining	Hit Object	Property Damage Only	0	0	Unsafe Speed	Fixed Object	Y
8366899	20170420	1753	GOLF COURSE DR	REDWOOD DR	40	E	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
8486693	20171025	1755	GOLF COURSE DR	REDWOOD DR	210	W	N	Clear	Broadside	Injury (Complaint of Pain)	0	1	Improper Turning	Other Motor Vehicle	0
8499015	20171110	1745	REDWOOD DR	GOLF COURSE DR W	60	N	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	Y
8339369	20170212	10	GOLF COURSE DR	COMMERCE BL	0	0	Y	Clear	Overturned	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8406832	20170625	1811	COMMERCE BL	GOLF COURSE DR	200	N	N	Clear	Hit Object	Property Damage Only	0	0	DUI	Fixed Object	Y
8429958	20170722	1300	GOLF COURSE DR	COMMERCE BL	150	W	N	Clear	Other	Property Damage Only	0	0	Other Hazardous Violation	Other Object	0
8441300	20170824	1130	COMMERCE BL	GOLF COURSE DR	75	N	N	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	Y
8526915	20171212	1219	GOLF COURSE DR	COMMERCE BL	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
90554656	20170915	2240	US-101 NB TO GOLF COURSE DR.	COMMERCE BLVD	131	W	N	Clear	Hit Object	Property Damage Only	0	0	Unsafe Speed	Fixed Object	0
8345929	20170321	650	COMMERCE BL	RT 101	0	0	Y	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0

8390460	20170602	935	COMMERCE BL	RT 101	0	0	Y	Clear	Broadside	Property Damage Only	0	0	Traffic Signals and Signs	Other Motor Vehicle	0
8486183	20171008	1708	RT 101	COMMERCE BL	0	0	Y	Clear	Hit Object	Injury (Other Visible)	0	1	Unsafe Speed	Other Object	Y
90426001	20170325	259	US-101 TO COMMERCE BLVD.	COMMERCE BLVD	79	S	N	Clear	Rear End	Injury (Other Visible)	0	5	DUI	Other Motor Vehicle	0
90537486	20170828	800	US-101 N/B	COMMERCE BLVD	54	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90554266	20170920	1555	US-101 N/B	COMMERCE BLVD	22	N	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90584718	20171026	1530	US-101 N/B	COMMERCE BOULEVARD (U/C)	50	N	N	Clear	Rear End	Property Damage Only	0	0	Following too Closely	Other Motor Vehicle	0
8314480	20170202	1400	REDWOOD DR	ROHNERT PARK EXPWY	100	N	N	Raining	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
8315899	20170225	230	REDWOOD DR	ROHNERT PARK EXPY	0	0	Y	Clear	Hit Object	Injury (Complaint of Pain)	0	1	DUI	Fixed Object	Y
8321573	20170227	1804	REDWOOD DR	ROHNERT PARK EXPWY	141	N	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
8351720	20170413	104	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Raining	Broadside	Property Damage Only	0	0	DUI	Other Motor Vehicle	0
8356255	20170413	2207	ROHNERT PARK EXPWY	REDWOOD DR	10	E	N	Clear	Rear End	Property Damage Only	0	0	Unknown	Other Motor Vehicle	Y
8358410	20170327	730	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Head On	Injury (Complaint of Pain)	0	1	Traffic Signals and Signs	Other Motor Vehicle	0
8362480	20170426	2139	ROHNERT PARK EXPWY	REDWOOD DR	100	E	N	Clear	Sideswipe	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8380982	20170515	1211	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Broadside	Property Damage Only	0	0	Traffic Signals and Signs	Other Motor Vehicle	0
8421768	20170622	1040	REDWOOD DR	ROHNERT PARK EXPWY	10	N	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
8440152	20170809	720	ROHNERT PARK EXPWY	REDWOOD DR	80	W	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Starting or Backing	Other Motor Vehicle	0
8506489	20171108	1601	REDWOOD DR	ROHNERT PARK EXPWY	0	0	Y	Raining	Rear End	Injury (Complaint of Pain)	0	1	DUI	Other Motor Vehicle	0
8527384	20171201	2326	ROHNERT PARK EXPWY	REDWOOD DR	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0

Graton Casino and Hotel Expansion Project **2022-2016**
City of Rohnert Park

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
2016															
90105116	20160115	750	STONY POINT RD	WILFRED AVE	25	S	N	Fog	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
90133540	20160229	1620	STONY POINT RD	WILFRED AVE	275	S	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
90139664	20160315	735	STONY POINT RD	WILFRED AVE	150	S	N	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90251854	20160727	1420	STONY POINT RD	WILFRED AVE	0	0	Y	Clear	Head On	Injury (Other Visible)	0	1	Unknown	Other Motor Vehicle	0
90341985	20161201	1805	STONY POINT RD	WILFRED AVE	1056	N	N	Clear	Broadside	Injury (Complaint of Pain)	0	2	Automobile Right of Way	Other Motor Vehicle	0
90277623	20160919	1955	WILFRED AVE	STONY POINT RD	0	0	Y	Clear	Broadside	Injury (Complaint of Pain)	0	1	Automobile Right of Way	Other Motor Vehicle	0
90233028	20160723	2130	WILFRED AVE	LANGNER AVE	0	0	Y	Clear	Broadside	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
90110797	20160122	1948	GOLF COURSE DRIVE WEST	LABATH AVE	100	E	N	Cloudy	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90134667	20160304	2039	GOLF COURSE DRIVE WEST	LABATH AVENUE	100	E	N	Cloudy	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
90237268	20160720	25	GOLF COURSE DRIVE	LABATH AVENUE	491	E	N	Clear	Vehicle/Ped	Injury (Severe)	0	1	Pedestrian Violation	Pedestrian	Y
7209212	20160210	1409	REDWOOD DR	GOLF COURSE DR W	0	0	Y	Clear	Broadside	Property Damage Only	0	0	Automobile Right of Way	Other Motor Vehicle	0
90160667	20160409	2135	US-101 N/B FROM COMMERCE BLVD	GOLF COURSE DR	144	S	N	Raining	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
90237157	20160711	600	US-101 N/B FROM GOLF COURSE DR.	COMMERCE BLVD	146	W	N	Clear	Hit Object	Property Damage Only	0	0	Improper Turning	Fixed Object	0
7148682	20160107	1600	COMMERCE BL	RT 101	0	0	Y	Clear	Broadside	Property Damage Only	0	0	Improper Turning	Other Motor Vehicle	0
8040155	20160221	1813	RT 101	COMMERCE BL	0	0	Y	Clear	Rear End	Property Damage Only	0	0	Unsafe Speed	Other Motor Vehicle	0
8179952	20161129	1842	COMMERCE BL	RT 101	0	0	Y	Clear	Head On	Property Damage Only	0	0	Traffic Signals and Signs	Other Motor Vehicle	0
90278367	20160919	827	US-101	COMMERCE BLVD	528	N	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
90284979	20161003	800	US-101 N/B FROM COMMERCE BLVD	COMMERCE BLVD	78	W	N	Cloudy	Hit Object	Property Damage Only	0	0	Unsafe Speed	Fixed Object	0
90353199	20161221	1335	US-101 N/B TO COMMERCE BLVD	COMMERCE BLVD	40	W	N	Clear	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0
8036635	20160313	1204	COMMERCE BL	GOLF COURSE DR	30	S	N	Raining	Rear End	Injury (Complaint of Pain)	0	1	Unsafe Speed	Other Motor Vehicle	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	5	4	76	4	90	0	349	46	132	379	6
Future Volume (veh/h)	6	5	4	76	4	90	0	349	46	132	379	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	7	5	4	83	4	98	0	379	50	143	412	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	207	101	50	387	10	200	5	568	75	195	1092	19
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.00	0.35	0.35	0.11	0.60	0.60
Sat Flow, veh/h	396	793	396	1365	82	1572	1767	1606	212	1767	1819	31
Grp Volume(v), veh/h	16	0	0	87	0	98	0	0	429	143	0	419
Grp Sat Flow(s),veh/h/ln	1584	0	0	1448	0	1572	1767	0	1817	1767	0	1850
Q Serve(g_s), s	0.0	0.0	0.0	1.4	0.0	1.9	0.0	0.0	6.6	2.6	0.0	3.9
Cycle Q Clear(g_c), s	1.7	0.0	0.0	1.8	0.0	1.9	0.0	0.0	6.6	2.6	0.0	3.9
Prop In Lane	0.44		0.25	0.95		1.00	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	358	0	0	397	0	200	5	0	642	195	0	1110
V/C Ratio(X)	0.04	0.00	0.00	0.22	0.00	0.49	0.00	0.00	0.67	0.73	0.00	0.38
Avail Cap(c_a), veh/h	1277	0	0	1264	0	1166	267	0	3107	1364	0	4311
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	0.0	13.3	0.0	13.4	0.0	0.0	9.0	14.2	0.0	3.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	1.8	0.0	0.0	1.2	5.2	0.0	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	0.1	0.0	0.0	0.5	0.0	0.6	0.0	0.0	1.9	1.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	0.0	0.0	13.6	0.0	15.3	0.0	0.0	10.2	19.4	0.0	3.6
LnGrp LOS	B	A	A	B	A	B	A	A	B	B	A	A
Approach Vol, veh/h		16			185			429			562	
Approach Delay, s/veh		12.7			14.5			10.2			7.6	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	16.2		8.7	0.0	24.3		8.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	25.5	56.5		24.5	5.0	77.0		24.5				
Max Q Clear Time (g_c+I1), s	4.6	8.6		3.7	0.0	5.9		3.9				
Green Ext Time (p_c), s	0.4	3.1		0.0	0.0	3.0		0.7				
Intersection Summary												
HCM 6th Ctrl Delay			9.7									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	184	4	20	173	5	0	0	4	2	0	0
Future Vol, veh/h	1	184	4	20	173	5	0	0	4	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	200	4	22	188	5	0	0	4	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	193	0	0	204	0	0	439	441	202	441	441	191
Stage 1	-	-	-	-	-	-	204	204	-	235	235	-
Stage 2	-	-	-	-	-	-	235	237	-	206	206	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1374	-	-	1362	-	-	526	509	836	525	509	848
Stage 1	-	-	-	-	-	-	796	731	-	766	709	-
Stage 2	-	-	-	-	-	-	766	707	-	794	729	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1374	-	-	1362	-	-	519	500	836	516	500	848
Mov Cap-2 Maneuver	-	-	-	-	-	-	519	500	-	516	500	-
Stage 1	-	-	-	-	-	-	795	730	-	765	698	-
Stage 2	-	-	-	-	-	-	754	696	-	789	728	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.8	9.3	12
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	836	1374	-	-	1362	-	-	516
HCM Lane V/C Ratio	0.005	0.001	-	-	0.016	-	-	0.004
HCM Control Delay (s)	9.3	7.6	0	-	7.7	-	-	12
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	145	44	164	179	1	17	1	79	2	1	1
Future Volume (veh/h)	1	145	44	164	179	1	17	1	79	2	1	1
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	1	158	48	178	195	1	18	1	86	2	1	1
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	7	517	152	254	618	3	427	16	395	288	58	41
Arrive On Green	0.00	0.19	0.19	0.14	0.34	0.34	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	2686	790	1767	1844	9	1291	149	1572	608	538	382
Grp Volume(v), veh/h	1	102	104	178	0	196	19	0	86	4	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1713	1767	0	1854	1440	0	1572	1527	0	0
Q Serve(g_s), s	0.0	1.2	1.3	2.3	0.0	1.9	0.2	0.0	1.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.2	1.3	2.3	0.0	1.9	0.3	0.0	1.1	0.0	0.0	0.0
Prop In Lane	1.00		0.46	1.00		0.01	0.95		1.00	0.50		0.25
Lane Grp Cap(c), veh/h	7	339	330	254	0	621	443	0	395	386	0	0
V/C Ratio(X)	0.14	0.30	0.32	0.70	0.00	0.32	0.04	0.00	0.22	0.01	0.00	0.00
Avail Cap(c_a), veh/h	692	1925	1871	2585	0	4011	1727	0	1814	1717	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.1	8.4	8.4	9.9	0.0	6.0	9.8	0.0	7.2	9.7	0.0	0.0
Incr Delay (d2), s/veh	8.3	0.5	0.5	3.5	0.0	0.3	0.0	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	0.0	0.3	0.3	0.8	0.0	0.4	0.1	0.0	0.2	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	8.9	9.0	13.4	0.0	6.3	9.8	0.0	7.5	9.7	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		207			374			105			4	
Approach Delay, s/veh		9.0			9.7			7.9			9.7	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.1	8.0	9.2		7.1	4.5	12.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		24.5	35.5	26.5		24.5	9.5	52.5				
Max Q Clear Time (g_c+I1), s		3.1	4.3	3.3		2.0	2.0	3.9				
Green Ext Time (p_c), s		0.3	0.5	1.1		0.0	0.0	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			9.2									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	168	51	237	348	135	39	57	175	161	72	47
Future Volume (veh/h)	24	168	51	237	348	135	39	57	175	161	72	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	26	183	55	258	378	147	42	62	190	175	78	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	55	574	256	442	650	249	81	573	458	236	883	394
Arrive On Green	0.03	0.16	0.16	0.13	0.26	0.26	0.05	0.16	0.16	0.13	0.25	0.25
Sat Flow, veh/h	1767	3526	1572	3428	2491	955	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	26	183	55	258	266	259	42	62	190	175	78	51
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1684	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	0.6	2.0	1.3	3.1	5.7	5.9	1.0	0.7	4.3	4.2	0.7	1.1
Cycle Q Clear(g_c), s	0.6	2.0	1.3	3.1	5.7	5.9	1.0	0.7	4.3	4.2	0.7	1.1
Prop In Lane	1.00		1.00	1.00		0.57	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	55	574	256	442	460	439	81	573	458	236	883	394
V/C Ratio(X)	0.48	0.32	0.21	0.58	0.58	0.59	0.52	0.11	0.41	0.74	0.09	0.13
Avail Cap(c_a), veh/h	384	2058	918	1766	1554	1484	465	1897	1049	1234	3430	1530
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	20.8	16.1	15.9	17.9	14.1	14.1	20.4	15.6	12.5	18.2	12.5	12.7
Incr Delay (d2), s/veh	6.3	0.3	0.4	1.2	1.2	1.3	5.1	0.1	0.6	4.5	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	0.3	0.7	0.4	1.1	2.0	2.0	0.5	0.2	1.3	1.8	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	16.5	16.3	19.1	15.2	15.4	25.5	15.7	13.1	22.7	12.6	12.8
LnGrp LOS	C	B	B	B	B	B	C	B	B	C	B	B
Approach Vol, veh/h		264			783			294			304	
Approach Delay, s/veh		17.5			16.6			15.4			18.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	11.6	10.1	11.6	6.5	15.4	5.9	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	30.5	23.5	22.5	25.5	11.5	42.5	9.5	38.5
Max Q Clear Time (g_c+I1), s	6.2	6.3	5.1	4.0	3.0	3.1	2.6	7.9
Green Ext Time (p_c), s	0.5	0.9	0.8	1.2	0.0	0.7	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	16.8
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	364	165	234	341	0	0	0	0	422	137	413
Future Volume (veh/h)	0	364	165	234	341	0	0	0	0	422	137	413
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	396	179	254	371	0				304	366	384
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	759	338	428	1547	0				644	676	573
Arrive On Green	0.00	0.22	0.22	0.12	0.44	0.00				0.36	0.36	0.36
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	396	179	254	371	0				304	366	384
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	4.5	4.6	3.2	3.0	0.0				6.0	7.1	9.4
Cycle Q Clear(g_c), s	0.0	4.5	4.6	3.2	3.0	0.0				6.0	7.1	9.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	759	338	428	1547	0				644	676	573
V/C Ratio(X)	0.00	0.52	0.53	0.59	0.24	0.00				0.47	0.54	0.67
Avail Cap(c_a), veh/h	0	2200	981	1539	4130	0				2225	2336	1980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	15.8	15.9	18.9	8.0	0.0				11.1	11.5	12.2
Incr Delay (d2), s/veh	0.0	0.6	1.3	1.3	0.1	0.0				0.5	0.7	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	1.5	1.2	0.9	0.0				2.0	2.5	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	16.4	17.2	20.2	8.1	0.0				11.7	12.2	13.6
LnGrp LOS	A	B	B	C	A	A				B	B	B
Approach Vol, veh/h		575			625						1054	
Approach Delay, s/veh		16.6			13.0						12.5	
Approach LOS		B			B						B	

Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.2	14.3		21.1		24.5				
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s			20.5	28.5		57.5		53.5				
Max Q Clear Time (g_c+I1), s			5.2	6.6		11.4		5.0				
Green Ext Time (p_c), s			0.7	3.2		5.3		2.7				

Intersection Summary			
HCM 6th Ctrl Delay			13.7
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	329	442	267	436	77	146	84	199	73	86	17
Future Volume (veh/h)	8	329	442	267	436	77	146	84	199	73	86	17
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	9	358	480	290	474	84	159	91	216	79	93	18
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	21	1619	690	443	1310	231	211	315	470	111	171	33
Arrive On Green	0.01	0.32	0.32	0.13	0.44	0.44	0.12	0.17	0.17	0.06	0.11	0.11
Sat Flow, veh/h	1767	5066	1572	3428	2995	528	1767	1856	1572	1767	1511	292
Grp Volume(v), veh/h	9	358	480	290	278	280	159	91	216	79	0	111
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1761	1767	1856	1572	1767	0	1803
Q Serve(g_s), s	0.3	2.9	13.9	4.5	6.0	6.0	4.9	2.4	6.3	2.5	0.0	3.3
Cycle Q Clear(g_c), s	0.3	2.9	13.9	4.5	6.0	6.0	4.9	2.4	6.3	2.5	0.0	3.3
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	21	1619	690	443	771	770	211	315	470	111	0	204
V/C Ratio(X)	0.44	0.22	0.70	0.65	0.36	0.36	0.75	0.29	0.46	0.71	0.00	0.54
Avail Cap(c_a), veh/h	203	1927	786	1244	1107	1106	1079	1461	1442	485	0	813
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	0.00	1.00
Uniform Delay (d), s/veh	27.7	14.1	12.8	23.4	10.6	10.6	24.1	20.5	16.1	26.0	0.0	23.7
Incr Delay (d2), s/veh	13.9	0.1	2.3	1.6	0.3	0.3	5.4	0.5	0.7	8.1	0.0	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	0.2	1.0	4.5	1.8	2.0	2.0	2.2	1.0	2.1	1.2	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.6	14.1	15.1	25.0	10.9	10.9	29.4	21.0	16.8	34.1	0.0	25.9
LnGrp LOS	D	B	B	C	B	B	C	C	B	C	A	C
Approach Vol, veh/h		847			848			466			190	
Approach Delay, s/veh		15.0			15.7			21.9			29.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	14.1	11.8	22.6	11.2	10.9	5.2	29.2
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	15.5	44.5	20.5	21.5	34.5	25.5	6.5	35.5
Max Q Clear Time (g_c+I1), s	4.5	8.3	6.5	15.9	6.9	5.3	2.3	8.0
Green Ext Time (p_c), s	0.1	1.3	0.8	2.1	0.4	0.5	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	2	46	0	0	0	87	192	3	10	455	324
Future Volume (veh/h)	246	2	46	0	0	0	87	192	3	10	455	324
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	268	0	50	0	0	0	95	209	3	11	495	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	562	0	250	0	6	0	161	1344	19	26	1062	
Arrive On Green	0.16	0.00	0.16	0.00	0.00	0.00	0.09	0.38	0.38	0.01	0.30	0.00
Sat Flow, veh/h	3534	0	1572	0	1856	0	1767	3558	51	1767	3526	1572
Grp Volume(v), veh/h	268	0	50	0	0	0	95	103	109	11	495	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	1856	0	1767	1763	1846	1767	1763	1572
Q Serve(g_s), s	2.1	0.0	0.8	0.0	0.0	0.0	1.6	1.2	1.2	0.2	3.4	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.8	0.0	0.0	0.0	1.6	1.2	1.2	0.2	3.4	0.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	562	0	250	0	6	0	161	666	697	26	1062	
V/C Ratio(X)	0.48	0.00	0.20	0.00	0.00	0.00	0.59	0.16	0.16	0.43	0.47	
Avail Cap(c_a), veh/h	3113	0	1385	0	1110	0	1145	2930	3069	441	4453	
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.5	0.0	11.0	0.0	0.0	0.0	13.1	6.2	6.2	14.7	8.5	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.4	0.0	0.0	0.0	3.4	0.1	0.1	10.8	0.3	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.2	0.0	0.0	0.0	0.6	0.3	0.3	0.1	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	11.4	0.0	0.0	0.0	16.6	6.3	6.3	25.5	8.9	0.0
LnGrp LOS	B	A	B	A	A	A	B	A	A	C	A	
Approach Vol, veh/h		318			0			307			506	A
Approach Delay, s/veh		12.0			0.0			9.5			9.2	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.9	15.9		9.3	7.2	13.6		0.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.5	50.0		26.5	19.5	38.0		18.0
Max Q Clear Time (g_c+I1), s	2.2	3.2		4.1	3.6	5.4		0.0
Green Ext Time (p_c), s	0.0	1.3		1.1	0.2	3.6		0.0

Intersection Summary			
HCM 6th Ctrl Delay			10.1
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	60	97	7	0	48
Future Vol, veh/h	0	60	97	7	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	65	105	8	0	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	105
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	947
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	947
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	947
HCM Lane V/C Ratio	-	-	-	0.055
HCM Control Delay (s)	-	-	-	9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	62	7	9	77	22	3	0	4	14	1	10
Future Volume (veh/h)	15	62	7	9	77	22	3	0	4	14	1	10
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	16	67	8	10	84	24	3	0	4	15	1	11
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	37	263	31	24	286	242	7	0	9	57	4	54
Arrive On Green	0.02	0.16	0.16	0.01	0.15	0.15	0.01	0.00	0.01	0.03	0.03	0.03
Sat Flow, veh/h	1767	1626	194	1767	1856	1572	707	0	943	1662	111	1572
Grp Volume(v), veh/h	16	0	75	10	84	24	7	0	0	16	0	11
Grp Sat Flow(s),veh/h/ln	1767	0	1821	1767	1856	1572	1650	0	0	1772	0	1572
Q Serve(g_s), s	0.2	0.0	0.8	0.1	0.9	0.3	0.1	0.0	0.0	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.2	0.0	0.8	0.1	0.9	0.3	0.1	0.0	0.0	0.2	0.0	0.2
Prop In Lane	1.00		0.11	1.00		1.00	0.43		0.57	0.94		1.00
Lane Grp Cap(c), veh/h	37	0	294	24	286	242	16	0	0	61	0	54
V/C Ratio(X)	0.43	0.00	0.25	0.42	0.29	0.10	0.45	0.00	0.00	0.26	0.00	0.20
Avail Cap(c_a), veh/h	1342	0	3199	1035	2939	2490	1683	0	0	1884	0	1672
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.1	0.0	8.4	11.3	8.6	8.4	11.4	0.0	0.0	10.8	0.0	10.8
Incr Delay (d2), s/veh	7.6	0.0	0.5	11.4	0.6	0.2	18.6	0.0	0.0	2.2	0.0	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	0.1	0.0	0.2	0.1	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	0.0	8.9	22.7	9.2	8.6	29.9	0.0	0.0	13.1	0.0	12.6
LnGrp LOS	B	A	A	C	A	A	C	A	A	B	A	B
Approach Vol, veh/h		91			118			7			27	
Approach Delay, s/veh		10.6			10.2			29.9			12.9	
Approach LOS		B			B			C			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		4.7	4.8	8.2		5.3	5.0	8.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		23.5	13.5	40.5		24.5	17.5	36.5				
Max Q Clear Time (g_c+I1), s		2.1	2.1	2.8		2.2	2.2	2.9				
Green Ext Time (p_c), s		0.0	0.0	0.4		0.1	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			11.2									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	84	9	13	152	161	113
Future Volume (veh/h)	84	9	13	152	161	113
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	91	10	14	165	175	123
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	186	166	33	1671	497	330
Arrive On Green	0.11	0.11	0.02	0.47	0.25	0.25
Sat Flow, veh/h	1767	1572	1767	3618	2121	1348
Grp Volume(v), veh/h	91	10	14	165	151	147
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1613
Q Serve(g_s), s	1.0	0.1	0.2	0.6	1.5	1.6
Cycle Q Clear(g_c), s	1.0	0.1	0.2	0.6	1.5	1.6
Prop In Lane	1.00	1.00	1.00			0.84
Lane Grp Cap(c), veh/h	186	166	33	1671	432	395
V/C Ratio(X)	0.49	0.06	0.42	0.10	0.35	0.37
Avail Cap(c_a), veh/h	3344	2976	1280	11614	4160	3806
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	8.6	10.4	3.1	6.7	6.7
Incr Delay (d2), s/veh	2.0	0.2	8.4	0.0	0.5	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	0.3	0.0	0.1	0.0	0.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.0	8.8	18.8	3.1	7.2	7.3
LnGrp LOS	B	A	B	A	A	A
Approach Vol, veh/h	101			179	298	
Approach Delay, s/veh	10.8			4.4	7.2	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		14.6		6.8	4.9	9.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		70.5		40.5	15.5	50.5
Max Q Clear Time (g_c+I1), s		2.6		3.0	2.2	3.6
Green Ext Time (p_c), s		1.2		0.3	0.0	2.0

Intersection Summary						
HCM 6th Ctrl Delay			7.0			
HCM 6th LOS			A			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	425	35	235	392	273	46	67	169	243	77	55
Future Volume (veh/h)	54	425	35	235	392	273	46	67	169	243	77	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	59	462	38	255	426	297	50	73	184	264	84	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	101	1026	319	431	955	630	90	555	445	444	438	371
Arrive On Green	0.06	0.20	0.20	0.13	0.27	0.27	0.05	0.16	0.16	0.13	0.24	0.24
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	59	462	38	255	426	297	50	73	184	264	84	60
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	1.5	3.7	0.9	3.3	4.7	6.5	1.3	0.8	4.4	3.4	1.7	1.4
Cycle Q Clear(g_c), s	1.5	3.7	0.9	3.3	4.7	6.5	1.3	0.8	4.4	3.4	1.7	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	1026	319	431	955	630	90	555	445	444	438	371
V/C Ratio(X)	0.58	0.45	0.12	0.59	0.45	0.47	0.55	0.13	0.41	0.60	0.19	0.16
Avail Cap(c_a), veh/h	586	2979	925	1796	2752	1431	548	1847	1021	1869	1409	1194
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	21.5	16.4	15.2	19.3	14.1	10.4	21.7	16.9	13.6	19.2	14.3	14.2
Incr Delay (d2), s/veh	5.2	0.3	0.2	1.3	0.3	0.6	5.2	0.1	0.6	1.3	0.2	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	0.7	1.3	0.3	1.2	1.6	1.9	0.6	0.3	1.4	1.3	0.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	16.7	15.4	20.6	14.5	10.9	26.9	17.1	14.2	20.5	14.5	14.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		559			978			307			408	
Approach Delay, s/veh		17.6			15.0			17.0			18.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	11.9	10.4	14.0	6.9	15.5	7.2	17.2
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	25.5	24.5	24.5	27.5	14.5	35.5	15.5	36.5
Max Q Clear Time (g_c+I1), s	5.4	6.4	5.3	5.7	3.3	3.7	3.5	8.5
Green Ext Time (p_c), s	0.9	0.9	0.8	3.3	0.1	0.6	0.1	4.1

Intersection Summary	
HCM 6th Ctrl Delay	16.5
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1	3	56	7	168	9	464	75	162	503	3
Future Volume (veh/h)	9	1	3	56	7	168	9	464	75	162	503	3
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	10	1	3	61	8	183	10	504	82	176	547	3
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	250	35	42	353	38	257	23	652	106	234	993	5
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.01	0.42	0.42	0.13	0.54	0.54
Sat Flow, veh/h	729	217	258	1283	231	1572	1767	1557	253	1767	1844	10
Grp Volume(v), veh/h	14	0	0	69	0	183	10	0	586	176	0	550
Grp Sat Flow(s),veh/h/ln	1204	0	0	1514	0	1572	1767	0	1810	1767	0	1854
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	5.2	0.3	0.0	13.2	4.5	0.0	9.2
Cycle Q Clear(g_c), s	1.6	0.0	0.0	1.6	0.0	5.2	0.3	0.0	13.2	4.5	0.0	9.2
Prop In Lane	0.71		0.21	0.88		1.00	1.00		0.14	1.00		0.01
Lane Grp Cap(c), veh/h	327	0	0	391	0	257	23	0	758	234	0	998
V/C Ratio(X)	0.04	0.00	0.00	0.18	0.00	0.71	0.43	0.00	0.77	0.75	0.00	0.55
Avail Cap(c_a), veh/h	673	0	0	779	0	680	205	0	2387	876	0	3149
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	0.0	17.2	0.0	18.8	23.2	0.0	11.8	19.8	0.0	7.2
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	3.6	12.4	0.0	1.7	4.8	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	0.1	0.0	0.0	0.6	0.0	1.9	0.2	0.0	4.5	2.0	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	0.0	0.0	17.4	0.0	22.4	35.6	0.0	13.5	24.6	0.0	7.7
LnGrp LOS	B	A	A	B	A	C	D	A	B	C	A	A
Approach Vol, veh/h		14			252			596			726	
Approach Delay, s/veh		16.8			21.0			13.9			11.8	
Approach LOS		B			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.8	24.4		12.3	5.1	30.0		12.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	23.5	62.5		20.5	5.5	80.5		20.5				
Max Q Clear Time (g_c+I1), s	6.5	15.2		3.6	2.3	11.2		7.2				
Green Ext Time (p_c), s	0.4	4.7		0.0	0.0	4.2		0.8				

Intersection Summary		
HCM 6th Ctrl Delay		14.1
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	271	1	10	242	5	6	1	16	4	0	1
Future Vol, veh/h	0	271	1	10	242	5	6	1	16	4	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	295	1	11	263	5	7	1	17	4	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	268	0	0	296	0	0	584	586	296	593	584	266
Stage 1	-	-	-	-	-	-	296	296	-	288	288	-
Stage 2	-	-	-	-	-	-	288	290	-	305	296	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1290	-	-	1260	-	-	422	421	741	416	422	770
Stage 1	-	-	-	-	-	-	710	666	-	717	672	-
Stage 2	-	-	-	-	-	-	717	670	-	702	666	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1290	-	-	1260	-	-	419	417	741	403	418	770
Mov Cap-2 Maneuver	-	-	-	-	-	-	419	417	-	403	418	-
Stage 1	-	-	-	-	-	-	710	666	-	717	666	-
Stage 2	-	-	-	-	-	-	710	664	-	684	666	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	11.3	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	600	1290	-	-	1260	-	-	445
HCM Lane V/C Ratio	0.042	-	-	-	0.009	-	-	0.012
HCM Control Delay (s)	11.3	0	-	-	7.9	-	-	13.2
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	191	81	311	175	1	80	5	250	4	4	2
Future Volume (veh/h)	3	191	81	311	175	1	80	5	250	4	4	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	3	208	88	338	190	1	87	5	272	4	4	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	7	428	175	446	781	4	459	21	714	213	175	62
Arrive On Green	0.00	0.18	0.18	0.25	0.42	0.42	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1767	2441	998	1767	1844	10	1322	105	1572	370	864	308
Grp Volume(v), veh/h	3	148	148	338	0	191	92	0	272	10	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1676	1767	0	1854	1427	0	1572	1542	0	0
Q Serve(g_s), s	0.1	2.8	2.9	6.4	0.0	2.4	1.8	0.0	4.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	2.8	2.9	6.4	0.0	2.4	2.0	0.0	4.2	0.2	0.0	0.0
Prop In Lane	1.00		0.60	1.00		0.01	0.95		1.00	0.40		0.20
Lane Grp Cap(c), veh/h	7	309	294	446	0	785	480	0	714	450	0	0
V/C Ratio(X)	0.41	0.48	0.50	0.76	0.00	0.24	0.19	0.00	0.38	0.02	0.00	0.00
Avail Cap(c_a), veh/h	315	1040	989	1916	0	2773	1186	0	1497	1152	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.1	13.5	13.6	12.6	0.0	6.8	12.4	0.0	6.6	11.7	0.0	0.0
Incr Delay (d2), s/veh	33.6	1.2	1.3	2.7	0.0	0.2	0.2	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	0.1	1.0	1.0	2.3	0.0	0.7	0.5	0.0	0.9	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	14.7	14.9	15.3	0.0	6.9	12.6	0.0	6.9	11.7	0.0	0.0
LnGrp LOS	D	B	B	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		299			529			364			10	
Approach Delay, s/veh		15.2			12.3			8.3			11.7	
Approach LOS		B			B			A			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.9	13.7	10.9		11.9	4.6	19.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		25.5	39.5	21.5		25.5	6.5	54.5				
Max Q Clear Time (g_c+I1), s		6.2	8.4	4.9		2.2	2.1	4.4				
Green Ext Time (p_c), s		1.4	1.1	1.5		0.0	0.0	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			11.8									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	351	136	420	389	187	80	144	426	149	129	42
Future Volume (veh/h)	40	351	136	420	389	187	80	144	426	149	129	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	43	382	148	457	423	203	87	157	463	162	140	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	72	592	264	615	711	338	113	963	712	208	1152	514
Arrive On Green	0.04	0.17	0.17	0.18	0.31	0.31	0.06	0.27	0.27	0.12	0.33	0.33
Sat Flow, veh/h	1767	3526	1572	3428	2319	1101	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	43	382	148	457	321	305	87	157	463	162	140	46
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1657	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	1.6	7.0	5.9	8.7	10.6	10.8	3.3	2.3	15.7	6.1	1.9	1.4
Cycle Q Clear(g_c), s	1.6	7.0	5.9	8.7	10.6	10.8	3.3	2.3	15.7	6.1	1.9	1.4
Prop In Lane	1.00		1.00	1.00		0.66	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	72	592	264	615	541	508	113	963	712	208	1152	514
V/C Ratio(X)	0.60	0.64	0.56	0.74	0.59	0.60	0.77	0.16	0.65	0.78	0.12	0.09
Avail Cap(c_a), veh/h	218	1205	537	1720	1269	1193	373	1102	774	578	1513	675
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	32.4	26.7	26.3	26.7	20.2	20.3	31.7	19.0	14.6	29.5	16.2	16.1
Incr Delay (d2), s/veh	7.7	1.2	1.9	1.8	1.0	1.1	10.3	0.1	1.7	6.2	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	2.9	2.3	3.5	4.2	4.0	1.7	0.9	5.3	2.8	0.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.1	27.9	28.1	28.5	21.2	21.4	42.0	19.1	16.3	35.7	16.3	16.1
LnGrp LOS	D	C	C	C	C	C	D	B	B	D	B	B
Approach Vol, veh/h		573			1083			707			348	
Approach Delay, s/veh		28.9			24.4			20.1			25.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	23.3	16.8	16.1	8.9	27.0	7.3	25.6
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	22.5	21.5	34.5	23.5	14.5	29.5	8.5	49.5
Max Q Clear Time (g_c+I1), s	8.1	17.7	10.7	9.0	5.3	3.9	3.6	12.8
Green Ext Time (p_c), s	0.4	1.1	1.7	2.6	0.1	1.0	0.0	4.5

Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	686	228	144	501	0	0	0	0	455	168	543
Future Volume (veh/h)	0	686	228	144	501	0	0	0	0	455	168	543
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	746	248	157	545	0				339	401	525
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1089	486	251	1581	0				740	777	658
Arrive On Green	0.00	0.31	0.31	0.07	0.45	0.00				0.42	0.42	0.42
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	746	248	157	545	0				339	401	525
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	12.6	8.8	3.0	6.8	0.0				9.3	10.8	19.7
Cycle Q Clear(g_c), s	0.0	12.6	8.8	3.0	6.8	0.0				9.3	10.8	19.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1089	486	251	1581	0				740	777	658
V/C Ratio(X)	0.00	0.69	0.51	0.63	0.34	0.00				0.46	0.52	0.80
Avail Cap(c_a), veh/h	0	1902	848	537	2688	0				1551	1629	1380
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	20.5	19.2	30.5	12.2	0.0				14.2	14.6	17.2
Incr Delay (d2), s/veh	0.0	0.8	0.8	2.6	0.1	0.0				0.4	0.5	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
%ile BackOfQ(50%),veh/ln	0.0	4.9	3.1	1.3	2.4	0.0				3.5	4.2	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	21.3	20.0	33.0	12.3	0.0				14.6	15.1	19.4
LnGrp LOS	A	C	C	C	B	A				B	B	B
Approach Vol, veh/h		994			702						1265	
Approach Delay, s/veh		21.0			16.9						16.8	
Approach LOS		C			B						B	

Timer - Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			9.4	25.4		32.8		34.8
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			10.6	36.5		59.4		51.6
Max Q Clear Time (g_c+I1), s			5.0	14.6		21.7		8.8
Green Ext Time (p_c), s			0.2	6.3		6.6		4.2

Intersection Summary		
HCM 6th Ctrl Delay		18.2
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	601	500	227	344	57	278	143	436	160	170	20
Future Volume (veh/h)	10	601	500	227	344	57	278	143	436	160	170	20
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	653	543	247	374	62	302	155	474	174	185	22
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	24	1310	718	348	1050	173	350	568	641	215	373	44
Arrive On Green	0.01	0.26	0.26	0.10	0.35	0.35	0.20	0.31	0.31	0.12	0.23	0.23
Sat Flow, veh/h	1767	5066	1572	3428	3031	498	1767	1856	1572	1767	1627	194
Grp Volume(v), veh/h	11	653	543	247	216	220	302	155	474	174	0	207
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1766	1767	1856	1572	1767	0	1821
Q Serve(g_s), s	0.5	9.3	21.9	5.9	7.7	7.9	14.0	5.4	21.7	8.1	0.0	8.4
Cycle Q Clear(g_c), s	0.5	9.3	21.9	5.9	7.7	7.9	14.0	5.4	21.7	8.1	0.0	8.4
Prop In Lane	1.00		1.00	1.00		0.28	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	24	1310	718	348	611	612	350	568	641	215	0	417
V/C Ratio(X)	0.46	0.50	0.76	0.71	0.35	0.36	0.86	0.27	0.74	0.81	0.00	0.50
Avail Cap(c_a), veh/h	104	1310	718	927	828	830	678	797	835	434	0	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.5	26.7	19.1	36.8	20.6	20.7	32.8	22.3	21.3	36.3	0.0	28.4
Incr Delay (d2), s/veh	13.3	0.3	4.6	2.7	0.3	0.4	6.3	0.3	2.5	7.2	0.0	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	0.3	3.7	9.1	2.6	3.1	3.2	6.4	2.3	7.9	3.9	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.8	27.0	23.7	39.5	21.0	21.0	39.1	22.5	23.8	43.4	0.0	29.3
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	A	C
Approach Vol, veh/h		1207			683			931			381	
Approach Delay, s/veh		25.8			27.7			28.5			35.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	30.4	13.1	26.4	21.3	23.9	5.6	33.9
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	20.8	36.4	22.9	21.9	32.5	24.7	5.0	39.8
Max Q Clear Time (g_c+I1), s	10.1	23.7	7.9	23.9	16.0	10.4	2.5	9.9
Green Ext Time (p_c), s	0.3	2.3	0.7	0.0	0.8	0.9	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	446	0	29	0	0	1	238	419	4	5	362	509
Future Volume (veh/h)	446	0	29	0	0	1	238	419	4	5	362	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	485	0	32	0	0	1	259	455	4	5	393	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	746	0	332	0	0	3	339	1366	12	12	692	
Arrive On Green	0.21	0.00	0.21	0.00	0.00	0.00	0.19	0.38	0.38	0.01	0.20	0.00
Sat Flow, veh/h	3534	0	1572	0	0	1572	1767	3581	31	1767	3526	1572
Grp Volume(v), veh/h	485	0	32	0	0	1	259	224	235	5	393	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	0	1573	1767	1763	1850	1767	1763	1572
Q Serve(g_s), s	5.7	0.0	0.7	0.0	0.0	0.0	6.3	4.1	4.1	0.1	4.5	0.0
Cycle Q Clear(g_c), s	5.7	0.0	0.7	0.0	0.0	0.0	6.3	4.1	4.1	0.1	4.5	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	746	0	332	0	0	3	339	672	705	12	692	
V/C Ratio(X)	0.65	0.00	0.10	0.00	0.00	0.29	0.76	0.33	0.33	0.42	0.57	
Avail Cap(c_a), veh/h	2392	0	1064	0	0	628	1196	1878	1970	216	1799	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.3	0.0	14.3	0.0	0.0	22.5	17.3	9.9	9.9	22.3	16.4	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.1	0.0	0.0	39.8	3.6	0.3	0.3	21.9	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	2.1	0.0	0.2	0.0	0.0	0.0	2.5	1.3	1.4	0.1	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.2	0.0	14.4	0.0	0.0	62.3	20.9	10.2	10.2	44.2	17.1	0.0
LnGrp LOS	B	A	B	A	A	E	C	B	B	D	B	
Approach Vol, veh/h		517			1			718			398	A
Approach Delay, s/veh		17.0			62.3			14.0			17.5	
Approach LOS		B			E			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	21.7		14.0	13.1	13.3		4.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	48.0		30.5	30.5	23.0		18.0				
Max Q Clear Time (g_c+I1), s	2.1	6.1		7.7	8.3	6.5		2.0				
Green Ext Time (p_c), s	0.0	3.0		1.9	0.7	2.3		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		15.8
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	140	49	7	0	43
Future Vol, veh/h	0	140	49	7	0	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	152	53	8	0	47

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	53
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	1012
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	1012
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1012
HCM Lane V/C Ratio	-	-	-	0.046
HCM Control Delay (s)	-	-	-	8.7
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	113	4	2	38	41	9	3	16	28	1	18
Future Volume (veh/h)	27	113	4	2	38	41	9	3	16	28	1	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	29	123	4	2	41	45	10	3	17	30	1	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	64	336	11	7	286	242	21	6	35	102	3	94
Arrive On Green	0.04	0.19	0.19	0.00	0.15	0.15	0.04	0.04	0.04	0.06	0.06	0.06
Sat Flow, veh/h	1767	1787	58	1767	1856	1572	553	166	940	1713	57	1572
Grp Volume(v), veh/h	29	0	127	2	41	45	30	0	0	31	0	20
Grp Sat Flow(s),veh/h/ln	1767	0	1845	1767	1856	1572	1659	0	0	1770	0	1572
Q Serve(g_s), s	0.4	0.0	1.5	0.0	0.5	0.6	0.4	0.0	0.0	0.4	0.0	0.3
Cycle Q Clear(g_c), s	0.4	0.0	1.5	0.0	0.5	0.6	0.4	0.0	0.0	0.4	0.0	0.3
Prop In Lane	1.00		0.03	1.00		1.00	0.33		0.57	0.97		1.00
Lane Grp Cap(c), veh/h	64	0	347	7	286	242	62	0	0	105	0	94
V/C Ratio(X)	0.45	0.00	0.37	0.29	0.14	0.19	0.48	0.00	0.00	0.29	0.00	0.21
Avail Cap(c_a), veh/h	1224	0	2665	804	2240	1898	1936	0	0	1716	0	1525
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.9	0.0	9.0	12.6	9.2	9.3	11.9	0.0	0.0	11.4	0.0	11.3
Incr Delay (d2), s/veh	4.9	0.0	0.6	20.9	0.2	0.4	5.7	0.0	0.0	1.5	0.0	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	0.2	0.0	0.4	0.0	0.1	0.2	0.2	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	0.0	9.6	33.5	9.5	9.7	17.6	0.0	0.0	12.9	0.0	12.4
LnGrp LOS	B	A	A	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		156			88			30			51	
Approach Delay, s/veh		10.9			10.1			17.6			12.7	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		5.4	4.6	9.2		6.0	5.4	8.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		29.5	11.5	36.5		24.5	17.5	30.5				
Max Q Clear Time (g_c+I1), s		2.4	2.0	3.5		2.4	2.4	2.6				
Green Ext Time (p_c), s		0.1	0.0	0.7		0.2	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	164	30	32	403	377	114
Future Volume (veh/h)	164	30	32	403	377	114
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	178	33	35	438	410	124
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	269	239	75	1863	872	261
Arrive On Green	0.15	0.15	0.04	0.53	0.33	0.33
Sat Flow, veh/h	1767	1572	1767	3618	2767	800
Grp Volume(v), veh/h	178	33	35	438	269	265
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1711
Q Serve(g_s), s	2.7	0.5	0.5	1.9	3.4	3.5
Cycle Q Clear(g_c), s	2.7	0.5	0.5	1.9	3.4	3.5
Prop In Lane	1.00	1.00	1.00			0.47
Lane Grp Cap(c), veh/h	269	239	75	1863	575	558
V/C Ratio(X)	0.66	0.14	0.47	0.24	0.47	0.47
Avail Cap(c_a), veh/h	2540	2260	909	8820	3221	3128
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	10.3	13.2	3.6	7.5	7.6
Incr Delay (d2), s/veh	2.8	0.3	4.4	0.1	0.6	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	0.9	0.5	0.3	0.2	0.8	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.0	10.6	17.6	3.6	8.1	8.2
LnGrp LOS	B	B	B	A	A	A
Approach Vol, veh/h	211			473	534	
Approach Delay, s/veh	13.5			4.7	8.2	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		19.4		8.8	5.7	13.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		70.5		40.5	14.5	51.5
Max Q Clear Time (g_c+I1), s		3.9		4.7	2.5	5.5
Green Ext Time (p_c), s		3.3		0.6	0.0	3.7

Intersection Summary			
HCM 6th Ctrl Delay			7.7
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	640	103	317	696	490	72	151	355	522	192	117
Future Volume (veh/h)	55	640	103	317	696	490	72	151	355	522	192	117
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	60	696	112	345	757	533	78	164	386	567	209	127
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	77	1253	389	446	1176	839	101	811	566	685	691	586
Arrive On Green	0.04	0.25	0.25	0.13	0.33	0.33	0.06	0.23	0.23	0.20	0.37	0.37
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	60	696	112	345	757	533	78	164	386	567	209	127
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	3.1	11.2	5.4	9.1	17.0	22.3	4.1	3.5	19.4	14.8	7.4	5.1
Cycle Q Clear(g_c), s	3.1	11.2	5.4	9.1	17.0	22.3	4.1	3.5	19.4	14.8	7.4	5.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	77	1253	389	446	1176	839	101	811	566	685	691	586
V/C Ratio(X)	0.78	0.56	0.29	0.77	0.64	0.64	0.77	0.20	0.68	0.83	0.30	0.22
Avail Cap(c_a), veh/h	184	1330	413	937	1523	993	237	812	567	1121	786	666
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	30.6	28.4	39.3	26.4	15.4	43.4	29.0	25.3	35.8	20.7	20.0
Incr Delay (d2), s/veh	15.2	0.5	0.4	2.9	0.6	1.0	11.8	0.1	3.3	2.7	0.2	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	1.7	4.5	2.0	4.0	7.0	7.6	2.1	1.5	7.5	6.3	3.2	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	31.1	28.9	42.2	27.0	16.4	55.2	29.1	28.7	38.5	20.9	20.2
LnGrp LOS	E	C	C	D	C	B	E	C	C	D	C	C
Approach Vol, veh/h		868			1635			628			903	
Approach Delay, s/veh		32.8			26.7			32.1			31.9	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.1	25.9	16.6	27.6	9.8	39.3	8.6	35.6				
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	30.5	21.5	25.5	24.5	12.5	39.5	9.7	40.3				
Max Q Clear Time (g_c+I1), s	16.8	21.4	11.1	13.2	6.1	9.4	5.1	24.3				
Green Ext Time (p_c), s	1.8	0.0	1.0	4.0	0.1	1.7	0.0	6.8				
Intersection Summary												
HCM 6th Ctrl Delay			30.0									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	5	4	80	4	104	0	349	51	148	379	6
Future Volume (veh/h)	6	5	4	80	4	104	0	349	51	148	379	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	7	5	4	87	4	113	0	379	55	161	412	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	201	106	52	387	12	204	5	559	81	219	1106	19
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.00	0.35	0.35	0.12	0.61	0.61
Sat Flow, veh/h	386	817	401	1401	90	1572	1767	1584	230	1767	1819	31
Grp Volume(v), veh/h	16	0	0	91	0	113	0	0	434	161	0	419
Grp Sat Flow(s),veh/h/ln	1603	0	0	1490	0	1572	1767	0	1814	1767	0	1850
Q Serve(g_s), s	0.0	0.0	0.0	0.8	0.0	2.3	0.0	0.0	7.0	3.0	0.0	3.9
Cycle Q Clear(g_c), s	0.3	0.0	0.0	1.8	0.0	2.3	0.0	0.0	7.0	3.0	0.0	3.9
Prop In Lane	0.44		0.25	0.96		1.00	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	359	0	0	399	0	204	5	0	640	219	0	1125
V/C Ratio(X)	0.04	0.00	0.00	0.23	0.00	0.55	0.00	0.00	0.68	0.73	0.00	0.37
Avail Cap(c_a), veh/h	1183	0	0	1181	0	1076	257	0	2986	1364	0	4204
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.1	0.0	0.0	13.7	0.0	14.0	0.0	0.0	9.4	14.5	0.0	3.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	2.3	0.0	0.0	1.3	4.7	0.0	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	0.1	0.0	0.0	0.6	0.0	0.8	0.0	0.0	2.1	1.3	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	0.0	0.0	14.0	0.0	16.3	0.0	0.0	10.7	19.2	0.0	3.6
LnGrp LOS	B	A	A	B	A	B	A	A	B	B	A	A
Approach Vol, veh/h		16			204			434			580	
Approach Delay, s/veh		13.2			15.3			10.7			7.9	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	16.6		9.0	0.0	25.4		9.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	56.5		23.5	5.0	78.0		23.5				
Max Q Clear Time (g_c+I1), s	5.0	9.0		2.3	0.0	5.9		4.3				
Green Ext Time (p_c), s	0.4	3.1		0.0	0.0	3.0		0.8				
Intersection Summary												
HCM 6th Ctrl Delay			10.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	204	5	28	190	5	1	0	10	2	0	0
Future Vol, veh/h	1	204	5	28	190	5	1	0	10	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	222	5	30	207	5	1	0	11	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	212	0	0	227	0	0	497	499	225	502	499	210
Stage 1	-	-	-	-	-	-	227	227	-	270	270	-
Stage 2	-	-	-	-	-	-	270	272	-	232	229	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1352	-	-	1335	-	-	482	472	812	478	472	828
Stage 1	-	-	-	-	-	-	773	714	-	734	684	-
Stage 2	-	-	-	-	-	-	734	683	-	769	713	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1352	-	-	1335	-	-	473	461	812	463	461	828
Mov Cap-2 Maneuver	-	-	-	-	-	-	473	461	-	463	461	-
Stage 1	-	-	-	-	-	-	772	713	-	733	669	-
Stage 2	-	-	-	-	-	-	718	668	-	758	712	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1	9.8	12.8
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	762	1352	-	-	1335	-	-	463
HCM Lane V/C Ratio	0.016	0.001	-	-	0.023	-	-	0.005
HCM Control Delay (s)	9.8	7.7	0	-	7.8	-	-	12.8
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0.1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	151	64	259	187	1	34	3	159	2	3	1
Future Volume (veh/h)	1	151	64	259	187	1	34	3	159	2	3	1
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	1	164	70	282	203	1	37	3	173	2	3	1
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	6	412	169	391	717	4	421	25	573	206	157	39
Arrive On Green	0.00	0.17	0.17	0.22	0.39	0.39	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1767	2439	999	1767	1845	9	1269	175	1572	278	1100	276
Grp Volume(v), veh/h	1	117	117	282	0	204	40	0	173	6	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1676	1767	0	1854	1444	0	1572	1654	0	0
Q Serve(g_s), s	0.0	1.7	1.8	4.3	0.0	2.2	0.5	0.0	2.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.7	1.8	4.3	0.0	2.2	0.7	0.0	2.3	0.1	0.0	0.0
Prop In Lane	1.00		0.60	1.00		0.00	0.92		1.00	0.33		0.17
Lane Grp Cap(c), veh/h	6	297	283	391	0	720	446	0	573	403	0	0
V/C Ratio(X)	0.16	0.39	0.42	0.72	0.00	0.28	0.09	0.00	0.30	0.01	0.00	0.00
Avail Cap(c_a), veh/h	458	1372	1304	2414	0	3495	1452	0	1680	1480	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.4	10.7	10.7	10.4	0.0	6.1	10.9	0.0	6.6	10.6	0.0	0.0
Incr Delay (d2), s/veh	12.1	0.8	1.0	2.5	0.0	0.2	0.1	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	0.0	0.5	0.6	1.4	0.0	0.5	0.2	0.0	0.5	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.5	11.5	11.7	13.0	0.0	6.3	11.0	0.0	6.9	10.7	0.0	0.0
LnGrp LOS	C	B	B	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		235			486			213			6	
Approach Delay, s/veh		11.7			10.2			7.6			10.7	
Approach LOS		B			B			A			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		8.6	10.9	9.4		8.6	4.5	15.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		24.5	39.5	22.5		24.5	7.5	54.5				
Max Q Clear Time (g_c+I1), s		4.3	6.3	3.8		2.1	2.0	4.2				
Green Ext Time (p_c), s		0.7	0.9	1.2		0.0	0.0	1.3				

Intersection Summary			
HCM 6th Ctrl Delay			10.0
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	252	51	246	449	135	39	57	183	161	72	49
Future Volume (veh/h)	26	252	51	246	449	135	39	57	183	161	72	49
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	274	55	267	488	147	42	62	199	175	78	53
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	57	697	311	441	786	235	79	574	458	234	883	394
Arrive On Green	0.03	0.20	0.20	0.13	0.29	0.29	0.04	0.16	0.16	0.13	0.25	0.25
Sat Flow, veh/h	1767	3526	1572	3428	2674	800	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	28	274	55	267	321	314	42	62	199	175	78	53
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1711	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	0.7	3.2	1.4	3.5	7.5	7.6	1.1	0.7	4.9	4.5	0.8	1.2
Cycle Q Clear(g_c), s	0.7	3.2	1.4	3.5	7.5	7.6	1.1	0.7	4.9	4.5	0.8	1.2
Prop In Lane	1.00		1.00	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	57	697	311	441	518	503	79	574	458	234	883	394
V/C Ratio(X)	0.49	0.39	0.18	0.61	0.62	0.63	0.53	0.11	0.43	0.75	0.09	0.13
Avail Cap(c_a), veh/h	353	2187	975	1550	1538	1493	390	1668	946	1059	3002	1339
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	22.6	16.6	15.9	19.6	14.5	14.5	22.2	17.0	13.7	19.9	13.7	13.8
Incr Delay (d2), s/veh	6.3	0.4	0.3	1.3	1.2	1.3	5.4	0.1	0.6	4.7	0.0	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	1.2	0.5	1.3	2.7	2.7	0.5	0.3	1.6	2.0	0.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	17.0	16.1	20.9	15.7	15.8	27.7	17.1	14.3	24.6	13.7	14.0
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		357			902			303			306	
Approach Delay, s/veh		17.8			17.3			16.7			20.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	12.2	10.6	13.9	6.6	16.4	6.0	18.5
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	28.5	22.5	21.5	29.5	10.5	40.5	9.5	41.5
Max Q Clear Time (g_c+I1), s	6.5	6.9	5.5	5.2	3.1	3.2	2.7	9.6
Green Ext Time (p_c), s	0.5	0.9	0.8	1.9	0.0	0.7	0.0	4.4

Intersection Summary	
HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	423	198	234	401	0	0	0	0	422	137	463
Future Volume (veh/h)	0	423	198	234	401	0	0	0	0	422	137	463
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	460	215	254	436	0				304	366	438
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	823	367	410	1553	0				680	714	605
Arrive On Green	0.00	0.23	0.23	0.12	0.44	0.00				0.38	0.38	0.38
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	460	215	254	436	0				304	366	438
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	5.9	6.2	3.6	4.1	0.0				6.6	7.8	12.2
Cycle Q Clear(g_c), s	0.0	5.9	6.2	3.6	4.1	0.0				6.6	7.8	12.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	823	367	410	1553	0				680	714	605
V/C Ratio(X)	0.00	0.56	0.59	0.62	0.28	0.00				0.45	0.51	0.72
Avail Cap(c_a), veh/h	0	1952	871	1232	3528	0				2043	2145	1818
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.4	17.5	21.5	9.2	0.0				11.8	12.1	13.5
Incr Delay (d2), s/veh	0.0	0.6	1.5	1.5	0.1	0.0				0.5	0.6	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
%ile BackOfQ(50%),veh/ln	0.0	2.2	2.2	1.4	1.3	0.0				2.3	2.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.0	19.0	23.1	9.3	0.0				12.2	12.7	15.2
LnGrp LOS	A	B	B	C	A	A				B	B	B
Approach Vol, veh/h		675			690						1108	
Approach Delay, s/veh		18.3			14.4						13.5	
Approach LOS		B			B						B	

Timer - Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			10.6	16.5		24.3		27.2
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			18.5	28.5		59.5		51.5
Max Q Clear Time (g_c+I1), s			5.6	8.2		14.2		6.1
Green Ext Time (p_c), s			0.7	3.8		5.6		3.3

Intersection Summary		
HCM 6th Ctrl Delay		15.1
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	342	488	267	452	77	190	84	199	73	86	17
Future Volume (veh/h)	8	342	488	267	452	77	190	84	199	73	86	17
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	9	372	530	290	491	84	207	91	216	79	93	18
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	21	1627	743	434	1314	224	267	353	498	108	151	29
Arrive On Green	0.01	0.32	0.32	0.13	0.44	0.44	0.15	0.19	0.19	0.06	0.10	0.10
Sat Flow, veh/h	1767	5066	1572	3428	3013	513	1767	1856	1572	1767	1511	292
Grp Volume(v), veh/h	9	372	530	290	286	289	207	91	216	79	0	111
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1763	1767	1856	1572	1767	0	1803
Q Serve(g_s), s	0.3	3.2	16.1	4.8	6.5	6.6	6.7	2.5	6.5	2.6	0.0	3.5
Cycle Q Clear(g_c), s	0.3	3.2	16.1	4.8	6.5	6.6	6.7	2.5	6.5	2.6	0.0	3.5
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	21	1627	743	434	769	769	267	353	498	108	0	181
V/C Ratio(X)	0.44	0.23	0.71	0.67	0.37	0.38	0.78	0.26	0.43	0.73	0.00	0.61
Avail Cap(c_a), veh/h	162	1736	776	1117	1016	1017	1137	1473	1447	428	0	708
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	0.00	1.00
Uniform Delay (d), s/veh	29.4	14.9	12.6	24.9	11.4	11.4	24.4	20.6	16.2	27.6	0.0	25.8
Incr Delay (d2), s/veh	14.0	0.1	3.0	1.8	0.3	0.3	4.8	0.4	0.6	9.1	0.0	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	0.2	1.1	5.3	1.9	2.3	2.3	3.0	1.0	2.2	1.3	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	14.9	15.5	26.7	11.7	11.7	29.2	21.0	16.8	36.7	0.0	29.2
LnGrp LOS	D	B	B	C	B	B	C	C	B	D	A	C
Approach Vol, veh/h		911			865			514			190	
Approach Delay, s/veh		15.6			16.7			22.5			32.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	15.9	12.1	23.7	13.5	10.5	5.2	30.6
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	14.5	47.5	19.5	20.5	38.5	23.5	5.5	34.5
Max Q Clear Time (g_c+I1), s	4.6	8.5	6.8	18.1	8.7	5.5	2.3	8.6
Green Ext Time (p_c), s	0.1	1.3	0.8	1.2	0.6	0.5	0.0	3.7

Intersection Summary		
HCM 6th Ctrl Delay		18.7
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	2	46	0	0	0	87	196	3	10	458	367
Future Volume (veh/h)	286	2	46	0	0	0	87	196	3	10	458	367
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	312	0	50	0	0	0	95	213	3	11	498	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	624	0	278	0	6	0	159	1326	19	26	1047	
Arrive On Green	0.18	0.00	0.18	0.00	0.00	0.00	0.09	0.37	0.37	0.01	0.30	0.00
Sat Flow, veh/h	3534	0	1572	0	1856	0	1767	3559	50	1767	3526	1572
Grp Volume(v), veh/h	312	0	50	0	0	0	95	105	111	11	498	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	1856	0	1767	1763	1847	1767	1763	1572
Q Serve(g_s), s	2.5	0.0	0.8	0.0	0.0	0.0	1.6	1.2	1.2	0.2	3.6	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.8	0.0	0.0	0.0	1.6	1.2	1.2	0.2	3.6	0.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	624	0	278	0	6	0	159	657	688	26	1047	
V/C Ratio(X)	0.50	0.00	0.18	0.00	0.00	0.00	0.60	0.16	0.16	0.43	0.48	
Avail Cap(c_a), veh/h	3254	0	1448	0	1079	0	1113	2734	2864	428	4100	
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.5	0.0	10.8	0.0	0.0	0.0	13.5	6.5	6.5	15.1	8.9	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.3	0.0	0.0	0.0	3.5	0.1	0.1	10.8	0.3	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.2	0.0	0.0	0.0	0.7	0.3	0.3	0.1	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	11.1	0.0	0.0	0.0	17.1	6.6	6.6	25.9	9.2	0.0
LnGrp LOS	B	A	B	A	A	A	B	A	A	C	A	
Approach Vol, veh/h		362			0			311			509	A
Approach Delay, s/veh		12.0			0.0			9.8			9.6	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	16.0		10.0	7.3	13.7		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	48.0		28.5	19.5	36.0		18.0				
Max Q Clear Time (g_c+I1), s	2.2	3.2		4.5	3.6	5.6		0.0				
Green Ext Time (p_c), s	0.0	1.3		1.3	0.2	3.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			10.4
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	79	97	16	0	71
Future Vol, veh/h	0	79	97	16	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	86	105	17	0	77

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	105
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	947
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	947
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	947
HCM Lane V/C Ratio	-	-	-	0.081
HCM Control Delay (s)	-	-	-	9.1
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	62	7	9	86	49	3	0	4	37	1	10
Future Volume (veh/h)	34	62	7	9	86	49	3	0	4	37	1	10
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	37	67	8	10	93	53	3	0	4	40	1	11
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	80	313	37	24	298	252	7	0	9	105	3	95
Arrive On Green	0.05	0.19	0.19	0.01	0.16	0.16	0.01	0.00	0.01	0.06	0.06	0.06
Sat Flow, veh/h	1767	1626	194	1767	1856	1572	707	0	943	1726	43	1572
Grp Volume(v), veh/h	37	0	75	10	93	53	7	0	0	41	0	11
Grp Sat Flow(s),veh/h/ln	1767	0	1821	1767	1856	1572	1650	0	0	1769	0	1572
Q Serve(g_s), s	0.5	0.0	0.9	0.1	1.1	0.7	0.1	0.0	0.0	0.6	0.0	0.2
Cycle Q Clear(g_c), s	0.5	0.0	0.9	0.1	1.1	0.7	0.1	0.0	0.0	0.6	0.0	0.2
Prop In Lane	1.00		0.11	1.00		1.00	0.43		0.57	0.98		1.00
Lane Grp Cap(c), veh/h	80	0	350	24	298	252	16	0	0	107	0	95
V/C Ratio(X)	0.46	0.00	0.21	0.42	0.31	0.21	0.45	0.00	0.00	0.38	0.00	0.12
Avail Cap(c_a), veh/h	1315	0	2966	889	2575	2183	1494	0	0	1886	0	1676
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	8.5	12.2	9.2	9.1	12.2	0.0	0.0	11.2	0.0	11.0
Incr Delay (d2), s/veh	4.1	0.0	0.3	11.5	0.6	0.4	18.7	0.0	0.0	2.2	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	0.2	0.0	0.2	0.1	0.3	0.2	0.1	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.7	0.0	8.8	23.6	9.8	9.5	30.9	0.0	0.0	13.4	0.0	11.6
LnGrp LOS	B	A	A	C	A	A	C	A	A	B	A	B
Approach Vol, veh/h		112			156			7			52	
Approach Delay, s/veh		11.0			10.6			30.9			13.1	
Approach LOS		B			B			C			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		4.7	4.8	9.3		6.0	5.6	8.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	12.5	40.5		26.5	18.5	34.5				
Max Q Clear Time (g_c+I1), s		2.1	2.1	2.9		2.6	2.5	3.1				
Green Ext Time (p_c), s		0.0	0.0	0.4		0.2	0.0	0.7				

Intersection Summary			
HCM 6th Ctrl Delay			11.6
HCM 6th LOS			B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	92	24	39	152	161	122
Future Volume (veh/h)	92	24	39	152	161	122
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	100	26	42	165	175	133
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	212	189	90	1724	475	341
Arrive On Green	0.12	0.12	0.05	0.49	0.24	0.24
Sat Flow, veh/h	1767	1572	1767	3618	2053	1405
Grp Volume(v), veh/h	100	26	42	165	156	152
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1603
Q Serve(g_s), s	1.2	0.3	0.5	0.6	1.7	1.8
Cycle Q Clear(g_c), s	1.2	0.3	0.5	0.6	1.7	1.8
Prop In Lane	1.00	1.00	1.00			0.88
Lane Grp Cap(c), veh/h	212	189	90	1724	427	389
V/C Ratio(X)	0.47	0.14	0.46	0.10	0.37	0.39
Avail Cap(c_a), veh/h	2955	2629	1650	11100	3560	3236
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	9.4	9.1	10.6	3.2	7.3	7.3
Incr Delay (d2), s/veh	1.6	0.3	3.7	0.0	0.5	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	0.4	0.0	0.2	0.0	0.4	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.1	9.4	14.3	3.2	7.8	7.9
LnGrp LOS	B	A	B	A	A	A
Approach Vol, veh/h	126			207	308	
Approach Delay, s/veh	10.7			5.4	7.9	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		15.8		7.3	5.7	10.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		72.5		38.5	21.5	46.5
Max Q Clear Time (g_c+I1), s		2.6		3.2	2.5	3.8
Green Ext Time (p_c), s		1.2		0.4	0.1	2.0

Intersection Summary			
HCM 6th Ctrl Delay			7.6
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	444	39	235	407	296	50	70	169	256	79	55
Future Volume (veh/h)	54	444	39	235	407	296	50	70	169	256	79	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	59	483	42	255	442	322	54	76	184	278	86	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	100	1082	336	425	991	652	94	551	441	458	439	372
Arrive On Green	0.06	0.21	0.21	0.12	0.28	0.28	0.05	0.16	0.16	0.13	0.24	0.24
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	59	483	42	255	442	322	54	76	184	278	86	60
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	1.6	4.0	1.0	3.4	5.0	7.3	1.4	0.9	4.6	3.7	1.8	1.5
Cycle Q Clear(g_c), s	1.6	4.0	1.0	3.4	5.0	7.3	1.4	0.9	4.6	3.7	1.8	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	1082	336	425	991	652	94	551	441	458	439	372
V/C Ratio(X)	0.59	0.45	0.13	0.60	0.45	0.49	0.57	0.14	0.42	0.61	0.20	0.16
Avail Cap(c_a), veh/h	567	2777	862	1666	2516	1332	530	1787	992	1950	1439	1220
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	22.3	16.5	15.4	20.0	14.3	10.4	22.3	17.6	14.2	19.7	14.8	14.6
Incr Delay (d2), s/veh	5.4	0.3	0.2	1.4	0.3	0.6	5.4	0.1	0.6	1.3	0.2	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	0.7	1.4	0.3	1.3	1.8	2.1	0.7	0.3	1.5	1.4	0.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	16.8	15.5	21.4	14.6	11.0	27.7	17.7	14.8	21.0	15.0	14.8
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		584			1019			314			424	
Approach Delay, s/veh		17.8			15.2			17.7			18.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	12.1	10.5	14.8	7.1	15.9	7.2	18.1
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	27.5	24.5	23.5	26.5	14.5	37.5	15.5	34.5
Max Q Clear Time (g_c+I1), s	5.7	6.6	5.4	6.0	3.4	3.8	3.6	9.3
Green Ext Time (p_c), s	0.9	1.0	0.8	3.4	0.1	0.7	0.1	4.3

Intersection Summary	
HCM 6th Ctrl Delay	16.9
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1	3	66	7	199	9	464	84	187	503	3
Future Volume (veh/h)	9	1	3	66	7	199	9	464	84	187	503	3
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	10	1	3	72	8	216	10	504	91	203	547	3
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	245	34	44	369	34	286	23	634	115	265	1017	6
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.41	0.41	0.15	0.55	0.55
Sat Flow, veh/h	707	187	244	1321	189	1572	1767	1530	276	1767	1844	10
Grp Volume(v), veh/h	14	0	0	80	0	216	10	0	595	203	0	550
Grp Sat Flow(s),veh/h/ln	1137	0	0	1510	0	1572	1767	0	1806	1767	0	1854
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	6.9	0.3	0.0	15.3	5.9	0.0	10.1
Cycle Q Clear(g_c), s	2.1	0.0	0.0	2.0	0.0	6.9	0.3	0.0	15.3	5.9	0.0	10.1
Prop In Lane	0.71		0.21	0.90		1.00	1.00		0.15	1.00		0.01
Lane Grp Cap(c), veh/h	323	0	0	403	0	286	23	0	749	265	0	1022
V/C Ratio(X)	0.04	0.00	0.00	0.20	0.00	0.76	0.44	0.00	0.79	0.77	0.00	0.54
Avail Cap(c_a), veh/h	555	0	0	669	0	576	183	0	2088	847	0	2840
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	0.0	18.6	0.0	20.6	26.1	0.0	13.6	21.7	0.0	7.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	4.1	12.7	0.0	2.0	4.6	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	0.1	0.0	0.0	0.8	0.0	0.3	0.2	0.0	5.5	2.6	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	0.0	0.0	18.9	0.0	24.7	38.7	0.0	15.6	26.4	0.0	8.0
LnGrp LOS	B	A	A	B	A	C	D	A	B	C	A	A
Approach Vol, veh/h		14			296			605			753	
Approach Delay, s/veh		18.0			23.1			15.9			13.0	
Approach LOS		B			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.5	26.6		14.2	5.2	33.8		14.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	25.5	61.5		19.5	5.5	81.5		19.5				
Max Q Clear Time (g_c+I1), s	7.9	17.3		4.1	2.3	12.1		8.9				
Green Ext Time (p_c), s	0.5	4.8		0.0	0.0	4.2		0.8				
Intersection Summary												
HCM 6th Ctrl Delay			15.9									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	302	4	23	280	5	9	1	32	4	0	1
Future Vol, veh/h	0	302	4	23	280	5	9	1	32	4	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	328	4	25	304	5	10	1	35	4	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	309	0	0	332	0	0	687	689	330	705	689	307
Stage 1	-	-	-	-	-	-	330	330	-	357	357	-
Stage 2	-	-	-	-	-	-	357	359	-	348	332	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1246	-	-	1222	-	-	360	367	709	350	367	731
Stage 1	-	-	-	-	-	-	681	644	-	659	627	-
Stage 2	-	-	-	-	-	-	659	625	-	666	643	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1246	-	-	1222	-	-	354	360	709	327	360	731
Mov Cap-2 Maneuver	-	-	-	-	-	-	354	360	-	327	360	-
Stage 1	-	-	-	-	-	-	681	644	-	659	614	-
Stage 2	-	-	-	-	-	-	645	613	-	632	643	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	11.8	14.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	573	1246	-	-	1222	-	-	368
HCM Lane V/C Ratio	0.08	-	-	-	0.02	-	-	0.015
HCM Control Delay (s)	11.8	0	-	-	8	-	-	14.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	207	112	460	188	1	118	8	431	4	7	2
Future Volume (veh/h)	3	207	112	460	188	1	118	8	431	4	7	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	3	225	122	500	204	1	128	9	468	4	8	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	7	366	191	587	906	4	462	28	919	154	265	55
Arrive On Green	0.00	0.16	0.16	0.33	0.49	0.49	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1767	2239	1169	1767	1845	9	1314	112	1572	268	1050	220
Grp Volume(v), veh/h	3	175	172	500	0	205	137	0	468	14	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1645	1767	0	1854	1426	0	1572	1538	0	0
Q Serve(g_s), s	0.1	4.9	5.2	14.1	0.0	3.4	3.9	0.0	9.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	4.9	5.2	14.1	0.0	3.4	4.2	0.0	9.4	0.3	0.0	0.0
Prop In Lane	1.00		0.71	1.00		0.00	0.93		1.00	0.29		0.14
Lane Grp Cap(c), veh/h	7	288	269	587	0	911	490	0	919	475	0	0
V/C Ratio(X)	0.42	0.61	0.64	0.85	0.00	0.23	0.28	0.00	0.51	0.03	0.00	0.00
Avail Cap(c_a), veh/h	181	609	568	1468	0	1990	754	0	1212	736	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.6	20.8	20.9	16.7	0.0	7.8	16.5	0.0	6.6	15.1	0.0	0.0
Incr Delay (d2), s/veh	34.1	2.1	2.5	3.6	0.0	0.1	0.3	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	0.1	2.0	2.0	5.5	0.0	1.1	1.3	0.0	2.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	22.9	23.4	20.3	0.0	7.9	16.8	0.0	7.0	15.1	0.0	0.0
LnGrp LOS	E	C	C	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		350			705			605			14	
Approach Delay, s/veh		23.5			16.7			9.2			15.1	
Approach LOS		C			B			A			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.0	22.3	13.3		18.0	4.7	30.8				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		23.5	44.5	18.5		23.5	5.5	57.5				
Max Q Clear Time (g_c+I1), s		11.4	16.1	7.2		2.3	2.1	5.4				
Green Ext Time (p_c), s		2.1	1.7	1.5		0.0	0.0	1.3				

Intersection Summary			
HCM 6th Ctrl Delay			15.4
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	544	136	435	548	187	80	144	443	149	129	45
Future Volume (veh/h)	44	544	136	435	548	187	80	144	443	149	129	45
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	48	591	148	473	596	203	87	157	482	162	140	49
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	72	810	361	607	945	321	113	898	679	203	1078	481
Arrive On Green	0.04	0.23	0.23	0.18	0.37	0.37	0.06	0.25	0.25	0.11	0.31	0.31
Sat Flow, veh/h	1767	3526	1572	3428	2582	878	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	48	591	148	473	406	393	87	157	482	162	140	49
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1698	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	2.2	12.5	6.4	10.6	15.3	15.3	3.9	2.8	20.2	7.2	2.3	1.8
Cycle Q Clear(g_c), s	2.2	12.5	6.4	10.6	15.3	15.3	3.9	2.8	20.2	7.2	2.3	1.8
Prop In Lane	1.00		1.00	1.00		0.52	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	72	810	361	607	645	621	113	898	679	203	1078	481
V/C Ratio(X)	0.66	0.73	0.41	0.78	0.63	0.63	0.77	0.17	0.71	0.80	0.13	0.10
Avail Cap(c_a), veh/h	209	1292	576	1342	1128	1086	296	898	679	450	1205	537
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	38.1	28.7	26.4	31.6	21.0	21.0	37.1	23.4	18.7	34.7	20.2	20.0
Incr Delay (d2), s/veh	10.0	1.3	0.7	2.2	1.0	1.1	10.5	0.1	3.4	7.0	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	1.1	5.2	2.4	4.4	6.1	6.0	2.0	1.1	7.5	3.4	0.9	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.0	30.0	27.1	33.8	22.1	22.1	47.6	23.5	22.2	41.7	20.3	20.1
LnGrp LOS	D	C	C	C	C	C	D	C	C	D	C	C
Approach Vol, veh/h		787			1272			726			351	
Approach Delay, s/veh		30.5			26.5			25.5			30.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	25.0	18.7	23.0	9.6	29.1	7.8	33.9
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	20.5	20.5	31.5	29.5	13.5	27.5	9.5	51.5
Max Q Clear Time (g_c+I1), s	9.2	22.2	12.6	14.5	5.9	4.3	4.2	17.3
Green Ext Time (p_c), s	0.3	0.0	1.6	4.0	0.1	1.0	0.0	6.0

Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	820	304	144	595	0	0	0	0	455	168	623
Future Volume (veh/h)	0	820	304	144	595	0	0	0	0	455	168	623
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	891	330	157	647	0				339	401	612
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1155	515	231	1573	0				797	837	710
Arrive On Green	0.00	0.33	0.33	0.07	0.45	0.00				0.45	0.45	0.45
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	891	330	157	647	0				339	401	612
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	20.0	15.7	3.9	10.9	0.0				11.4	13.3	30.7
Cycle Q Clear(g_c), s	0.0	20.0	15.7	3.9	10.9	0.0				11.4	13.3	30.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1155	515	231	1573	0				797	837	710
V/C Ratio(X)	0.00	0.77	0.64	0.68	0.41	0.00				0.43	0.48	0.86
Avail Cap(c_a), veh/h	0	1507	672	332	2029	0				1218	1279	1084
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	26.5	25.1	40.0	16.5	0.0				16.3	16.9	21.6
Incr Delay (d2), s/veh	0.0	1.9	1.3	3.5	0.2	0.0				0.4	0.4	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.4	5.8	1.7	4.2	0.0				4.5	5.5	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.4	26.4	43.5	16.7	0.0				16.7	17.3	26.3
LnGrp LOS	A	C	C	D	B	A				B	B	C
Approach Vol, veh/h		1221			804						1352	
Approach Delay, s/veh		27.9			21.9						21.2	
Approach LOS		C			C						C	

Timer - Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			10.4	33.2		44.1		43.7
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			8.5	37.5		60.5		50.5
Max Q Clear Time (g_c+I1), s			5.9	22.0		32.7		12.9
Green Ext Time (p_c), s			0.1	6.8		6.9		5.1

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	632	603	227	369	57	347	143	436	160	170	20
Future Volume (veh/h)	10	632	603	227	369	57	347	143	436	160	170	20
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	687	655	247	401	62	377	155	474	174	185	22
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	24	1294	782	344	1049	161	428	573	644	215	306	36
Arrive On Green	0.01	0.26	0.26	0.10	0.34	0.34	0.24	0.31	0.31	0.12	0.19	0.19
Sat Flow, veh/h	1767	5066	1572	3428	3063	470	1767	1856	1572	1767	1627	194
Grp Volume(v), veh/h	11	687	655	247	230	233	377	155	474	174	0	207
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1771	1767	1856	1572	1767	0	1821
Q Serve(g_s), s	0.5	9.8	21.5	5.9	8.3	8.4	17.3	5.3	21.5	8.1	0.0	8.8
Cycle Q Clear(g_c), s	0.5	9.8	21.5	5.9	8.3	8.4	17.3	5.3	21.5	8.1	0.0	8.8
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	24	1294	782	344	603	606	428	573	644	215	0	343
V/C Ratio(X)	0.46	0.53	0.84	0.72	0.38	0.39	0.88	0.27	0.74	0.81	0.00	0.60
Avail Cap(c_a), veh/h	105	1294	782	753	733	736	766	908	927	437	0	551
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	0.00	1.00
Uniform Delay (d), s/veh	41.2	27.0	18.2	36.7	20.9	21.0	30.7	21.9	21.0	36.0	0.0	31.3
Incr Delay (d2), s/veh	13.3	0.4	8.0	2.8	0.4	0.4	6.1	0.3	1.8	7.1	0.0	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	0.3	3.9	11.7	2.5	3.4	3.4	7.8	2.3	7.7	3.8	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	27.4	26.2	39.5	21.3	21.4	36.8	22.2	22.8	43.2	0.0	33.0
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	A	C
Approach Vol, veh/h		1353			710			1006			381	
Approach Delay, s/veh		27.0			27.7			28.0			37.7	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.7	30.5	13.0	26.0	24.9	20.4	5.6	33.3				
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	20.8	41.2	18.5	21.5	36.5	25.5	5.0	35.0				
Max Q Clear Time (g_c+I1), s	10.1	23.5	7.9	23.5	19.3	10.8	2.5	10.4				
Green Ext Time (p_c), s	0.3	2.5	0.6	0.0	1.1	0.9	0.0	2.9				
Intersection Summary												
HCM 6th Ctrl Delay			28.6									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	509	0	29	0	0	1	238	425	4	5	369	605
Future Volume (veh/h)	509	0	29	0	0	1	238	425	4	5	369	605
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	553	0	32	0	0	1	259	462	4	5	401	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	817	0	364	0	0	3	336	1353	12	12	685	
Arrive On Green	0.23	0.00	0.23	0.00	0.00	0.00	0.19	0.38	0.38	0.01	0.19	0.00
Sat Flow, veh/h	3534	0	1572	0	0	1572	1767	3582	31	1767	3526	1572
Grp Volume(v), veh/h	553	0	32	0	0	1	259	227	239	5	401	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	0	1573	1767	1763	1850	1767	1763	1572
Q Serve(g_s), s	6.7	0.0	0.8	0.0	0.0	0.0	6.5	4.3	4.3	0.1	4.9	0.0
Cycle Q Clear(g_c), s	6.7	0.0	0.8	0.0	0.0	0.0	6.5	4.3	4.3	0.1	4.9	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	817	0	364	0	0	3	336	666	699	12	685	
V/C Ratio(X)	0.68	0.00	0.09	0.00	0.00	0.30	0.77	0.34	0.34	0.42	0.59	
Avail Cap(c_a), veh/h	2443	0	1087	0	0	602	1109	1743	1829	188	1649	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.5	0.0	14.2	0.0	0.0	23.4	18.1	10.4	10.4	23.3	17.2	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.1	0.0	0.0	43.6	3.7	0.3	0.3	21.9	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	2.5	0.0	0.2	0.0	0.0	0.1	2.7	1.4	1.5	0.1	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	0.0	14.3	0.0	0.0	67.0	21.8	10.7	10.7	45.2	18.0	0.0
LnGrp LOS	B	A	B	A	A	E	C	B	B	D	B	
Approach Vol, veh/h		585			1			725			406	A
Approach Delay, s/veh		17.3			67.0			14.7			18.4	
Approach LOS		B			E			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.8	22.3		15.4	13.4	13.6		4.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	46.5		32.5	29.5	22.0		18.0
Max Q Clear Time (g_c+I1), s	2.1	6.3		8.7	8.5	6.9		2.0
Green Ext Time (p_c), s	0.0	3.0		2.2	0.7	2.3		0.0

Intersection Summary		
HCM 6th Ctrl Delay		16.5
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	171	49	21	0	94
Future Vol, veh/h	0	171	49	21	0	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	186	53	23	0	102

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	53
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	1012
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	1012
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1012
HCM Lane V/C Ratio	-	-	-	0.101
HCM Control Delay (s)	-	-	-	9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	113	4	2	52	81	9	3	16	80	1	18
Future Volume (veh/h)	58	113	4	2	52	81	9	3	16	80	1	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	63	123	4	2	57	88	10	3	17	87	1	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	122	398	13	6	290	246	21	6	35	177	2	159
Arrive On Green	0.07	0.22	0.22	0.00	0.16	0.16	0.04	0.04	0.04	0.10	0.10	0.10
Sat Flow, veh/h	1767	1787	58	1767	1856	1572	553	166	940	1748	20	1572
Grp Volume(v), veh/h	63	0	127	2	57	88	30	0	0	88	0	20
Grp Sat Flow(s),veh/h/ln	1767	0	1845	1767	1856	1572	1659	0	0	1768	0	1572
Q Serve(g_s), s	1.0	0.0	1.6	0.0	0.8	1.4	0.5	0.0	0.0	1.3	0.0	0.3
Cycle Q Clear(g_c), s	1.0	0.0	1.6	0.0	0.8	1.4	0.5	0.0	0.0	1.3	0.0	0.3
Prop In Lane	1.00		0.03	1.00		1.00	0.33		0.57	0.99		1.00
Lane Grp Cap(c), veh/h	122	0	411	6	290	246	62	0	0	179	0	159
V/C Ratio(X)	0.52	0.00	0.31	0.32	0.20	0.36	0.49	0.00	0.00	0.49	0.00	0.13
Avail Cap(c_a), veh/h	1281	0	2447	594	1739	1474	1496	0	0	1844	0	1640
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	9.2	14.1	10.4	10.7	13.4	0.0	0.0	12.0	0.0	11.6
Incr Delay (d2), s/veh	3.4	0.0	0.4	26.9	0.3	0.9	5.9	0.0	0.0	2.1	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	0.4	0.0	0.5	0.1	0.2	0.4	0.2	0.0	0.0	0.5	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	0.0	9.6	41.0	10.7	11.5	19.2	0.0	0.0	14.1	0.0	11.9
LnGrp LOS	B	A	A	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		190			147			30			108	
Approach Delay, s/veh		11.7			11.6			19.2			13.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		5.5	4.6	10.8		7.4	6.5	8.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		25.5	9.5	37.5		29.5	20.5	26.5				
Max Q Clear Time (g_c+I1), s		2.5	2.0	3.6		3.3	3.0	3.4				
Green Ext Time (p_c), s		0.1	0.0	0.7		0.5	0.1	0.5				

Intersection Summary			
HCM 6th Ctrl Delay			12.6
HCM 6th LOS			B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	181	65	71	403	377	129
Future Volume (veh/h)	181	65	71	403	377	129
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	197	71	77	438	410	140
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	309	275	138	1897	819	277
Arrive On Green	0.17	0.17	0.08	0.54	0.32	0.32
Sat Flow, veh/h	1767	1572	1767	3618	2680	874
Grp Volume(v), veh/h	197	71	77	438	278	272
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1698
Q Serve(g_s), s	3.2	1.2	1.3	2.1	4.0	4.1
Cycle Q Clear(g_c), s	3.2	1.2	1.3	2.1	4.0	4.1
Prop In Lane	1.00	1.00	1.00			0.51
Lane Grp Cap(c), veh/h	309	275	138	1897	558	538
V/C Ratio(X)	0.64	0.26	0.56	0.23	0.50	0.51
Avail Cap(c_a), veh/h	2171	1932	1156	8156	2672	2574
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	12.0	11.2	13.9	3.8	8.7	8.7
Incr Delay (d2), s/veh	2.2	0.5	3.5	0.1	0.7	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	1.1	0.0	0.5	0.3	1.1	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.2	11.7	17.4	3.9	9.4	9.5
LnGrp LOS	B	B	B	A	A	A
Approach Vol, veh/h	268			515	550	
Approach Delay, s/veh	13.5			5.9	9.4	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		21.4		10.0	6.9	14.4
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		72.5		38.5	20.5	47.5
Max Q Clear Time (g_c+I1), s		4.1		5.2	3.3	6.1
Green Ext Time (p_c), s		3.3		0.8	0.1	3.8

Intersection Summary			
HCM 6th Ctrl Delay			8.9
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	683	111	317	720	525	79	155	355	551	198	117
Future Volume (veh/h)	55	683	111	317	720	525	79	155	355	551	198	117
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	60	742	121	345	783	571	86	168	386	599	215	127
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	77	1299	403	440	1203	864	110	781	550	714	681	577
Arrive On Green	0.04	0.26	0.26	0.13	0.34	0.34	0.06	0.22	0.22	0.21	0.37	0.37
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	60	742	121	345	783	571	86	168	386	599	215	127
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	3.3	12.4	6.0	9.5	18.3	24.9	4.7	3.8	20.5	16.3	8.0	5.4
Cycle Q Clear(g_c), s	3.3	12.4	6.0	9.5	18.3	24.9	4.7	3.8	20.5	16.3	8.0	5.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	77	1299	403	440	1203	864	110	781	550	714	681	577
V/C Ratio(X)	0.78	0.57	0.30	0.78	0.65	0.66	0.78	0.22	0.70	0.84	0.32	0.22
Avail Cap(c_a), veh/h	177	1299	403	865	1427	964	228	781	550	1113	774	656
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	45.9	31.4	29.1	41.0	27.1	15.5	44.8	30.9	27.2	36.9	22.0	21.1
Incr Delay (d2), s/veh	15.2	0.6	0.4	3.1	0.8	1.5	11.1	0.1	4.0	3.5	0.3	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	1.7	5.0	2.3	4.1	7.6	8.7	2.4	1.6	8.1	7.0	3.5	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.1	32.0	29.5	44.1	27.9	16.9	56.0	31.0	31.1	40.3	22.2	21.3
LnGrp LOS	E	C	C	D	C	B	E	C	C	D	C	C
Approach Vol, veh/h		923			1699			640			941	
Approach Delay, s/veh		33.6			27.5			34.4			33.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.7	26.0	17.0	29.4	10.6	40.1	8.7	37.6
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	31.5	21.5	24.5	24.5	12.5	40.5	9.7	39.3
Max Q Clear Time (g_c+I1), s	18.3	22.5	11.5	14.4	6.7	10.0	5.3	26.9
Green Ext Time (p_c), s	1.9	0.0	1.0	3.9	0.1	1.7	0.0	6.2

Intersection Summary	
HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	6	4	84	4	99	0	384	51	145	417	7
Future Volume (veh/h)	7	6	4	84	4	99	0	384	51	145	417	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	8	7	4	91	4	108	0	417	55	158	453	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	191	112	43	386	8	198	5	600	79	214	1129	20
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.00	0.37	0.37	0.12	0.62	0.62
Sat Flow, veh/h	378	888	337	1489	65	1572	1767	1606	212	1767	1818	32
Grp Volume(v), veh/h	19	0	0	95	0	108	0	0	472	158	0	461
Grp Sat Flow(s),veh/h/ln	1603	0	0	1555	0	1572	1767	0	1817	1767	0	1850
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	7.8	3.1	0.0	4.5
Cycle Q Clear(g_c), s	1.8	0.0	0.0	1.8	0.0	2.3	0.0	0.0	7.8	3.1	0.0	4.5
Prop In Lane	0.42		0.21	0.96		1.00	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	346	0	0	394	0	198	5	0	679	214	0	1149
V/C Ratio(X)	0.05	0.00	0.00	0.24	0.00	0.54	0.00	0.00	0.69	0.74	0.00	0.40
Avail Cap(c_a), veh/h	1107	0	0	1105	0	993	248	0	3036	1215	0	4103
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.7	0.0	0.0	14.4	0.0	14.6	0.0	0.0	9.4	15.1	0.0	3.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	2.3	0.0	0.0	1.3	4.9	0.0	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	0.1	0.0	0.0	0.6	0.0	0.8	0.0	0.0	2.4	1.3	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	0.0	0.0	14.7	0.0	16.9	0.0	0.0	10.7	20.0	0.0	3.6
LnGrp LOS	B	A	A	B	A	B	A	A	B	C	A	A
Approach Vol, veh/h		19			203			472			619	
Approach Delay, s/veh		13.8			15.9			10.7			7.8	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.8	17.8		9.0	0.0	26.6		9.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	24.5	59.5		22.5	5.0	79.0		22.5
Max Q Clear Time (g_c+I1), s	5.1	9.8		3.8	0.0	6.5		4.3
Green Ext Time (p_c), s	0.4	3.5		0.0	0.0	3.4		0.8

Intersection Summary			
HCM 6th Ctrl Delay			10.2
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	202	4	22	190	6	0	0	4	2	0	0
Future Vol, veh/h	1	202	4	22	190	6	0	0	4	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	220	4	24	207	7	0	0	4	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	214	0	0	224	0	0	483	486	222	485	485	211
Stage 1	-	-	-	-	-	-	224	224	-	259	259	-
Stage 2	-	-	-	-	-	-	259	262	-	226	226	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1350	-	-	1339	-	-	492	480	815	491	481	827
Stage 1	-	-	-	-	-	-	776	716	-	744	692	-
Stage 2	-	-	-	-	-	-	744	690	-	774	715	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1350	-	-	1339	-	-	485	471	815	481	472	827
Mov Cap-2 Maneuver	-	-	-	-	-	-	485	471	-	481	472	-
Stage 1	-	-	-	-	-	-	775	715	-	743	680	-
Stage 2	-	-	-	-	-	-	731	678	-	769	714	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.8	9.4	12.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	815	1350	-	-	1339	-	-	481
HCM Lane V/C Ratio	0.005	0.001	-	-	0.018	-	-	0.005
HCM Control Delay (s)	9.4	7.7	0	-	7.7	-	-	12.5
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0.1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	160	48	180	197	1	19	1	87	2	1	1
Future Volume (veh/h)	1	160	48	180	197	1	19	1	87	2	1	1
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	1	174	52	196	214	1	21	1	95	2	1	1
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	7	515	149	273	635	3	431	14	422	280	68	44
Arrive On Green	0.00	0.19	0.19	0.15	0.34	0.34	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	2696	782	1767	1845	9	1310	124	1572	558	598	385
Grp Volume(v), veh/h	1	112	114	196	0	215	22	0	95	4	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1715	1767	0	1854	1434	0	1572	1541	0	0
Q Serve(g_s), s	0.0	1.4	1.4	2.6	0.0	2.1	0.2	0.0	1.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.4	1.4	2.6	0.0	2.1	0.3	0.0	1.2	0.0	0.0	0.0
Prop In Lane	1.00		0.46	1.00		0.00	0.95		1.00	0.50		0.25
Lane Grp Cap(c), veh/h	7	337	327	273	0	638	445	0	422	392	0	0
V/C Ratio(X)	0.14	0.33	0.35	0.72	0.00	0.34	0.05	0.00	0.23	0.01	0.00	0.00
Avail Cap(c_a), veh/h	672	1871	1820	2512	0	3898	1676	0	1786	1664	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.4	8.7	8.8	10.0	0.0	6.1	9.9	0.0	7.1	9.8	0.0	0.0
Incr Delay (d2), s/veh	8.8	0.6	0.6	3.5	0.0	0.3	0.0	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	0.0	0.4	0.4	0.9	0.0	0.5	0.1	0.0	0.3	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	9.3	9.4	13.5	0.0	6.4	10.0	0.0	7.4	9.8	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		227			411			117			4	
Approach Delay, s/veh		9.4			9.8			7.9			9.8	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.3	8.4	9.3		7.3	4.5	13.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		24.5	35.5	26.5		24.5	9.5	52.5				
Max Q Clear Time (g_c+I1), s		3.2	4.6	3.4		2.0	2.0	4.1				
Green Ext Time (p_c), s		0.4	0.6	1.2		0.0	0.0	1.4				

Intersection Summary			
HCM 6th Ctrl Delay			9.4
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	185	56	261	383	149	43	63	193	177	79	52
Future Volume (veh/h)	26	185	56	261	383	149	43	63	193	177	79	52
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	201	61	284	416	162	47	68	210	192	86	57
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	57	599	267	465	679	262	86	598	480	256	937	418
Arrive On Green	0.03	0.17	0.17	0.14	0.27	0.27	0.05	0.17	0.17	0.14	0.27	0.27
Sat Flow, veh/h	1767	3526	1572	3428	2488	958	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	28	201	61	284	293	285	47	68	210	192	86	57
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1683	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	0.7	2.4	1.6	3.7	6.9	7.0	1.2	0.8	5.1	4.9	0.9	1.3
Cycle Q Clear(g_c), s	0.7	2.4	1.6	3.7	6.9	7.0	1.2	0.8	5.1	4.9	0.9	1.3
Prop In Lane	1.00		1.00	1.00		0.57	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	57	599	267	465	481	459	86	598	480	256	937	418
V/C Ratio(X)	0.49	0.34	0.23	0.61	0.61	0.62	0.55	0.11	0.44	0.75	0.09	0.14
Avail Cap(c_a), veh/h	354	1898	847	1629	1433	1368	466	1749	993	1138	3089	1378
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	22.5	17.3	17.0	19.3	15.0	15.1	22.0	16.7	13.2	19.4	13.1	13.2
Incr Delay (d2), s/veh	6.3	0.3	0.4	1.3	1.3	1.4	5.3	0.1	0.6	4.4	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	0.4	0.9	0.5	1.4	2.5	2.5	0.6	0.3	1.6	2.1	0.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	17.6	17.4	20.6	16.3	16.4	27.3	16.7	13.8	23.8	13.1	13.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		290			862			325			335	
Approach Delay, s/veh		18.7			17.7			16.4			19.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	12.5	10.9	12.5	6.8	17.1	6.0	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	30.5	23.5	22.5	25.5	12.5	41.5	9.5	38.5
Max Q Clear Time (g_c+I1), s	6.9	7.1	5.7	4.4	3.2	3.3	2.7	9.0
Green Ext Time (p_c), s	0.5	1.0	0.9	1.4	0.0	0.7	0.0	3.9

Intersection Summary	
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	400	182	257	375	0	0	0	0	464	151	454
Future Volume (veh/h)	0	400	182	257	375	0	0	0	0	464	151	454
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	435	198	279	408	0				334	402	428
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	777	347	444	1544	0				682	716	607
Arrive On Green	0.00	0.22	0.22	0.13	0.44	0.00				0.39	0.39	0.39
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	435	198	279	408	0				334	402	428
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	5.6	5.7	3.9	3.8	0.0				7.3	8.7	11.8
Cycle Q Clear(g_c), s	0.0	5.6	5.7	3.9	3.8	0.0				7.3	8.7	11.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	777	347	444	1544	0				682	716	607
V/C Ratio(X)	0.00	0.56	0.57	0.63	0.26	0.00				0.49	0.56	0.70
Avail Cap(c_a), veh/h	0	1963	876	1373	3685	0				1985	2085	1767
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.7	17.8	21.1	9.1	0.0				11.9	12.3	13.3
Incr Delay (d2), s/veh	0.0	0.6	1.5	1.5	0.1	0.0				0.5	0.7	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
%ile BackOfQ(50%),veh/ln	0.0	2.1	2.0	1.5	1.2	0.0				2.5	3.1	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.4	19.3	22.6	9.2	0.0				12.4	13.0	14.8
LnGrp LOS	A	B	B	C	A	A				B	B	B
Approach Vol, veh/h		633			687						1164	
Approach Delay, s/veh		18.7			14.6						13.5	
Approach LOS		B			B						B	

Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			11.1	15.8		24.3		26.9				
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s			20.5	28.5		57.5		53.5				
Max Q Clear Time (g_c+I1), s			5.9	7.7		13.8		5.8				
Green Ext Time (p_c), s			0.8	3.5		6.0		3.0				

Intersection Summary			
HCM 6th Ctrl Delay			15.1
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	362	486	294	480	85	161	92	219	80	95	19
Future Volume (veh/h)	9	362	486	294	480	85	161	92	219	80	95	19
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	10	393	528	320	522	92	175	100	238	87	103	21
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	23	1640	713	468	1341	235	229	332	496	113	169	35
Arrive On Green	0.01	0.32	0.32	0.14	0.45	0.45	0.13	0.18	0.18	0.06	0.11	0.11
Sat Flow, veh/h	1767	5066	1572	3428	2997	526	1767	1856	1572	1767	1496	305
Grp Volume(v), veh/h	10	393	528	320	306	308	175	100	238	87	0	124
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1761	1767	1856	1572	1767	0	1801
Q Serve(g_s), s	0.3	3.4	16.8	5.4	7.0	7.1	5.8	2.8	7.4	2.9	0.0	4.0
Cycle Q Clear(g_c), s	0.3	3.4	16.8	5.4	7.0	7.1	5.8	2.8	7.4	2.9	0.0	4.0
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	23	1640	713	468	789	788	229	332	496	113	0	204
V/C Ratio(X)	0.44	0.24	0.74	0.68	0.39	0.39	0.76	0.30	0.48	0.77	0.00	0.61
Avail Cap(c_a), veh/h	160	1713	736	1159	1032	1031	1093	1423	1421	423	0	698
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	0.00	1.00
Uniform Delay (d), s/veh	29.7	15.0	13.6	24.9	11.2	11.2	25.5	21.6	16.8	27.9	0.0	25.6
Incr Delay (d2), s/veh	13.0	0.1	3.9	1.8	0.3	0.3	5.2	0.5	0.7	10.4	0.0	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	0.2	1.2	5.8	2.2	2.4	2.5	2.6	1.2	2.5	1.5	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	15.1	17.5	26.7	11.5	11.5	30.7	22.1	17.5	38.3	0.0	28.5
LnGrp LOS	D	B	B	C	B	B	C	C	B	D	A	C
Approach Vol, veh/h		931			934			513			211	
Approach Delay, s/veh		16.8			16.7			22.9			32.5	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	15.3	12.8	24.1	12.4	11.4	5.3	31.6
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	14.5	46.5	20.5	20.5	37.5	23.5	5.5	35.5
Max Q Clear Time (g_c+I1), s	4.9	9.4	7.4	18.8	7.8	6.0	2.3	9.1
Green Ext Time (p_c), s	0.1	1.4	0.9	0.9	0.5	0.5	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	2	51	0	0	0	96	211	3	11	501	356
Future Volume (veh/h)	271	2	51	0	0	0	96	211	3	11	501	356
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	296	0	55	0	0	0	104	229	3	12	545	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	594	0	264	0	6	0	167	1402	18	28	1110	
Arrive On Green	0.17	0.00	0.17	0.00	0.00	0.00	0.09	0.39	0.39	0.02	0.31	0.00
Sat Flow, veh/h	3534	0	1572	0	1856	0	1767	3563	47	1767	3526	1572
Grp Volume(v), veh/h	296	0	55	0	0	0	104	113	119	12	545	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	1856	0	1767	1763	1847	1767	1763	1572
Q Serve(g_s), s	2.4	0.0	1.0	0.0	0.0	0.0	1.8	1.3	1.3	0.2	4.0	0.0
Cycle Q Clear(g_c), s	2.4	0.0	1.0	0.0	0.0	0.0	1.8	1.3	1.3	0.2	4.0	0.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	594	0	264	0	6	0	167	694	727	28	1110	
V/C Ratio(X)	0.50	0.00	0.21	0.00	0.00	0.00	0.62	0.16	0.16	0.43	0.49	
Avail Cap(c_a), veh/h	2932	0	1304	0	1046	0	1079	2814	2949	360	4194	
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.1	0.0	11.5	0.0	0.0	0.0	13.9	6.3	6.3	15.6	8.9	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.4	0.0	0.0	0.0	3.8	0.1	0.1	10.1	0.3	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.3	0.0	0.0	0.0	0.7	0.3	0.3	0.1	1.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	0.0	11.8	0.0	0.0	0.0	17.7	6.4	6.4	25.7	9.2	0.0
LnGrp LOS	B	A	B	A	A	A	B	A	A	C	A	
Approach Vol, veh/h		351			0			336			557	A
Approach Delay, s/veh		12.6			0.0			9.9			9.6	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	17.1		9.9	7.5	14.6		0.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	6.5	51.0		26.5	19.5	38.0		18.0
Max Q Clear Time (g_c+I1), s	2.2	3.3		4.4	3.8	6.0		0.0
Green Ext Time (p_c), s	0.0	1.4		1.2	0.2	4.1		0.0

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	66	107	8	0	53
Future Vol, veh/h	0	66	107	8	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	72	116	9	0	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	116
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	934
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	934
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	934
HCM Lane V/C Ratio	-	-	-	0.062
HCM Control Delay (s)	-	-	-	9.1
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	68	8	10	85	24	3	0	4	15	1	11
Future Volume (veh/h)	17	68	8	10	85	24	3	0	4	15	1	11
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	18	74	9	11	92	26	3	0	4	16	1	12
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	42	274	33	26	297	251	7	0	9	61	4	58
Arrive On Green	0.02	0.17	0.17	0.01	0.16	0.16	0.01	0.00	0.01	0.04	0.04	0.04
Sat Flow, veh/h	1767	1623	197	1767	1856	1572	707	0	943	1668	104	1572
Grp Volume(v), veh/h	18	0	83	11	92	26	7	0	0	17	0	12
Grp Sat Flow(s),veh/h/ln	1767	0	1820	1767	1856	1572	1650	0	0	1772	0	1572
Q Serve(g_s), s	0.2	0.0	0.9	0.1	1.0	0.3	0.1	0.0	0.0	0.2	0.0	0.2
Cycle Q Clear(g_c), s	0.2	0.0	0.9	0.1	1.0	0.3	0.1	0.0	0.0	0.2	0.0	0.2
Prop In Lane	1.00		0.11	1.00		1.00	0.43		0.57	0.94		1.00
Lane Grp Cap(c), veh/h	42	0	307	26	297	251	16	0	0	65	0	58
V/C Ratio(X)	0.43	0.00	0.27	0.42	0.31	0.10	0.45	0.00	0.00	0.26	0.00	0.21
Avail Cap(c_a), veh/h	1323	0	3154	1021	2898	2456	1660	0	0	1858	0	1649
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.3	0.0	8.5	11.4	8.7	8.4	11.5	0.0	0.0	10.9	0.0	10.9
Incr Delay (d2), s/veh	6.9	0.0	0.5	10.5	0.6	0.2	18.6	0.0	0.0	2.1	0.0	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	0.1	0.0	0.3	0.1	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	0.0	8.9	21.9	9.3	8.6	30.1	0.0	0.0	13.0	0.0	12.7
LnGrp LOS	B	A	A	C	A	A	C	A	A	B	A	B
Approach Vol, veh/h		101			129			7			29	
Approach Delay, s/veh		10.6			10.2			30.1			12.9	
Approach LOS		B			B			C			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		4.7	4.8	8.4		5.4	5.1	8.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		23.5	13.5	40.5		24.5	17.5	36.5				
Max Q Clear Time (g_c+I1), s		2.1	2.1	2.9		2.2	2.2	3.0				
Green Ext Time (p_c), s		0.0	0.0	0.4		0.1	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			11.2									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	92	10	14	167	177	124
Future Volume (veh/h)	92	10	14	167	177	124
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	100	11	15	182	192	135
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	176	35	1700	525	350
Arrive On Green	0.11	0.11	0.02	0.48	0.26	0.26
Sat Flow, veh/h	1767	1572	1767	3618	2117	1351
Grp Volume(v), veh/h	100	11	15	182	166	161
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1612
Q Serve(g_s), s	1.2	0.1	0.2	0.6	1.7	1.8
Cycle Q Clear(g_c), s	1.2	0.1	0.2	0.6	1.7	1.8
Prop In Lane	1.00	1.00	1.00			0.84
Lane Grp Cap(c), veh/h	197	176	35	1700	457	418
V/C Ratio(X)	0.51	0.06	0.43	0.11	0.36	0.39
Avail Cap(c_a), veh/h	3149	2802	1395	11373	3937	3601
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	9.3	8.8	10.7	3.1	6.7	6.8
Incr Delay (d2), s/veh	2.0	0.1	8.0	0.0	0.5	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	0.4	0.1	0.1	0.0	0.4	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.3	9.0	18.7	3.2	7.2	7.3
LnGrp LOS	B	A	B	A	A	A
Approach Vol, veh/h	111			197	327	
Approach Delay, s/veh	11.0			4.3	7.3	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		15.2		7.0	4.9	10.2
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		71.5		39.5	17.5	49.5
Max Q Clear Time (g_c+I1), s		2.6		3.2	2.2	3.8
Green Ext Time (p_c), s		1.3		0.3	0.0	2.2

Intersection Summary						
HCM 6th Ctrl Delay			7.0			
HCM 6th LOS			A			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	468	39	259	431	300	51	74	186	267	85	61
Future Volume (veh/h)	59	468	39	259	431	300	51	74	186	267	85	61
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	509	42	282	468	326	55	80	202	290	92	66
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	1058	328	455	996	659	94	578	466	467	458	388
Arrive On Green	0.06	0.21	0.21	0.13	0.28	0.28	0.05	0.16	0.16	0.14	0.25	0.25
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	64	509	42	282	468	326	55	80	202	290	92	66
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	1.8	4.4	1.1	3.9	5.5	7.6	1.5	1.0	5.2	4.0	2.0	1.7
Cycle Q Clear(g_c), s	1.8	4.4	1.1	3.9	5.5	7.6	1.5	1.0	5.2	4.0	2.0	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	104	1058	328	455	996	659	94	578	466	467	458	388
V/C Ratio(X)	0.62	0.48	0.13	0.62	0.47	0.49	0.58	0.14	0.43	0.62	0.20	0.17
Avail Cap(c_a), veh/h	545	2773	861	1604	2492	1326	510	1720	975	1809	1348	1143
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	23.1	17.5	16.2	20.6	14.9	10.7	23.2	18.0	14.3	20.5	15.0	14.9
Incr Delay (d2), s/veh	5.8	0.3	0.2	1.4	0.3	0.6	5.6	0.1	0.6	1.4	0.2	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	0.8	1.6	0.4	1.5	2.0	2.2	0.7	0.4	1.7	1.5	0.8	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	17.8	16.3	22.0	15.2	11.3	28.8	18.1	14.9	21.8	15.2	15.1
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		615			1076			337			448	
Approach Delay, s/veh		18.9			15.8			17.9			19.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	12.7	11.2	15.0	7.2	16.9	7.5	18.7
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	26.5	24.5	23.5	27.5	14.5	36.5	15.5	35.5
Max Q Clear Time (g_c+I1), s	6.0	7.2	5.9	6.4	3.5	4.0	3.8	9.6
Green Ext Time (p_c), s	1.0	1.0	0.9	3.6	0.1	0.7	0.1	4.6

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1	3	62	8	185	10	510	83	178	553	3
Future Volume (veh/h)	10	1	3	62	8	185	10	510	83	178	553	3
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	1	3	67	9	201	11	554	90	193	601	3
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	237	30	38	343	39	268	25	688	112	251	1051	5
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.01	0.44	0.44	0.14	0.57	0.57
Sat Flow, veh/h	724	177	225	1291	227	1572	1767	1557	253	1767	1845	9
Grp Volume(v), veh/h	15	0	0	76	0	201	11	0	644	193	0	604
Grp Sat Flow(s),veh/h/ln	1126	0	0	1518	0	1572	1767	0	1810	1767	0	1854
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	6.7	0.3	0.0	16.9	5.8	0.0	11.4
Cycle Q Clear(g_c), s	2.0	0.0	0.0	2.0	0.0	6.7	0.3	0.0	16.9	5.8	0.0	11.4
Prop In Lane	0.73		0.20	0.88		1.00	1.00		0.14	1.00		0.00
Lane Grp Cap(c), veh/h	305	0	0	382	0	268	25	0	800	251	0	1056
V/C Ratio(X)	0.05	0.00	0.00	0.20	0.00	0.75	0.44	0.00	0.81	0.77	0.00	0.57
Avail Cap(c_a), veh/h	538	0	0	649	0	558	177	0	2093	756	0	2751
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	0.0	19.7	0.0	21.7	26.9	0.0	13.3	22.7	0.0	7.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	4.2	11.9	0.0	2.0	4.9	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	0.2	0.0	0.0	0.8	0.0	2.6	0.2	0.0	6.1	2.6	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	0.0	0.0	20.0	0.0	25.9	38.7	0.0	15.3	27.6	0.0	8.0
LnGrp LOS	B	A	A	B	A	C	D	A	B	C	A	A
Approach Vol, veh/h		15			277			655			797	
Approach Delay, s/veh		19.1			24.3			15.6			12.8	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.3	28.8		13.9	5.3	35.8		13.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	23.5	63.5		19.5	5.5	81.5		19.5				
Max Q Clear Time (g_c+I1), s	7.8	18.9		4.0	2.3	13.4		8.7				
Green Ext Time (p_c), s	0.5	5.3		0.0	0.0	4.8		0.8				

Intersection Summary			
HCM 6th Ctrl Delay			15.7
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	298	1	11	266	6	7	1	18	4	0	1
Future Vol, veh/h	0	298	1	11	266	6	7	1	18	4	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	324	1	12	289	7	8	1	20	4	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	296	0	0	325	0	0	642	645	325	652	642	293
Stage 1	-	-	-	-	-	-	325	325	-	317	317	-
Stage 2	-	-	-	-	-	-	317	320	-	335	325	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1260	-	-	1229	-	-	386	390	714	380	391	744
Stage 1	-	-	-	-	-	-	685	647	-	692	652	-
Stage 2	-	-	-	-	-	-	692	651	-	677	647	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1260	-	-	1229	-	-	383	386	714	366	387	744
Mov Cap-2 Maneuver	-	-	-	-	-	-	383	386	-	366	387	-
Stage 1	-	-	-	-	-	-	685	647	-	692	645	-
Stage 2	-	-	-	-	-	-	684	644	-	657	647	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	11.7	14
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	564	1260	-	-	1229	-	-	407
HCM Lane V/C Ratio	0.05	-	-	-	0.01	-	-	0.013
HCM Control Delay (s)	11.7	0	-	-	8	-	-	14
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	210	89	342	193	1	88	6	275	4	4	2
Future Volume (veh/h)	3	210	89	342	193	1	88	6	275	4	4	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	3	228	97	372	210	1	96	7	299	4	4	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	7	436	180	478	822	4	448	27	754	207	175	64
Arrive On Green	0.00	0.18	0.18	0.27	0.45	0.45	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1767	2434	1003	1767	1845	9	1304	128	1572	379	836	304
Grp Volume(v), veh/h	3	163	162	372	0	211	103	0	299	10	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1675	1767	0	1854	1431	0	1572	1519	0	0
Q Serve(g_s), s	0.1	3.3	3.5	7.7	0.0	2.8	2.2	0.0	4.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	3.3	3.5	7.7	0.0	2.8	2.4	0.0	4.8	0.2	0.0	0.0
Prop In Lane	1.00		0.60	1.00		0.00	0.93		1.00	0.40		0.20
Lane Grp Cap(c), veh/h	7	316	300	478	0	826	475	0	754	445	0	0
V/C Ratio(X)	0.41	0.52	0.54	0.78	0.00	0.26	0.22	0.00	0.40	0.02	0.00	0.00
Avail Cap(c_a), veh/h	246	914	868	1810	0	2602	1095	0	1439	1052	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.6	14.7	14.7	13.3	0.0	6.9	13.3	0.0	6.6	12.4	0.0	0.0
Incr Delay (d2), s/veh	33.7	1.3	1.5	2.8	0.0	0.2	0.2	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	0.1	1.2	1.2	2.8	0.0	0.8	0.7	0.0	1.1	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.3	16.0	16.3	16.1	0.0	7.0	13.5	0.0	7.0	12.5	0.0	0.0
LnGrp LOS	D	B	B	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		328			583			402			10	
Approach Delay, s/veh		16.5			12.8			8.6			12.5	
Approach LOS		B			B			A			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.8	15.2	11.6		12.8	4.7	22.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		25.5	40.5	20.5		25.5	5.5	55.5				
Max Q Clear Time (g_c+I1), s		6.8	9.7	5.5		2.2	2.1	4.8				
Green Ext Time (p_c), s		1.5	1.2	1.6		0.0	0.0	1.3				
Intersection Summary												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	386	150	462	428	206	88	158	469	164	142	46
Future Volume (veh/h)	44	386	150	462	428	206	88	158	469	164	142	46
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	48	420	163	502	465	224	96	172	510	178	154	50
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	74	611	272	647	741	354	125	983	735	222	1178	525
Arrive On Green	0.04	0.17	0.17	0.19	0.32	0.32	0.07	0.28	0.28	0.13	0.33	0.33
Sat Flow, veh/h	1767	3526	1572	3428	2313	1106	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	48	420	163	502	354	335	96	172	510	178	154	50
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1656	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	2.1	8.6	7.4	10.7	13.2	13.3	4.1	2.9	19.7	7.6	2.3	1.7
Cycle Q Clear(g_c), s	2.1	8.6	7.4	10.7	13.2	13.3	4.1	2.9	19.7	7.6	2.3	1.7
Prop In Lane	1.00		1.00	1.00		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	74	611	272	647	565	530	125	983	735	222	1178	525
V/C Ratio(X)	0.65	0.69	0.60	0.78	0.63	0.63	0.77	0.17	0.69	0.80	0.13	0.10
Avail Cap(c_a), veh/h	218	1074	479	1534	1109	1042	332	983	735	516	1349	602
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	36.4	29.9	29.4	29.7	22.3	22.3	35.2	21.1	16.2	32.8	17.9	17.7
Incr Delay (d2), s/veh	9.3	1.4	2.1	2.0	1.1	1.3	9.6	0.1	2.8	6.5	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	1.1	3.7	2.9	4.4	5.3	5.1	2.1	1.1	7.0	3.5	0.9	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	31.3	31.5	31.8	23.4	23.6	44.8	21.2	19.0	39.3	17.9	17.7
LnGrp LOS	D	C	C	C	C	C	D	C	B	D	B	B
Approach Vol, veh/h		631			1191			778			382	
Approach Delay, s/veh		32.5			27.0			22.7			27.9	
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	26.0	19.1	17.9	9.9	30.3	7.7	29.2
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	22.5	21.5	34.5	23.5	14.5	29.5	9.5	48.5
Max Q Clear Time (g_c+I1), s	9.6	21.7	12.7	10.6	6.1	4.3	4.1	15.3
Green Ext Time (p_c), s	0.4	0.0	1.8	2.7	0.1	1.1	0.0	5.0

Intersection Summary	
HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	755	251	158	551	0	0	0	0	501	185	597
Future Volume (veh/h)	0	755	251	158	551	0	0	0	0	501	185	597
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	821	273	172	599	0				373	442	584
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1105	493	256	1564	0				786	826	700
Arrive On Green	0.00	0.31	0.31	0.07	0.44	0.00				0.44	0.44	0.44
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	821	273	172	599	0				373	442	584
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	16.8	11.7	4.0	9.2	0.0				12.0	14.0	26.5
Cycle Q Clear(g_c), s	0.0	16.8	11.7	4.0	9.2	0.0				12.0	14.0	26.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1105	493	256	1564	0				786	826	700
V/C Ratio(X)	0.00	0.74	0.55	0.67	0.38	0.00				0.47	0.54	0.83
Avail Cap(c_a), veh/h	0	1592	710	445	2247	0				1301	1366	1158
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	24.8	23.0	36.4	15.1	0.0				15.8	16.3	19.8
Incr Delay (d2), s/veh	0.0	1.1	1.0	3.1	0.2	0.0				0.4	0.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.9	4.3	1.7	3.5	0.0				4.6	5.7	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	25.9	24.0	39.5	15.2	0.0				16.2	16.9	22.6
LnGrp LOS	A	C	C	D	B	A				B	B	C
Approach Vol, veh/h		1094			771						1399	
Approach Delay, s/veh		25.5			20.6						19.1	
Approach LOS		C			C						B	

Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.5	29.8		40.5		40.4				
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s			10.5	36.5		59.5		51.5				
Max Q Clear Time (g_c+I1), s			6.0	18.8		28.5		11.2				
Green Ext Time (p_c), s			0.2	6.5		7.5		4.7				

Intersection Summary			
HCM 6th Ctrl Delay			21.6
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	661	550	250	378	63	306	157	480	176	187	22
Future Volume (veh/h)	11	661	550	250	378	63	306	157	480	176	187	22
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	718	598	272	411	68	333	171	522	191	203	24
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	1202	709	368	1001	164	378	606	682	230	396	47
Arrive On Green	0.01	0.24	0.24	0.11	0.33	0.33	0.21	0.33	0.33	0.13	0.24	0.24
Sat Flow, veh/h	1767	5066	1572	3428	3031	498	1767	1856	1572	1767	1628	193
Grp Volume(v), veh/h	12	718	598	272	238	241	333	171	522	191	0	227
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1766	1767	1856	1572	1767	0	1821
Q Serve(g_s), s	0.6	11.4	21.5	7.0	9.5	9.6	16.5	6.2	25.5	9.5	0.0	9.8
Cycle Q Clear(g_c), s	0.6	11.4	21.5	7.0	9.5	9.6	16.5	6.2	25.5	9.5	0.0	9.8
Prop In Lane	1.00		1.00	1.00		0.28	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	25	1202	709	368	582	583	378	606	682	230	0	442
V/C Ratio(X)	0.47	0.60	0.84	0.74	0.41	0.41	0.88	0.28	0.77	0.83	0.00	0.51
Avail Cap(c_a), veh/h	97	1202	709	851	759	760	614	737	793	429	0	532
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	0.00	1.00
Uniform Delay (d), s/veh	44.3	30.7	22.0	39.2	23.5	23.5	34.5	22.6	21.8	38.4	0.0	29.7
Incr Delay (d2), s/veh	13.0	0.8	9.1	2.9	0.5	0.5	8.6	0.3	3.9	7.4	0.0	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	0.4	4.6	12.3	3.0	3.9	4.0	7.8	2.7	9.6	4.6	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.3	31.5	31.1	42.1	24.0	24.0	43.1	22.9	25.6	45.9	0.0	30.6
LnGrp LOS	E	C	C	D	C	C	D	C	C	D	A	C
Approach Vol, veh/h		1328			751			1026			418	
Approach Delay, s/veh		31.6			30.6			30.8			37.6	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	34.1	14.2	26.0	23.9	26.5	5.8	34.4
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	22.0	36.0	22.5	21.5	31.5	26.5	5.0	39.0
Max Q Clear Time (g_c+I1), s	11.5	27.5	9.0	23.5	18.5	11.8	2.6	11.6
Green Ext Time (p_c), s	0.4	2.1	0.8	0.0	0.8	1.1	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	31.9
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	491	0	32	0	0	1	262	461	4	6	398	560
Future Volume (veh/h)	491	0	32	0	0	1	262	461	4	6	398	560
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	534	0	35	0	0	1	285	501	4	7	433	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	774	0	344	0	0	3	362	1456	12	16	743	
Arrive On Green	0.22	0.00	0.22	0.00	0.00	0.00	0.20	0.41	0.41	0.01	0.21	0.00
Sat Flow, veh/h	3534	0	1572	0	0	1572	1767	3585	29	1767	3526	1572
Grp Volume(v), veh/h	534	0	35	0	0	1	285	246	259	7	433	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	0	1573	1767	1763	1850	1767	1763	1572
Q Serve(g_s), s	6.9	0.0	0.9	0.0	0.0	0.0	7.6	4.8	4.8	0.2	5.5	0.0
Cycle Q Clear(g_c), s	6.9	0.0	0.9	0.0	0.0	0.0	7.6	4.8	4.8	0.2	5.5	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	774	0	344	0	0	3	362	716	752	16	743	
V/C Ratio(X)	0.69	0.00	0.10	0.00	0.00	0.31	0.79	0.34	0.34	0.43	0.58	
Avail Cap(c_a), veh/h	1824	0	812	0	0	573	948	1909	2004	179	2283	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.8	0.0	15.4	0.0	0.0	24.6	18.6	10.1	10.1	24.3	17.5	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.1	0.0	0.0	48.4	3.8	0.3	0.3	16.6	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	2.6	0.0	0.3	0.0	0.0	0.1	3.1	1.6	1.6	0.2	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.9	0.0	15.5	0.0	0.0	73.0	22.5	10.4	10.4	41.0	18.3	0.0
LnGrp LOS	B	A	B	A	A	E	C	B	B	D	B	
Approach Vol, veh/h		569			1			790			440	A
Approach Delay, s/veh		18.7			73.0			14.8			18.6	
Approach LOS		B			E			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	24.6		15.3	14.6	14.9		4.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	53.5		25.5	26.5	32.0		18.0
Max Q Clear Time (g_c+I1), s	2.2	6.8		8.9	9.6	7.5		2.0
Green Ext Time (p_c), s	0.0	3.4		1.9	0.8	3.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		17.0
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	1.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	154	54	8	0	47
Future Vol, veh/h	0	154	54	8	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	167	59	9	0	51

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	59
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	1004
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	1004
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1004
HCM Lane V/C Ratio	-	-	-	0.051
HCM Control Delay (s)	-	-	-	8.8
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	124	4	2	42	45	10	3	18	31	1	20
Future Volume (veh/h)	30	124	4	2	42	45	10	3	18	31	1	20
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	33	135	4	2	46	49	11	3	20	34	1	22
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	72	351	10	7	293	248	22	6	41	112	3	102
Arrive On Green	0.04	0.20	0.20	0.00	0.16	0.16	0.04	0.04	0.04	0.06	0.06	0.06
Sat Flow, veh/h	1767	1793	53	1767	1856	1572	535	146	973	1719	51	1572
Grp Volume(v), veh/h	33	0	139	2	46	49	34	0	0	35	0	22
Grp Sat Flow(s),veh/h/ln	1767	0	1846	1767	1856	1572	1654	0	0	1770	0	1572
Q Serve(g_s), s	0.5	0.0	1.7	0.0	0.6	0.7	0.5	0.0	0.0	0.5	0.0	0.3
Cycle Q Clear(g_c), s	0.5	0.0	1.7	0.0	0.6	0.7	0.5	0.0	0.0	0.5	0.0	0.3
Prop In Lane	1.00		0.03	1.00		1.00	0.32		0.59	0.97		1.00
Lane Grp Cap(c), veh/h	72	0	361	7	293	248	69	0	0	115	0	102
V/C Ratio(X)	0.46	0.00	0.38	0.29	0.16	0.20	0.49	0.00	0.00	0.30	0.00	0.22
Avail Cap(c_a), veh/h	1125	0	2672	784	2327	1972	1819	0	0	1673	0	1487
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.1	0.0	9.1	12.9	9.4	9.5	12.1	0.0	0.0	11.6	0.0	11.5
Incr Delay (d2), s/veh	4.5	0.0	0.7	22.1	0.2	0.4	5.3	0.0	0.0	1.5	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	0.0	0.5	0.1	0.2	0.2	0.2	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	0.0	9.7	35.0	9.7	9.9	17.4	0.0	0.0	13.0	0.0	12.5
LnGrp LOS	B	A	A	D	A	A	B	A	A	B	A	B
Approach Vol, veh/h		172			97			34			57	
Approach Delay, s/veh		11.1			10.3			17.4			12.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	5.6	4.6	9.6	6.2	5.6	8.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	11.5	37.5	24.5	16.5	32.5
Max Q Clear Time (g_c+I1), s	2.5	2.0	3.7	2.5	2.5	2.7
Green Ext Time (p_c), s	0.1	0.0	0.8	0.2	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	11.7
HCM 6th LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	180	33	35	443	415	125
Future Volume (veh/h)	180	33	35	443	415	125
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	196	36	38	482	451	136
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	293	261	80	1886	909	272
Arrive On Green	0.17	0.17	0.05	0.53	0.34	0.34
Sat Flow, veh/h	1767	1572	1767	3618	2767	800
Grp Volume(v), veh/h	196	36	38	482	296	291
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1712
Q Serve(g_s), s	3.1	0.6	0.6	2.2	4.0	4.1
Cycle Q Clear(g_c), s	3.1	0.6	0.6	2.2	4.0	4.1
Prop In Lane	1.00	1.00	1.00			0.47
Lane Grp Cap(c), veh/h	293	261	80	1886	599	582
V/C Ratio(X)	0.67	0.14	0.48	0.26	0.49	0.50
Avail Cap(c_a), veh/h	2379	2117	793	8263	3077	2987
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	11.8	10.7	14.0	3.8	7.9	7.9
Incr Delay (d2), s/veh	2.6	0.2	4.3	0.1	0.6	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	1.1	0.6	0.3	0.3	1.0	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.4	10.9	18.3	3.8	8.5	8.6
LnGrp LOS	B	B	B	A	A	A
Approach Vol, veh/h	232			520	587	
Approach Delay, s/veh	13.9			4.9	8.5	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		20.6		9.5	5.9	14.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		70.5		40.5	13.5	52.5
Max Q Clear Time (g_c+I1), s		4.2		5.1	2.6	6.1
Green Ext Time (p_c), s		3.7		0.7	0.0	4.2

Intersection Summary						
HCM 6th Ctrl Delay			8.0			
HCM 6th LOS			A			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	704	113	349	766	539	79	166	391	574	211	129
Future Volume (veh/h)	61	704	113	349	766	539	79	166	391	574	211	129
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	66	765	123	379	833	586	86	180	425	624	229	140
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	85	1307	406	476	1229	886	110	724	541	736	664	562
Arrive On Green	0.05	0.26	0.26	0.14	0.35	0.35	0.06	0.21	0.21	0.21	0.36	0.36
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	66	765	123	379	833	586	86	180	425	624	229	140
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	3.6	13.0	6.2	10.5	19.8	25.5	4.7	4.2	20.2	17.2	8.9	6.2
Cycle Q Clear(g_c), s	3.6	13.0	6.2	10.5	19.8	25.5	4.7	4.2	20.2	17.2	8.9	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	1307	406	476	1229	886	110	724	541	736	664	562
V/C Ratio(X)	0.78	0.59	0.30	0.80	0.68	0.66	0.78	0.25	0.78	0.85	0.35	0.25
Avail Cap(c_a), veh/h	181	1307	406	903	1462	990	225	724	541	1077	728	617
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	46.3	31.9	29.4	41.0	27.3	14.9	45.4	32.7	29.0	37.1	23.1	22.3
Incr Delay (d2), s/veh	13.9	0.7	0.4	3.1	1.0	1.4	11.2	0.2	7.5	4.4	0.3	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	1.9	5.3	2.4	4.6	8.3	8.8	2.4	1.8	9.9	7.5	3.9	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.2	32.6	29.8	44.1	28.3	16.4	56.6	32.9	36.4	41.4	23.5	22.5
LnGrp LOS	E	C	C	D	C	B	E	C	D	D	C	C
Approach Vol, veh/h		954			1798			691			993	
Approach Delay, s/veh		34.1			27.7			38.0			34.6	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.6	24.7	18.2	29.9	10.6	39.7	9.2	38.8
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	30.9	20.2	25.9	25.0	12.5	38.6	10.1	40.8
Max Q Clear Time (g_c+I1), s	19.2	22.2	12.5	15.0	6.7	10.9	5.6	27.5
Green Ext Time (p_c), s	1.9	0.0	1.1	4.0	0.1	1.8	0.0	6.8

Intersection Summary	
HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	6	4	88	4	113	0	384	56	161	417	7
Future Volume (veh/h)	7	6	4	88	4	113	0	384	56	161	417	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	8	7	4	96	4	123	0	417	61	175	453	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	185	121	46	373	12	215	5	588	86	238	1136	20
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.00	0.37	0.37	0.13	0.63	0.63
Sat Flow, veh/h	365	888	334	1361	87	1572	1767	1582	231	1767	1818	32
Grp Volume(v), veh/h	19	0	0	100	0	123	0	0	478	175	0	461
Grp Sat Flow(s),veh/h/ln	1586	0	0	1447	0	1572	1767	0	1814	1767	0	1850
Q Serve(g_s), s	0.0	0.0	0.0	1.8	0.0	2.8	0.0	0.0	8.5	3.6	0.0	4.7
Cycle Q Clear(g_c), s	2.2	0.0	0.0	2.3	0.0	2.8	0.0	0.0	8.5	3.6	0.0	4.7
Prop In Lane	0.42		0.21	0.96		1.00	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	352	0	0	384	0	215	5	0	674	238	0	1156
V/C Ratio(X)	0.05	0.00	0.00	0.26	0.00	0.57	0.00	0.00	0.71	0.74	0.00	0.40
Avail Cap(c_a), veh/h	1039	0	0	1030	0	937	234	0	2761	1240	0	3869
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.2	0.0	0.0	15.0	0.0	15.3	0.0	0.0	10.1	15.7	0.0	3.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	2.4	0.0	0.0	1.4	4.4	0.0	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	0.1	0.0	0.0	0.7	0.0	1.0	0.0	0.0	2.7	1.5	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	0.0	0.0	15.4	0.0	17.7	0.0	0.0	11.5	20.1	0.0	3.8
LnGrp LOS	B	A	A	B	A	B	A	A	B	C	A	A
Approach Vol, veh/h		19			223			478			636	
Approach Delay, s/veh		14.3			16.7			11.5			8.3	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	18.5		9.7	0.0	28.1		9.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	26.5	57.5		22.5	5.0	79.0		22.5
Max Q Clear Time (g_c+I1), s	5.6	10.5		4.2	0.0	6.7		4.8
Green Ext Time (p_c), s	0.5	3.5		0.0	0.0	3.4		0.8

Intersection Summary			
HCM 6th Ctrl Delay			10.9
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	222	5	30	207	6	1	0	10	2	0	0
Future Vol, veh/h	1	222	5	30	207	6	1	0	10	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	241	5	33	225	7	1	0	11	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	232	0	0	246	0	0	541	544	244	546	543	229
Stage 1	-	-	-	-	-	-	246	246	-	295	295	-
Stage 2	-	-	-	-	-	-	295	298	-	251	248	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1330	-	-	1314	-	-	450	445	792	447	445	808
Stage 1	-	-	-	-	-	-	756	701	-	711	667	-
Stage 2	-	-	-	-	-	-	711	665	-	751	699	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1330	-	-	1314	-	-	441	433	792	432	433	808
Mov Cap-2 Maneuver	-	-	-	-	-	-	441	433	-	432	433	-
Stage 1	-	-	-	-	-	-	755	700	-	710	650	-
Stage 2	-	-	-	-	-	-	693	648	-	740	698	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1	10	13.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	739	1330	-	-	1314	-	-	432
HCM Lane V/C Ratio	0.016	0.001	-	-	0.025	-	-	0.005
HCM Control Delay (s)	10	7.7	0	-	7.8	-	-	13.4
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0.1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	166	68	275	205	1	36	3	167	2	3	1
Future Volume (veh/h)	1	166	68	275	205	1	36	3	167	2	3	1
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	1	180	74	299	223	1	39	3	182	2	3	1
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	6	431	170	411	748	3	418	24	597	197	166	41
Arrive On Green	0.00	0.17	0.17	0.23	0.41	0.41	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1767	2466	976	1767	1846	8	1279	162	1572	260	1123	277
Grp Volume(v), veh/h	1	127	127	299	0	224	42	0	182	6	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1680	1767	0	1854	1441	0	1572	1660	0	0
Q Serve(g_s), s	0.0	1.9	2.0	4.7	0.0	2.5	0.6	0.0	2.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.9	2.0	4.7	0.0	2.5	0.7	0.0	2.5	0.1	0.0	0.0
Prop In Lane	1.00		0.58	1.00		0.00	0.93		1.00	0.33		0.17
Lane Grp Cap(c), veh/h	6	308	293	411	0	752	442	0	597	403	0	0
V/C Ratio(X)	0.17	0.41	0.43	0.73	0.00	0.30	0.10	0.00	0.30	0.01	0.00	0.00
Avail Cap(c_a), veh/h	438	1310	1248	2305	0	3336	1385	0	1637	1412	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	11.1	11.2	10.7	0.0	6.1	11.3	0.0	6.6	11.0	0.0	0.0
Incr Delay (d2), s/veh	13.3	0.9	1.0	2.5	0.0	0.2	0.1	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	0.0	0.6	0.6	1.6	0.0	0.6	0.2	0.0	0.5	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	12.0	12.2	13.2	0.0	6.3	11.4	0.0	6.9	11.1	0.0	0.0
LnGrp LOS	C	B	B	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		255			523			224			6	
Approach Delay, s/veh		12.2			10.3			7.7			11.1	
Approach LOS		B			B			A			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.0	11.5	9.8		9.0	4.5	16.8				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		24.5	39.5	22.5		24.5	7.5	54.5				
Max Q Clear Time (g_c+I1), s		4.5	6.7	4.0		2.1	2.0	4.5				
Green Ext Time (p_c), s		0.8	0.9	1.3		0.0	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay			10.2									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	269	56	270	484	149	43	63	201	177	79	54
Future Volume (veh/h)	28	269	56	270	484	149	43	63	201	177	79	54
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	292	61	293	526	162	47	68	218	192	86	59
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	60	719	321	463	810	248	84	598	479	253	935	417
Arrive On Green	0.03	0.20	0.20	0.14	0.30	0.30	0.05	0.17	0.17	0.14	0.27	0.27
Sat Flow, veh/h	1767	3526	1572	3428	2657	815	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	30	292	61	293	348	340	47	68	218	192	86	59
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1709	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	0.9	3.7	1.7	4.2	8.8	8.9	1.3	0.8	5.8	5.4	0.9	1.5
Cycle Q Clear(g_c), s	0.9	3.7	1.7	4.2	8.8	8.9	1.3	0.8	5.8	5.4	0.9	1.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	719	321	463	538	521	84	598	479	253	935	417
V/C Ratio(X)	0.50	0.41	0.19	0.63	0.65	0.65	0.56	0.11	0.46	0.76	0.09	0.14
Avail Cap(c_a), veh/h	291	1876	837	1493	1416	1373	428	1603	927	975	2695	1202
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	24.5	17.9	17.0	21.1	15.6	15.6	24.1	18.2	14.5	21.3	14.3	14.5
Incr Delay (d2), s/veh	6.4	0.4	0.3	1.4	1.3	1.4	5.7	0.1	0.7	4.6	0.0	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	1.4	0.6	1.6	3.3	3.2	0.7	0.3	1.9	2.4	0.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	18.2	17.3	22.6	16.9	17.0	29.8	18.2	15.2	25.9	14.3	14.6
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		383			981			333			337	
Approach Delay, s/veh		19.1			18.6			17.9			21.0	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	13.3	11.5	15.0	7.0	18.2	6.2	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	28.5	23.5	22.5	27.5	12.5	39.5	8.5	41.5
Max Q Clear Time (g_c+I1), s	7.4	7.8	6.2	5.7	3.3	3.5	2.9	10.9
Green Ext Time (p_c), s	0.5	1.0	0.9	2.0	0.0	0.7	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	459	215	257	435	0	0	0	0	464	151	504
Future Volume (veh/h)	0	459	215	257	435	0	0	0	0	464	151	504
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	499	234	279	473	0				334	402	483
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	836	373	424	1545	0				719	755	640
Arrive On Green	0.00	0.24	0.24	0.12	0.44	0.00				0.41	0.41	0.41
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	499	234	279	473	0				334	402	483
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	7.3	7.7	4.5	5.1	0.0				8.0	9.5	15.3
Cycle Q Clear(g_c), s	0.0	7.3	7.7	4.5	5.1	0.0				8.0	9.5	15.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	836	373	424	1545	0				719	755	640
V/C Ratio(X)	0.00	0.60	0.63	0.66	0.31	0.00				0.46	0.53	0.75
Avail Cap(c_a), veh/h	0	1729	771	1092	3125	0				1810	1900	1610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	19.7	19.9	24.3	10.6	0.0				12.6	13.0	14.8
Incr Delay (d2), s/veh	0.0	0.7	1.7	1.8	0.1	0.0				0.5	0.6	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
%ile BackOfQ(50%),veh/ln	0.0	2.8	2.8	1.8	1.7	0.0				2.8	3.6	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	20.4	21.6	26.0	10.7	0.0				13.1	13.6	16.6
LnGrp LOS	A	C	C	C	B	A				B	B	B
Approach Vol, veh/h		733			752						1219	
Approach Delay, s/veh		20.8			16.4						14.7	
Approach LOS		C			B						B	

Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			11.7	18.3		28.1		30.0				
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s			18.5	28.5		59.5		51.5				
Max Q Clear Time (g_c+I1), s			6.5	9.7		17.3		7.1				
Green Ext Time (p_c), s			0.7	4.0		6.4		3.6				

Intersection Summary			
HCM 6th Ctrl Delay			16.8
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	375	532	294	496	85	205	92	219	80	95	19
Future Volume (veh/h)	9	375	532	294	496	85	205	92	219	80	95	19
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	10	408	578	320	539	92	223	100	238	87	103	21
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	22	1622	755	458	1330	226	282	373	526	113	157	32
Arrive On Green	0.01	0.32	0.32	0.13	0.44	0.44	0.16	0.20	0.20	0.06	0.11	0.11
Sat Flow, veh/h	1767	5066	1572	3428	3014	513	1767	1856	1572	1767	1496	305
Grp Volume(v), veh/h	10	408	578	320	314	317	223	100	238	87	0	124
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1763	1767	1856	1572	1767	0	1801
Q Serve(g_s), s	0.4	3.8	19.4	5.7	7.8	7.8	7.8	2.9	7.6	3.1	0.0	4.2
Cycle Q Clear(g_c), s	0.4	3.8	19.4	5.7	7.8	7.8	7.8	2.9	7.6	3.1	0.0	4.2
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	22	1622	755	458	778	778	282	373	526	113	0	189
V/C Ratio(X)	0.44	0.25	0.77	0.70	0.40	0.41	0.79	0.27	0.45	0.77	0.00	0.65
Avail Cap(c_a), veh/h	152	1622	755	1044	950	950	1118	1406	1402	373	0	605
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	0.00	1.00
Uniform Delay (d), s/veh	31.4	16.1	13.7	26.5	12.2	12.2	25.9	21.6	16.7	29.5	0.0	27.5
Incr Delay (d2), s/veh	13.2	0.1	4.7	1.9	0.3	0.3	4.9	0.4	0.6	10.4	0.0	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	0.2	1.4	6.8	2.3	2.8	2.8	3.5	1.2	2.6	1.6	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.5	16.2	18.4	28.4	12.5	12.5	30.8	22.0	17.3	39.9	0.0	31.3
LnGrp LOS	D	B	B	C	B	B	C	C	B	D	A	C
Approach Vol, veh/h		996			951			561			211	
Approach Delay, s/veh		17.8			17.9			23.5			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	8.6	17.4	13.1	25.0	14.7	11.2	5.3	32.7
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	13.5	48.5	19.5	20.5	40.5	21.5	5.5	34.5
Max Q Clear Time (g_c+I1), s	5.1	9.6	7.7	21.4	9.8	6.2	2.4	9.8
Green Ext Time (p_c), s	0.1	1.4	0.9	0.0	0.7	0.5	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	20.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	311	2	51	0	0	0	96	215	3	11	504	399
Future Volume (veh/h)	311	2	51	0	0	0	96	215	3	11	504	399
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	339	0	55	0	0	0	104	234	3	12	548	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	651	0	290	0	6	0	165	1386	18	28	1098	
Arrive On Green	0.18	0.00	0.18	0.00	0.00	0.00	0.09	0.39	0.39	0.02	0.31	0.00
Sat Flow, veh/h	3534	0	1572	0	1856	0	1767	3564	46	1767	3526	1572
Grp Volume(v), veh/h	339	0	55	0	0	0	104	116	121	12	548	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	1856	0	1767	1763	1847	1767	1763	1572
Q Serve(g_s), s	2.8	0.0	1.0	0.0	0.0	0.0	1.9	1.4	1.4	0.2	4.2	0.0
Cycle Q Clear(g_c), s	2.8	0.0	1.0	0.0	0.0	0.0	1.9	1.4	1.4	0.2	4.2	0.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	651	0	290	0	6	0	165	686	718	28	1098	
V/C Ratio(X)	0.52	0.00	0.19	0.00	0.00	0.00	0.63	0.17	0.17	0.43	0.50	
Avail Cap(c_a), veh/h	3068	0	1365	0	1017	0	996	2631	2757	350	3973	
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.1	0.0	11.3	0.0	0.0	0.0	14.3	6.6	6.6	16.0	9.2	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.3	0.0	0.0	0.0	3.9	0.1	0.1	10.1	0.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.3	0.0	0.0	0.0	0.8	0.4	0.4	0.2	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	0.0	11.6	0.0	0.0	0.0	18.3	6.7	6.7	26.1	9.6	0.0
LnGrp LOS	B	A	B	A	A	A	B	A	A	C	A	
Approach Vol, veh/h		394			0			341			560	A
Approach Delay, s/veh		12.6			0.0			10.2			9.9	
Approach LOS		B						B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	17.3		10.5	7.6	14.7		0.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	6.5	49.0		28.5	18.5	37.0		18.0
Max Q Clear Time (g_c+I1), s	2.2	3.4		4.8	3.9	6.2		0.0
Green Ext Time (p_c), s	0.0	1.5		1.4	0.2	4.1		0.0

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	85	107	17	0	76
Future Vol, veh/h	0	85	107	17	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	92	116	18	0	83

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	116
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	934
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	934
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	934
HCM Lane V/C Ratio	-	-	-	0.088
HCM Control Delay (s)	-	-	-	9.2
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	68	8	10	94	51	3	0	4	38	1	11
Future Volume (veh/h)	36	68	8	10	94	51	3	0	4	38	1	11
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	39	74	9	11	102	55	3	0	4	41	1	12
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	320	39	26	305	259	7	0	9	108	3	98
Arrive On Green	0.05	0.20	0.20	0.01	0.16	0.16	0.01	0.00	0.01	0.06	0.06	0.06
Sat Flow, veh/h	1767	1623	197	1767	1856	1572	707	0	943	1727	42	1572
Grp Volume(v), veh/h	39	0	83	11	102	55	7	0	0	42	0	12
Grp Sat Flow(s),veh/h/ln	1767	0	1820	1767	1856	1572	1650	0	0	1769	0	1572
Q Serve(g_s), s	0.5	0.0	1.0	0.2	1.2	0.8	0.1	0.0	0.0	0.6	0.0	0.2
Cycle Q Clear(g_c), s	0.5	0.0	1.0	0.2	1.2	0.8	0.1	0.0	0.0	0.6	0.0	0.2
Prop In Lane	1.00		0.11	1.00		1.00	0.43		0.57	0.98		1.00
Lane Grp Cap(c), veh/h	84	0	359	26	305	259	16	0	0	111	0	98
V/C Ratio(X)	0.47	0.00	0.23	0.42	0.33	0.21	0.45	0.00	0.00	0.38	0.00	0.12
Avail Cap(c_a), veh/h	1301	0	2933	879	2547	2158	1477	0	0	1865	0	1658
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.7	0.0	8.5	12.3	9.3	9.1	12.4	0.0	0.0	11.3	0.0	11.1
Incr Delay (d2), s/veh	4.0	0.0	0.3	10.6	0.6	0.4	18.7	0.0	0.0	2.1	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	0.2	0.0	0.3	0.1	0.4	0.2	0.1	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	0.0	8.8	22.8	9.9	9.5	31.1	0.0	0.0	13.5	0.0	11.7
LnGrp LOS	B	A	A	C	A	A	C	A	A	B	A	B
Approach Vol, veh/h		122			168			7			54	
Approach Delay, s/veh		11.0			10.6			31.1			13.1	
Approach LOS		B			B			C			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		4.7	4.9	9.5		6.1	5.7	8.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	12.5	40.5		26.5	18.5	34.5				
Max Q Clear Time (g_c+I1), s		2.1	2.2	3.0		2.6	2.5	3.2				
Green Ext Time (p_c), s		0.0	0.0	0.4		0.2	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			11.5									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	25	40	167	177	133
Future Volume (veh/h)	100	25	40	167	177	133
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	109	27	43	182	192	145
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	196	92	1753	502	359
Arrive On Green	0.12	0.12	0.05	0.50	0.26	0.26
Sat Flow, veh/h	1767	1572	1767	3618	2054	1404
Grp Volume(v), veh/h	109	27	43	182	171	166
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1603
Q Serve(g_s), s	1.4	0.4	0.6	0.7	1.9	2.0
Cycle Q Clear(g_c), s	1.4	0.4	0.6	0.7	1.9	2.0
Prop In Lane	1.00	1.00	1.00			0.88
Lane Grp Cap(c), veh/h	220	196	92	1753	451	410
V/C Ratio(X)	0.49	0.14	0.47	0.10	0.38	0.40
Avail Cap(c_a), veh/h	2934	2611	1523	10595	3445	3133
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	9.3	11.0	3.2	7.3	7.3
Incr Delay (d2), s/veh	1.7	0.3	3.7	0.0	0.5	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	0.4	0.4	0.2	0.0	0.5	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.4	9.6	14.6	3.2	7.8	8.0
LnGrp LOS	B	A	B	A	A	A
Approach Vol, veh/h	136			225	337	
Approach Delay, s/veh	11.1			5.4	7.9	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		16.3		7.5	5.7	10.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		71.5		39.5	20.5	46.5
Max Q Clear Time (g_c+I1), s		2.7		3.4	2.6	4.0
Green Ext Time (p_c), s		1.3		0.4	0.1	2.3

Intersection Summary			
HCM 6th Ctrl Delay			7.7
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	487	43	259	446	323	55	77	186	280	87	61
Future Volume (veh/h)	59	487	43	259	446	323	55	77	186	280	87	61
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	529	47	282	485	351	60	84	202	304	95	66
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	1119	347	449	1036	682	98	574	462	479	458	388
Arrive On Green	0.06	0.22	0.22	0.13	0.29	0.29	0.06	0.16	0.16	0.14	0.25	0.25
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	64	529	47	282	485	351	60	84	202	304	95	66
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	1.8	4.7	1.2	4.1	5.9	8.5	1.7	1.1	5.4	4.4	2.1	1.7
Cycle Q Clear(g_c), s	1.8	4.7	1.2	4.1	5.9	8.5	1.7	1.1	5.4	4.4	2.1	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	102	1119	347	449	1036	682	98	574	462	479	458	388
V/C Ratio(X)	0.62	0.47	0.14	0.63	0.47	0.51	0.61	0.15	0.44	0.63	0.21	0.17
Avail Cap(c_a), veh/h	492	2675	830	1547	2471	1322	492	1659	946	1745	1301	1102
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	24.0	17.6	16.3	21.4	15.1	10.8	24.0	18.7	14.9	21.1	15.6	15.4
Incr Delay (d2), s/veh	6.1	0.3	0.2	1.4	0.3	0.6	6.0	0.1	0.7	1.4	0.2	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	0.9	1.7	0.4	1.6	2.1	2.5	0.8	0.4	1.8	1.7	0.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.1	18.0	16.5	22.9	15.4	11.4	30.0	18.8	15.6	22.5	15.8	15.6
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		640			1118			346			465	
Approach Delay, s/veh		19.1			16.0			18.8			20.2	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	13.0	11.3	16.0	7.4	17.3	7.5	19.8
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	26.5	24.5	23.5	27.5	14.5	36.5	14.5	36.5
Max Q Clear Time (g_c+I1), s	6.4	7.4	6.1	6.7	3.7	4.1	3.8	10.5
Green Ext Time (p_c), s	1.0	1.1	0.9	3.7	0.1	0.7	0.1	4.8

Intersection Summary	
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Stony Point Road & Wilfred Avenue

Baseline +Project PM
09/07/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1	3	72	8	216	10	510	92	203	553	3
Future Volume (veh/h)	10	1	3	72	8	216	10	510	92	203	553	3
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	1	3	78	9	235	11	554	100	221	601	3
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	232	29	40	359	36	296	25	669	121	279	1073	5
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.01	0.44	0.44	0.16	0.58	0.58
Sat Flow, veh/h	702	152	214	1325	189	1572	1767	1530	276	1767	1845	9
Grp Volume(v), veh/h	15	0	0	87	0	235	11	0	654	221	0	604
Grp Sat Flow(s),veh/h/ln	1068	0	0	1515	0	1572	1767	0	1806	1767	0	1854
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	8.9	0.4	0.0	19.9	7.5	0.0	12.6
Cycle Q Clear(g_c), s	2.6	0.0	0.0	2.6	0.0	8.9	0.4	0.0	19.9	7.5	0.0	12.6
Prop In Lane	0.73		0.20	0.90		1.00	1.00		0.15	1.00		0.00
Lane Grp Cap(c), veh/h	301	0	0	395	0	296	25	0	790	279	0	1078
V/C Ratio(X)	0.05	0.00	0.00	0.22	0.00	0.79	0.45	0.00	0.83	0.79	0.00	0.56
Avail Cap(c_a), veh/h	473	0	0	596	0	517	144	0	1751	722	0	2403
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	0.0	0.0	21.6	0.0	24.2	30.5	0.0	15.5	25.3	0.0	8.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	4.8	12.2	0.0	2.3	5.1	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	0.2	0.0	0.0	1.1	0.0	3.5	0.2	0.0	7.5	3.4	0.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	0.0	21.9	0.0	29.0	42.7	0.0	17.8	30.4	0.0	8.6
LnGrp LOS	C	A	A	C	A	C	D	A	B	C	A	A
Approach Vol, veh/h		15			322			665			825	
Approach Delay, s/veh		20.8			27.1			18.2			14.4	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.3	31.8		16.3	5.4	40.8		16.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	25.5	60.5		20.5	5.1	80.9		20.5				
Max Q Clear Time (g_c+I1), s	9.5	21.9		4.6	2.4	14.6		10.9				
Green Ext Time (p_c), s	0.5	5.4		0.0	0.0	4.8		0.9				

Intersection Summary			
HCM 6th Ctrl Delay			18.1
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	329	4	24	304	6	10	1	34	4	0	1
Future Vol, veh/h	0	329	4	24	304	6	10	1	34	4	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	358	4	26	330	7	11	1	37	4	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	337	0	0	362	0	0	746	749	360	765	748	334
Stage 1	-	-	-	-	-	-	360	360	-	386	386	-
Stage 2	-	-	-	-	-	-	386	389	-	379	362	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1217	-	-	1191	-	-	328	339	682	319	340	706
Stage 1	-	-	-	-	-	-	656	625	-	635	608	-
Stage 2	-	-	-	-	-	-	635	607	-	641	623	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1217	-	-	1191	-	-	322	332	682	296	333	706
Mov Cap-2 Maneuver	-	-	-	-	-	-	322	332	-	296	333	-
Stage 1	-	-	-	-	-	-	656	625	-	635	595	-
Stage 2	-	-	-	-	-	-	620	594	-	605	623	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	12.4	15.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	536	1217	-	-	1191	-	-	335
HCM Lane V/C Ratio	0.091	-	-	-	0.022	-	-	0.016
HCM Control Delay (s)	12.4	0	-	-	8.1	-	-	15.9
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	226	120	491	206	1	126	9	456	4	7	2
Future Volume (veh/h)	3	226	120	491	206	1	126	9	456	4	7	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	3	246	130	534	224	1	137	10	496	4	8	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	7	378	193	615	944	4	471	30	945	149	260	55
Arrive On Green	0.00	0.17	0.17	0.35	0.51	0.51	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1767	2257	1154	1767	1846	8	1388	120	1572	273	1028	217
Grp Volume(v), veh/h	3	190	186	534	0	225	147	0	496	14	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1648	1767	0	1854	1507	0	1572	1518	0	0
Q Serve(g_s), s	0.1	5.9	6.2	16.5	0.0	3.9	0.3	0.0	10.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	5.9	6.2	16.5	0.0	3.9	4.0	0.0	10.7	0.3	0.0	0.0
Prop In Lane	1.00		0.70	1.00		0.00	0.93		1.00	0.29		0.14
Lane Grp Cap(c), veh/h	7	295	276	615	0	948	501	0	945	464	0	0
V/C Ratio(X)	0.42	0.64	0.67	0.87	0.00	0.24	0.29	0.00	0.52	0.03	0.00	0.00
Avail Cap(c_a), veh/h	155	559	523	1379	0	1872	689	0	1153	647	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.0	22.7	22.8	17.8	0.0	7.9	17.7	0.0	6.8	16.4	0.0	0.0
Incr Delay (d2), s/veh	34.3	2.3	2.8	3.9	0.0	0.1	0.3	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	0.1	2.5	2.4	6.5	0.0	1.3	1.5	0.0	2.7	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	25.0	25.6	21.7	0.0	8.1	18.1	0.0	7.2	16.4	0.0	0.0
LnGrp LOS	E	C	C	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		379			759			643			14	
Approach Delay, s/veh		25.6			17.7			9.7			16.4	
Approach LOS		C			B			A			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.3	24.8	14.3		19.3	4.7	34.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	45.5	18.5		22.5	5.1	58.9				
Max Q Clear Time (g_c+I1), s		12.7	18.5	8.2		2.3	2.1	5.9				
Green Ext Time (p_c), s		2.0	1.8	1.6		0.0	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay			16.5									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	579	150	477	587	206	88	158	486	164	142	49
Future Volume (veh/h)	48	579	150	477	587	206	88	158	486	164	142	49
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	52	629	163	518	638	224	96	172	528	178	154	53
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	74	841	375	651	989	347	124	821	665	219	1011	451
Arrive On Green	0.04	0.24	0.24	0.19	0.39	0.39	0.07	0.23	0.23	0.12	0.29	0.29
Sat Flow, veh/h	1767	3526	1572	3428	2559	898	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	52	629	163	518	439	423	96	172	528	178	154	53
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1694	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	2.4	13.8	7.4	12.1	17.1	17.1	4.5	3.3	19.5	8.2	2.7	2.1
Cycle Q Clear(g_c), s	2.4	13.8	7.4	12.1	17.1	17.1	4.5	3.3	19.5	8.2	2.7	2.1
Prop In Lane	1.00		1.00	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	74	841	375	651	681	654	124	821	665	219	1011	451
V/C Ratio(X)	0.70	0.75	0.43	0.80	0.65	0.65	0.77	0.21	0.79	0.81	0.15	0.12
Avail Cap(c_a), veh/h	194	1242	554	1331	1111	1068	279	821	665	433	1128	503
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	39.6	29.6	27.1	32.4	21.0	21.0	38.3	25.9	21.0	35.7	22.3	22.0
Incr Delay (d2), s/veh	11.4	1.4	0.8	2.3	1.0	1.1	9.9	0.1	6.6	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	1.3	5.8	2.8	5.1	6.9	6.6	2.2	1.4	9.6	3.9	1.1	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.0	31.0	27.9	34.7	22.0	22.1	48.1	26.0	27.6	42.8	22.3	22.2
LnGrp LOS	D	C	C	C	C	C	D	C	C	D	C	C
Approach Vol, veh/h		844			1380			796			385	
Approach Delay, s/veh		31.6			26.8			29.8			31.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	24.0	20.4	24.5	10.4	28.5	8.0	36.9
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	20.5	19.5	32.5	29.5	13.2	26.8	9.2	52.8
Max Q Clear Time (g_c+I1), s	10.2	21.5	14.1	15.8	6.5	4.7	4.4	19.1
Green Ext Time (p_c), s	0.3	0.0	1.8	4.1	0.1	1.1	0.0	6.6

Intersection Summary	
HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	889	327	158	645	0	0	0	0	501	185	677
Future Volume (veh/h)	0	889	327	158	645	0	0	0	0	501	185	677
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	966	355	172	701	0				373	442	671
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1152	514	236	1548	0				838	880	746
Arrive On Green	0.00	0.33	0.33	0.07	0.44	0.00				0.47	0.47	0.47
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	966	355	172	701	0				373	442	671
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	26.4	20.4	5.1	14.5	0.0				14.6	17.1	40.6
Cycle Q Clear(g_c), s	0.0	26.4	20.4	5.1	14.5	0.0				14.6	17.1	40.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1152	514	236	1548	0				838	880	746
V/C Ratio(X)	0.00	0.84	0.69	0.73	0.45	0.00				0.45	0.50	0.90
Avail Cap(c_a), veh/h	0	1301	580	294	1756	0				1010	1060	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	32.4	30.4	47.4	20.4	0.0				18.2	18.8	25.0
Incr Delay (d2), s/veh	0.0	4.6	3.0	6.8	0.2	0.0				0.4	0.4	10.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.7	8.0	2.4	5.9	0.0				5.9	7.2	16.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	36.9	33.4	54.2	20.6	0.0				18.5	19.3	35.6
LnGrp LOS	A	D	C	D	C	A				B	B	D
Approach Vol, veh/h		1321			873						1486	
Approach Delay, s/veh		36.0			27.2						26.5	
Approach LOS		D			C						C	

Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			11.6	38.4		53.7		50.1				
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s			8.9	38.3		59.3		51.7				
Max Q Clear Time (g_c+I1), s			7.1	28.4		42.6		16.5				
Green Ext Time (p_c), s			0.1	5.5		6.6		5.6				

Intersection Summary		
HCM 6th Ctrl Delay		30.1
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	692	653	250	403	63	375	157	480	176	187	22
Future Volume (veh/h)	11	692	653	250	403	63	375	157	480	176	187	22
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	752	710	272	438	68	408	171	522	191	203	24
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	1196	776	363	1003	155	455	612	685	230	331	39
Arrive On Green	0.01	0.24	0.24	0.11	0.33	0.33	0.26	0.33	0.33	0.13	0.20	0.20
Sat Flow, veh/h	1767	5066	1572	3428	3061	472	1767	1856	1572	1767	1628	193
Grp Volume(v), veh/h	12	752	710	272	251	255	408	171	522	191	0	227
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1771	1767	1856	1572	1767	0	1821
Q Serve(g_s), s	0.6	12.1	21.5	7.0	10.2	10.3	20.3	6.2	25.5	9.6	0.0	10.3
Cycle Q Clear(g_c), s	0.6	12.1	21.5	7.0	10.2	10.3	20.3	6.2	25.5	9.6	0.0	10.3
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	25	1196	776	363	578	580	455	612	685	230	0	370
V/C Ratio(X)	0.47	0.63	0.92	0.75	0.43	0.44	0.90	0.28	0.76	0.83	0.00	0.61
Avail Cap(c_a), veh/h	97	1196	776	696	678	680	708	815	857	427	0	510
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	0.00	1.00
Uniform Delay (d), s/veh	44.5	31.2	21.3	39.5	24.0	24.0	32.7	22.5	21.7	38.6	0.0	33.0
Incr Delay (d2), s/veh	13.0	1.1	15.5	3.1	0.5	0.5	9.6	0.2	3.2	7.5	0.0	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	0.4	5.0	16.2	3.1	4.2	4.3	9.7	2.7	9.5	4.6	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.5	32.3	36.8	42.6	24.5	24.6	42.3	22.8	24.8	46.1	0.0	34.7
LnGrp LOS	E	C	D	D	C	C	D	C	C	D	A	C
Approach Vol, veh/h		1474			778			1101			418	
Approach Delay, s/veh		34.6			30.9			31.0			39.9	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	34.5	14.1	26.0	27.9	23.0	5.8	34.3
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	22.0	40.0	18.5	21.5	36.5	25.5	5.0	35.0
Max Q Clear Time (g_c+I1), s	11.6	27.5	9.0	23.5	22.3	12.3	2.6	12.3
Green Ext Time (p_c), s	0.4	2.5	0.6	0.0	1.1	1.0	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	554	0	32	0	0	1	262	467	4	6	405	656
Future Volume (veh/h)	554	0	32	0	0	1	262	467	4	6	405	656
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	602	0	35	0	0	1	285	508	4	7	440	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	842	0	375	0	0	3	358	1445	11	16	739	
Arrive On Green	0.24	0.00	0.24	0.00	0.00	0.00	0.20	0.40	0.40	0.01	0.21	0.00
Sat Flow, veh/h	3534	0	1572	0	0	1572	1767	3585	28	1767	3526	1572
Grp Volume(v), veh/h	602	0	35	0	0	1	285	250	262	7	440	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	0	1573	1767	1763	1850	1767	1763	1572
Q Serve(g_s), s	8.1	0.0	0.9	0.0	0.0	0.0	7.9	5.1	5.1	0.2	5.8	0.0
Cycle Q Clear(g_c), s	8.1	0.0	0.9	0.0	0.0	0.0	7.9	5.1	5.1	0.2	5.8	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	842	0	375	0	0	3	358	710	746	16	739	
V/C Ratio(X)	0.72	0.00	0.09	0.00	0.00	0.33	0.80	0.35	0.35	0.43	0.60	
Avail Cap(c_a), veh/h	1839	0	818	0	0	547	837	1776	1865	171	2223	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.1	0.0	15.3	0.0	0.0	25.8	19.6	10.7	10.7	25.5	18.4	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.1	0.0	0.0	53.3	4.1	0.3	0.3	16.7	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	3.1	0.0	0.3	0.0	0.0	0.1	3.3	1.7	1.8	0.2	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	0.0	15.5	0.0	0.0	79.0	23.7	11.0	11.0	42.2	19.2	0.0
LnGrp LOS	B	A	B	A	A	E	C	B	B	D	B	
Approach Vol, veh/h		637			1			797			447	A
Approach Delay, s/veh		19.0			79.0			15.5			19.6	
Approach LOS		B			E			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	25.3		16.8	15.0	15.3		4.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	52.1		26.9	24.5	32.6		18.0				
Max Q Clear Time (g_c+I1), s	2.2	7.1		10.1	9.9	7.8		2.0				
Green Ext Time (p_c), s	0.0	3.4		2.2	0.7	3.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			17.7
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	185	54	22	0	98
Future Vol, veh/h	0	185	54	22	0	98
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	201	59	24	0	107

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	59
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	1004
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	1004
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1004
HCM Lane V/C Ratio	-	-	-	0.106
HCM Control Delay (s)	-	-	-	9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	124	4	2	56	85	10	3	18	83	1	20
Future Volume (veh/h)	61	124	4	2	56	85	10	3	18	83	1	20
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	66	135	4	2	61	92	11	3	20	90	1	22
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	126	405	12	6	292	247	22	6	40	181	2	163
Arrive On Green	0.07	0.23	0.23	0.00	0.16	0.16	0.04	0.04	0.04	0.10	0.10	0.10
Sat Flow, veh/h	1767	1793	53	1767	1856	1572	535	146	973	1749	19	1572
Grp Volume(v), veh/h	66	0	139	2	61	92	34	0	0	91	0	22
Grp Sat Flow(s),veh/h/ln	1767	0	1846	1767	1856	1572	1654	0	0	1768	0	1572
Q Serve(g_s), s	1.0	0.0	1.8	0.0	0.8	1.5	0.6	0.0	0.0	1.4	0.0	0.4
Cycle Q Clear(g_c), s	1.0	0.0	1.8	0.0	0.8	1.5	0.6	0.0	0.0	1.4	0.0	0.4
Prop In Lane	1.00		0.03	1.00		1.00	0.32		0.59	0.99		1.00
Lane Grp Cap(c), veh/h	126	0	417	6	292	247	68	0	0	183	0	163
V/C Ratio(X)	0.52	0.00	0.33	0.33	0.21	0.37	0.50	0.00	0.00	0.50	0.00	0.14
Avail Cap(c_a), veh/h	1261	0	2410	584	1712	1451	1525	0	0	1754	0	1560
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.9	0.0	9.3	14.3	10.5	10.8	13.5	0.0	0.0	12.2	0.0	11.7
Incr Delay (d2), s/veh	3.3	0.0	0.5	27.9	0.4	0.9	5.5	0.0	0.0	2.1	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	0.4	0.0	0.5	0.1	0.3	0.4	0.3	0.0	0.0	0.5	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	0.0	9.8	42.2	10.9	11.8	19.0	0.0	0.0	14.3	0.0	12.1
LnGrp LOS	B	A	A	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		205			155			34			113	
Approach Delay, s/veh		11.8			11.8			19.0			13.8	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		5.7	4.6	11.0		7.5	6.5	9.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		26.5	9.5	37.5		28.5	20.5	26.5				
Max Q Clear Time (g_c+I1), s		2.6	2.0	3.8		3.4	3.0	3.5				
Green Ext Time (p_c), s		0.1	0.0	0.8		0.5	0.1	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			12.8									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	197	68	74	443	415	140
Future Volume (veh/h)	197	68	74	443	415	140
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	214	74	80	482	451	152
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	327	291	139	1920	858	287
Arrive On Green	0.19	0.19	0.08	0.54	0.33	0.33
Sat Flow, veh/h	1767	1572	1767	3618	2688	867
Grp Volume(v), veh/h	214	74	80	482	305	298
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1699
Q Serve(g_s), s	3.7	1.3	1.5	2.4	4.7	4.7
Cycle Q Clear(g_c), s	3.7	1.3	1.5	2.4	4.7	4.7
Prop In Lane	1.00	1.00	1.00			0.51
Lane Grp Cap(c), veh/h	327	291	139	1920	583	562
V/C Ratio(X)	0.65	0.25	0.58	0.25	0.52	0.53
Avail Cap(c_a), veh/h	2044	1819	1088	7679	2515	2425
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	11.6	14.8	4.0	9.0	9.0
Incr Delay (d2), s/veh	2.2	0.5	3.7	0.1	0.7	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	1.3	1.3	0.6	0.4	1.3	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.8	12.1	18.5	4.1	9.7	9.8
LnGrp LOS	B	B	B	A	A	A
Approach Vol, veh/h	288			562	603	
Approach Delay, s/veh	14.1			6.1	9.8	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		22.6		10.7	7.1	15.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		72.5		38.5	20.5	47.5
Max Q Clear Time (g_c+I1), s		4.4		5.7	3.5	6.7
Green Ext Time (p_c), s		3.7		0.9	0.1	4.3

Intersection Summary			
HCM 6th Ctrl Delay			9.2
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	747	121	349	790	574	86	170	391	603	217	129
Future Volume (veh/h)	61	747	121	349	790	574	86	170	391	603	217	129
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	66	812	132	379	859	624	93	185	425	655	236	140
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	85	1365	424	473	1267	917	119	666	514	767	641	543
Arrive On Green	0.05	0.27	0.27	0.14	0.36	0.36	0.07	0.19	0.19	0.22	0.35	0.35
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	66	812	132	379	859	624	93	185	425	655	236	140
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	3.7	14.0	6.7	10.7	20.7	27.4	5.2	4.5	18.9	18.4	9.5	6.4
Cycle Q Clear(g_c), s	3.7	14.0	6.7	10.7	20.7	27.4	5.2	4.5	18.9	18.4	9.5	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	1365	424	473	1267	917	119	666	514	767	641	543
V/C Ratio(X)	0.78	0.59	0.31	0.80	0.68	0.68	0.78	0.28	0.83	0.85	0.37	0.26
Avail Cap(c_a), veh/h	177	1365	424	860	1451	999	230	666	514	1093	701	594
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	47.1	31.8	29.1	41.8	27.1	14.4	46.0	34.8	31.1	37.3	24.6	23.5
Incr Delay (d2), s/veh	13.9	0.7	0.4	3.2	1.1	1.7	10.7	0.2	10.7	4.8	0.4	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	1.9	5.7	2.6	4.7	8.7	9.4	2.6	1.9	10.7	8.1	4.2	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	32.5	29.6	45.0	28.2	16.1	56.6	35.0	41.8	42.1	24.9	23.8
LnGrp LOS	E	C	C	D	C	B	E	C	D	D	C	C
Approach Vol, veh/h		1010			1862			703			1031	
Approach Delay, s/veh		34.0			27.6			41.9			35.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.9	23.4	18.3	31.5	11.2	39.1	9.3	40.5
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	31.9	18.9	25.1	26.1	13.0	37.8	10.0	41.2
Max Q Clear Time (g_c+I1), s	20.4	20.9	12.7	16.0	7.2	11.5	5.7	29.4
Green Ext Time (p_c), s	2.0	0.0	1.1	4.3	0.1	1.9	0.0	6.5

Intersection Summary	
HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	7	5	104	5	123	0	476	63	180	517	9
Future Volume (veh/h)	9	7	5	104	5	123	0	476	63	180	517	9
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	10	8	5	113	5	134	0	517	68	196	562	10
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	107	44	361	11	220	4	674	89	260	1208	21
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.00	0.42	0.42	0.15	0.66	0.66
Sat Flow, veh/h	361	763	312	1488	78	1572	1767	1606	211	1767	1817	32
Grp Volume(v), veh/h	23	0	0	118	0	134	0	0	585	196	0	572
Grp Sat Flow(s),veh/h/ln	1436	0	0	1566	0	1572	1767	0	1818	1767	0	1850
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	12.7	4.9	0.0	6.9
Cycle Q Clear(g_c), s	2.8	0.0	0.0	2.8	0.0	3.7	0.0	0.0	12.7	4.9	0.0	6.9
Prop In Lane	0.43		0.22	0.96		1.00	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	313	0	0	372	0	220	4	0	762	260	0	1229
V/C Ratio(X)	0.07	0.00	0.00	0.32	0.00	0.61	0.00	0.00	0.77	0.75	0.00	0.47
Avail Cap(c_a), veh/h	829	0	0	862	0	769	192	0	2349	940	0	3174
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	18.2	0.0	18.6	0.0	0.0	11.4	18.8	0.0	3.8
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	2.7	0.0	0.0	1.7	4.4	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	0.2	0.0	0.0	1.1	0.0	1.3	0.0	0.0	4.3	2.1	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	0.0	0.0	18.7	0.0	21.3	0.0	0.0	13.1	23.2	0.0	4.0
LnGrp LOS	B	A	A	B	A	C	A	A	B	C	A	A
Approach Vol, veh/h		23			252			585			768	
Approach Delay, s/veh		17.4			20.1			13.1			8.9	
Approach LOS		B			C			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.3	23.8		10.9	0.0	35.1		10.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	24.5	59.5		22.5	5.0	79.0		22.5				
Max Q Clear Time (g_c+I1), s	6.9	14.7		4.8	0.0	8.9		5.7				
Green Ext Time (p_c), s	0.5	4.6		0.0	0.0	4.5		1.0				

Intersection Summary		
HCM 6th Ctrl Delay		12.3
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	250	5	27	235	7	0	0	5	2	0	0
Future Vol, veh/h	1	250	5	27	235	7	0	0	5	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	272	5	29	255	8	0	0	5	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	263	0	0	277	0	0	594	598	275	596	596	259
Stage 1	-	-	-	-	-	-	277	277	-	317	317	-
Stage 2	-	-	-	-	-	-	317	321	-	279	279	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1295	-	-	1280	-	-	415	414	761	414	416	777
Stage 1	-	-	-	-	-	-	727	679	-	692	652	-
Stage 2	-	-	-	-	-	-	692	650	-	725	678	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1295	-	-	1280	-	-	408	404	761	404	406	777
Mov Cap-2 Maneuver	-	-	-	-	-	-	408	404	-	404	406	-
Stage 1	-	-	-	-	-	-	726	678	-	691	637	-
Stage 2	-	-	-	-	-	-	676	635	-	719	677	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.8	9.8	14
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	761	1295	-	-	1280	-	-	404
HCM Lane V/C Ratio	0.007	0.001	-	-	0.023	-	-	0.005
HCM Control Delay (s)	9.8	7.8	0	-	7.9	-	-	14
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0.1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	198	59	223	244	1	24	1	108	2	1	1
Future Volume (veh/h)	1	198	59	223	244	1	24	1	108	2	1	1
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	1	215	64	242	265	1	26	1	117	2	1	1
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	6	532	154	338	716	3	419	11	494	253	86	48
Arrive On Green	0.00	0.20	0.20	0.19	0.39	0.39	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1767	2695	782	1767	1847	7	1333	93	1572	471	702	391
Grp Volume(v), veh/h	1	139	140	242	0	266	27	0	117	4	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1715	1767	0	1854	1426	0	1572	1565	0	0
Q Serve(g_s), s	0.0	1.9	2.0	3.5	0.0	2.8	0.4	0.0	1.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.9	2.0	3.5	0.0	2.8	0.4	0.0	1.5	0.1	0.0	0.0
Prop In Lane	1.00		0.46	1.00		0.00	0.96		1.00	0.50		0.25
Lane Grp Cap(c), veh/h	6	348	338	338	0	718	431	0	494	388	0	0
V/C Ratio(X)	0.16	0.40	0.41	0.72	0.00	0.37	0.06	0.00	0.24	0.01	0.00	0.00
Avail Cap(c_a), veh/h	480	1626	1582	2398	0	3724	1461	0	1638	1443	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.8	9.7	9.7	10.5	0.0	6.1	10.8	0.0	7.0	10.7	0.0	0.0
Incr Delay (d2), s/veh	11.0	0.7	0.8	2.8	0.0	0.3	0.1	0.0	0.2	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	0.0	0.6	0.6	1.2	0.0	0.6	0.1	0.0	0.3	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	10.4	10.5	13.3	0.0	6.4	10.9	0.0	7.3	10.7	0.0	0.0
LnGrp LOS	C	B	B	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		280			508			144			4	
Approach Delay, s/veh		10.5			9.7			7.9			10.7	
Approach LOS		B			A			A			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.9	9.8	10.0		7.9	4.5	15.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		23.5	37.5	25.5		23.5	7.5	55.5				
Max Q Clear Time (g_c+I1), s		3.5	5.5	4.0		2.1	2.0	4.8				
Green Ext Time (p_c), s		0.4	0.7	1.6		0.0	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			9.7									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	229	69	323	475	185	53	78	239	219	98	64
Future Volume (veh/h)	32	229	69	323	475	185	53	78	239	219	98	64
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	35	249	75	351	516	201	58	85	260	238	107	70
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	65	671	299	511	751	291	92	652	526	302	1071	478
Arrive On Green	0.04	0.19	0.19	0.15	0.30	0.30	0.05	0.19	0.19	0.17	0.30	0.30
Sat Flow, veh/h	1767	3526	1572	3428	2482	963	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	35	249	75	351	366	351	58	85	260	238	107	70
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1682	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	1.1	3.6	2.4	5.7	10.8	10.9	1.9	1.2	7.8	7.6	1.3	1.9
Cycle Q Clear(g_c), s	1.1	3.6	2.4	5.7	10.8	10.9	1.9	1.2	7.8	7.6	1.3	1.9
Prop In Lane	1.00		1.00	1.00		0.57	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	65	671	299	511	533	509	92	652	526	302	1071	478
V/C Ratio(X)	0.54	0.37	0.25	0.69	0.69	0.69	0.63	0.13	0.49	0.79	0.10	0.15
Avail Cap(c_a), veh/h	254	1463	653	1365	1179	1126	344	1344	834	943	2538	1132
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	27.9	20.8	20.3	23.8	18.1	18.2	27.4	20.1	15.7	23.5	14.8	15.0
Incr Delay (d2), s/veh	6.6	0.3	0.4	1.6	1.6	1.7	7.0	0.1	0.7	4.6	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	0.6	1.4	0.9	2.3	4.2	4.0	0.9	0.5	2.6	3.3	0.5	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	21.2	20.8	25.4	19.7	19.8	34.4	20.2	16.4	28.1	14.8	15.1
LnGrp LOS	C	C	C	C	B	B	C	C	B	C	B	B
Approach Vol, veh/h		359			1068			403			415	
Approach Delay, s/veh		22.4			21.6			19.8			22.5	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	15.4	13.3	15.7	7.6	22.4	6.7	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	31.5	22.5	23.5	24.5	11.5	42.5	8.5	39.5
Max Q Clear Time (g_c+I1), s	9.6	9.8	7.7	5.6	3.9	3.9	3.1	12.9
Green Ext Time (p_c), s	0.7	1.1	1.1	1.7	0.1	0.9	0.0	5.0

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	496	226	319	465	0	0	0	0	575	187	563
Future Volume (veh/h)	0	496	226	319	465	0	0	0	0	575	187	563
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	539	246	347	505	0				414	498	547
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	803	358	474	1516	0				782	821	696
Arrive On Green	0.00	0.23	0.23	0.14	0.43	0.00				0.44	0.44	0.44
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	539	246	347	505	0				414	498	547
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	9.8	10.1	6.9	6.7	0.0				12.0	14.4	21.0
Cycle Q Clear(g_c), s	0.0	9.8	10.1	6.9	6.7	0.0				12.0	14.4	21.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	803	358	474	1516	0				782	821	696
V/C Ratio(X)	0.00	0.67	0.69	0.73	0.33	0.00				0.53	0.61	0.79
Avail Cap(c_a), veh/h	0	1343	599	947	2541	0				1504	1579	1338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	24.9	25.0	29.2	13.4	0.0				14.3	15.0	16.8
Incr Delay (d2), s/veh	0.0	1.0	2.3	2.2	0.1	0.0				0.6	0.7	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
%ile BackOfQ(50%),veh/ln	0.0	4.0	3.8	2.8	2.5	0.0				4.5	5.6	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	25.8	27.3	31.4	13.5	0.0				14.9	15.7	18.8
LnGrp LOS	A	C	C	C	B	A				B	B	B
Approach Vol, veh/h		785			852						1459	
Approach Delay, s/veh		26.3			20.8						16.6	
Approach LOS		C			C						B	
Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			14.3	20.6		35.8		34.9				
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s			19.5	26.9		60.1		50.9				
Max Q Clear Time (g_c+I1), s			8.9	12.1		23.0		8.7				
Green Ext Time (p_c), s			0.9	4.0		8.3		3.8				
Intersection Summary												
HCM 6th Ctrl Delay			20.2									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	449	602	364	595	105	200	114	271	99	118	24
Future Volume (veh/h)	11	449	602	364	595	105	200	114	271	99	118	24
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	488	654	396	647	114	217	124	295	108	128	26
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	26	1473	701	538	1296	228	274	379	568	141	193	39
Arrive On Green	0.01	0.29	0.29	0.16	0.43	0.43	0.15	0.20	0.20	0.08	0.13	0.13
Sat Flow, veh/h	1767	5066	1572	3428	2996	527	1767	1856	1572	1767	1497	304
Grp Volume(v), veh/h	12	488	654	396	380	381	217	124	295	108	0	154
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1761	1767	1856	1572	1767	0	1801
Q Serve(g_s), s	0.5	5.1	19.5	7.4	10.5	10.5	7.9	3.8	9.9	4.0	0.0	5.5
Cycle Q Clear(g_c), s	0.5	5.1	19.5	7.4	10.5	10.5	7.9	3.8	9.9	4.0	0.0	5.5
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	26	1473	701	538	763	762	274	379	568	141	0	232
V/C Ratio(X)	0.45	0.33	0.93	0.74	0.50	0.50	0.79	0.33	0.52	0.77	0.00	0.66
Avail Cap(c_a), veh/h	132	1473	701	1084	938	937	1104	1278	1330	398	0	521
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	0.00	1.00
Uniform Delay (d), s/veh	32.8	18.7	17.6	27.0	13.8	13.8	27.3	22.7	16.8	30.2	0.0	27.8
Incr Delay (d2), s/veh	11.7	0.1	19.5	2.0	0.5	0.5	5.2	0.5	0.7	8.4	0.0	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	0.3	1.9	12.1	3.0	3.8	3.8	3.6	1.6	3.4	2.0	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.5	18.8	37.1	28.9	14.3	14.3	32.5	23.2	17.6	38.7	0.0	31.0
LnGrp LOS	D	B	D	C	B	B	C	C	B	D	A	C
Approach Vol, veh/h		1154			1157			636			262	
Approach Delay, s/veh		29.5			19.3			23.8			34.2	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	18.2	15.0	24.0	14.9	13.2	5.5	33.5
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	15.1	46.2	21.2	19.5	41.9	19.4	5.0	35.7
Max Q Clear Time (g_c+I1), s	6.0	11.9	9.4	21.5	9.9	7.5	2.5	12.5
Green Ext Time (p_c), s	0.2	1.8	1.1	0.0	0.6	0.6	0.0	5.1

Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	2	63	0	0	0	119	261	4	14	621	441
Future Volume (veh/h)	336	2	63	0	0	0	119	261	4	14	621	441
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	366	0	68	0	0	0	129	284	4	15	675	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	659	0	293	0	5	0	176	1527	21	34	1230	
Arrive On Green	0.19	0.00	0.19	0.00	0.00	0.00	0.10	0.43	0.43	0.02	0.35	0.00
Sat Flow, veh/h	3534	0	1572	0	1856	0	1767	3559	50	1767	3526	1572
Grp Volume(v), veh/h	366	0	68	0	0	0	129	140	148	15	675	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	1856	0	1767	1763	1847	1767	1763	1572
Q Serve(g_s), s	3.5	0.0	1.4	0.0	0.0	0.0	2.6	1.8	1.8	0.3	5.7	0.0
Cycle Q Clear(g_c), s	3.5	0.0	1.4	0.0	0.0	0.0	2.6	1.8	1.8	0.3	5.7	0.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	659	0	293	0	5	0	176	756	792	34	1230	
V/C Ratio(X)	0.56	0.00	0.23	0.00	0.00	0.00	0.74	0.19	0.19	0.44	0.55	
Avail Cap(c_a), veh/h	2535	0	1128	0	904	0	933	2433	2549	311	3626	
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.6	0.0	12.8	0.0	0.0	0.0	16.2	6.5	6.5	17.9	9.7	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.4	0.0	0.0	0.0	5.9	0.1	0.1	8.6	0.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.4	0.0	0.0	0.0	1.2	0.5	0.5	0.2	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	0.0	13.2	0.0	0.0	0.0	22.0	6.7	6.7	26.6	10.1	0.0
LnGrp LOS	B	A	B	A	A	A	C	A	A	C	B	
Approach Vol, veh/h		434			0			417			690	
Approach Delay, s/veh		14.2			0.0			11.4			10.4	
Approach LOS		B						B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	20.3		11.4	8.2	17.4		0.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	6.5	51.0		26.5	19.5	38.0		18.0
Max Q Clear Time (g_c+I1), s	2.3	3.8		5.5	4.6	7.7		0.0
Green Ext Time (p_c), s	0.0	1.8		1.5	0.3	5.2		0.0

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2.1					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	82	133	10	0	66
Future Vol, veh/h	0	82	133	10	0	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	89	145	11	0	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	145
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	900
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	900
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	900
HCM Lane V/C Ratio	-	-	-	0.08
HCM Control Delay (s)	-	-	-	9.3
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	84	10	12	105	30	4	0	5	19	1	14
Future Volume (veh/h)	21	84	10	12	105	30	4	0	5	19	1	14
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	91	11	13	114	33	4	0	5	21	1	15
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	297	36	31	317	269	9	0	11	77	4	72
Arrive On Green	0.03	0.18	0.18	0.02	0.17	0.17	0.01	0.00	0.01	0.05	0.05	0.05
Sat Flow, veh/h	1767	1624	196	1767	1856	1572	735	0	919	1691	81	1572
Grp Volume(v), veh/h	23	0	102	13	114	33	9	0	0	22	0	15
Grp Sat Flow(s),veh/h/ln	1767	0	1820	1767	1856	1572	1653	0	0	1771	0	1572
Q Serve(g_s), s	0.3	0.0	1.2	0.2	1.3	0.4	0.1	0.0	0.0	0.3	0.0	0.2
Cycle Q Clear(g_c), s	0.3	0.0	1.2	0.2	1.3	0.4	0.1	0.0	0.0	0.3	0.0	0.2
Prop In Lane	1.00		0.11	1.00		1.00	0.44		0.56	0.95		1.00
Lane Grp Cap(c), veh/h	52	0	333	31	317	269	20	0	0	81	0	72
V/C Ratio(X)	0.44	0.00	0.31	0.43	0.36	0.12	0.45	0.00	0.00	0.27	0.00	0.21
Avail Cap(c_a), veh/h	1275	0	3189	911	2868	2431	1533	0	0	1789	0	1588
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	8.6	11.8	8.9	8.5	11.9	0.0	0.0	11.2	0.0	11.2
Incr Delay (d2), s/veh	5.7	0.0	0.5	9.1	0.7	0.2	14.9	0.0	0.0	1.8	0.0	1.4
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	0.0	0.3	0.1	0.4	0.1	0.1	0.0	0.0	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	0.0	9.1	20.9	9.6	8.7	26.8	0.0	0.0	13.0	0.0	12.6
LnGrp LOS	B	A	A	C	A	A	C	A	A	B	A	B
Approach Vol, veh/h		125			160			9			37	
Approach Delay, s/veh		10.6			10.3			26.8			12.8	
Approach LOS		B			B			C			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		4.8	4.9	8.9		5.6	5.2	8.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	12.5	42.5		24.5	17.5	37.5				
Max Q Clear Time (g_c+I1), s		2.1	2.2	3.2		2.3	2.3	3.3				
Green Ext Time (p_c), s		0.0	0.0	0.6		0.1	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			11.2									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	114	12	17	207	219	154
Future Volume (veh/h)	114	12	17	207	219	154
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	124	13	18	225	238	167
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	196	42	1772	590	398
Arrive On Green	0.12	0.12	0.02	0.50	0.29	0.29
Sat Flow, veh/h	1767	1572	1767	3618	2108	1359
Grp Volume(v), veh/h	124	13	18	225	207	198
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1611
Q Serve(g_s), s	1.6	0.2	0.2	0.8	2.3	2.4
Cycle Q Clear(g_c), s	1.6	0.2	0.2	0.8	2.3	2.4
Prop In Lane	1.00	1.00	1.00			0.84
Lane Grp Cap(c), veh/h	220	196	42	1772	516	471
V/C Ratio(X)	0.56	0.07	0.43	0.13	0.40	0.42
Avail Cap(c_a), veh/h	2892	2573	1208	10444	3688	3371
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	9.9	9.3	11.6	3.2	6.8	6.9
Incr Delay (d2), s/veh	2.3	0.1	6.9	0.0	0.5	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	0.5	0.0	0.1	0.1	0.5	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.2	9.5	18.6	3.2	7.3	7.5
LnGrp LOS	B	A	B	A	A	A
Approach Vol, veh/h	137			243	405	
Approach Delay, s/veh	11.9			4.4	7.4	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		16.6		7.5	5.1	11.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		71.5		39.5	16.5	50.5
Max Q Clear Time (g_c+I1), s		2.8		3.6	2.2	4.4
Green Ext Time (p_c), s		1.6		0.4	0.0	2.8

Intersection Summary			
HCM 6th Ctrl Delay			7.3
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	580	48	321	534	372	63	92	231	331	105	76
Future Volume (veh/h)	73	580	48	321	534	372	63	92	231	331	105	76
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	79	630	52	349	580	404	68	100	251	360	114	83
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	1142	355	505	1101	730	99	637	516	520	512	434
Arrive On Green	0.06	0.23	0.23	0.15	0.31	0.31	0.06	0.18	0.18	0.15	0.28	0.28
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	79	630	52	349	580	404	68	100	251	360	114	83
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	2.7	6.7	1.6	5.9	8.3	11.3	2.3	1.5	7.8	6.1	2.9	2.5
Cycle Q Clear(g_c), s	2.7	6.7	1.6	5.9	8.3	11.3	2.3	1.5	7.8	6.1	2.9	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	107	1142	355	505	1101	730	99	637	516	520	512	434
V/C Ratio(X)	0.74	0.55	0.15	0.69	0.53	0.55	0.69	0.16	0.49	0.69	0.22	0.19
Avail Cap(c_a), veh/h	449	2283	709	1377	2109	1179	362	1358	837	1489	1140	966
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	28.2	20.9	18.9	24.7	17.3	11.8	28.3	21.1	16.4	24.5	17.0	16.9
Incr Delay (d2), s/veh	9.5	0.4	0.2	1.7	0.4	0.7	8.1	0.1	0.7	1.7	0.2	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	1.4	2.5	0.6	2.4	3.1	3.5	1.1	0.6	2.6	2.4	1.2	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	21.3	19.1	26.4	17.7	12.5	36.4	21.2	17.1	26.2	17.3	17.1
LnGrp LOS	D	C	B	C	B	B	D	C	B	C	B	B
Approach Vol, veh/h		761			1333			419			557	
Approach Delay, s/veh		22.9			18.4			21.2			23.0	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	15.5	13.5	18.3	7.9	21.3	8.2	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	26.5	23.5	24.5	27.5	12.5	37.5	15.5	36.5
Max Q Clear Time (g_c+I1), s	8.1	9.8	7.9	8.7	4.3	4.9	4.7	13.3
Green Ext Time (p_c), s	1.2	1.2	1.1	4.4	0.1	0.9	0.1	5.8

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	5	115	5	224	43	1545	110	173	1335	6
Future Volume (veh/h)	3	1	5	115	5	224	43	1545	110	173	1335	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	3	1	5	125	5	243	47	1679	120	188	1451	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	44	27	34	183	5	267	62	1944	138	219	2415	12
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.03	0.58	0.58	0.12	0.67	0.67
Sat Flow, veh/h	0	158	198	696	28	1572	1767	3339	237	1767	3598	17
Grp Volume(v), veh/h	9	0	0	130	0	243	47	879	920	188	711	747
Grp Sat Flow(s),veh/h/ln	356	0	0	724	0	1572	1767	1763	1813	1767	1763	1852
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	16.5	2.9	45.3	46.8	11.4	24.2	24.2
Cycle Q Clear(g_c), s	18.5	0.0	0.0	18.5	0.0	16.5	2.9	45.3	46.8	11.4	24.2	24.2
Prop In Lane	0.33		0.56	0.96		1.00	1.00		0.13	1.00		0.01
Lane Grp Cap(c), veh/h	105	0	0	188	0	267	62	1026	1055	219	1183	1243
V/C Ratio(X)	0.09	0.00	0.00	0.69	0.00	0.91	0.76	0.86	0.87	0.86	0.60	0.60
Avail Cap(c_a), veh/h	105	0	0	188	0	267	144	1138	1171	287	1281	1346
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	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	0.0	0.0	45.7	0.0	44.4	52.1	19.0	19.3	46.7	9.9	9.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	10.4	0.0	32.3	17.5	6.2	6.9	17.8	0.7	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	0.2	0.0	0.0	4.1	0.0	8.8	1.6	18.9	20.3	6.0	8.6	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	0.0	0.0	56.1	0.0	76.7	69.6	25.1	26.2	64.5	10.5	10.5
LnGrp LOS	D	A	A	E	A	E	E	C	C	E	B	B
Approach Vol, veh/h		9			373			1846			1646	
Approach Delay, s/veh		39.0			69.5			26.8			16.7	
Approach LOS		D			E			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	67.9		23.0	8.3	77.6		23.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	17.7	70.3		18.5	8.9	79.1		18.5
Max Q Clear Time (g_c+I1), s	13.4	48.8		20.5	4.9	26.2		20.5
Green Ext Time (p_c), s	0.2	14.5		0.0	0.0	15.9		0.0

Intersection Summary	
HCM 6th Ctrl Delay	26.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	254	4	20	339	67	6	5	16	74	5	35
Future Vol, veh/h	30	254	4	20	339	67	6	5	16	74	5	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	33	276	4	22	368	73	7	5	17	80	5	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	441	0	0	280	0	0	814	829	278	804	795	405
Stage 1	-	-	-	-	-	-	344	344	-	449	449	-
Stage 2	-	-	-	-	-	-	470	485	-	355	346	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1114	-	-	1277	-	-	295	305	758	300	319	644
Stage 1	-	-	-	-	-	-	669	635	-	587	571	-
Stage 2	-	-	-	-	-	-	572	550	-	660	634	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1114	-	-	1277	-	-	263	289	758	278	303	644
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	289	-	278	303	-
Stage 1	-	-	-	-	-	-	646	613	-	566	561	-
Stage 2	-	-	-	-	-	-	524	541	-	617	612	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.4	13.7	21.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	441	1114	-	-	1277	-	-	338
HCM Lane V/C Ratio	0.067	0.029	-	-	0.017	-	-	0.367
HCM Control Delay (s)	13.7	8.3	0	-	7.9	-	-	21.7
HCM Lane LOS	B	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-	-	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	269	81	311	320	177	80	57	250	200	34	39
Future Volume (veh/h)	29	269	81	311	320	177	80	57	250	200	34	39
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	32	292	88	338	348	192	87	62	272	217	37	42
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	61	491	145	409	427	236	391	254	919	353	61	51
Arrive On Green	0.03	0.18	0.18	0.23	0.38	0.38	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1767	2682	793	1767	1124	620	829	720	1572	695	174	144
Grp Volume(v), veh/h	32	190	190	338	0	540	149	0	272	296	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1713	1767	0	1744	1548	0	1572	1012	0	0
Q Serve(g_s), s	1.0	5.7	5.9	10.5	0.0	16.1	0.0	0.0	5.0	12.6	0.0	0.0
Cycle Q Clear(g_c), s	1.0	5.7	5.9	10.5	0.0	16.1	3.7	0.0	5.0	16.4	0.0	0.0
Prop In Lane	1.00		0.46	1.00		0.36	0.58		1.00	0.73		0.14
Lane Grp Cap(c), veh/h	61	323	314	409	0	662	645	0	919	465	0	0
V/C Ratio(X)	0.52	0.59	0.61	0.83	0.00	0.82	0.23	0.00	0.30	0.64	0.00	0.00
Avail Cap(c_a), veh/h	167	568	552	898	0	1283	1103	0	1402	820	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	27.5	21.7	21.8	21.2	0.0	16.2	13.3	0.0	6.1	18.4	0.0	0.0
Incr Delay (d2), s/veh	6.7	1.7	1.9	4.3	0.0	2.5	0.2	0.0	0.2	1.5	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	2.3	2.4	4.4	0.0	6.0	1.3	0.0	1.3	3.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	23.4	23.7	25.5	0.0	18.7	13.5	0.0	6.2	19.9	0.0	0.0
LnGrp LOS	C	C	C	C	A	B	B	A	A	B	A	A
Approach Vol, veh/h		412			878			421			296	
Approach Delay, s/veh		24.4			21.3			8.8			19.9	
Approach LOS		C			C			A			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		25.0	17.9	15.1		25.0	6.5	26.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		38.3	29.5	18.7		38.3	5.5	42.7				
Max Q Clear Time (g_c+I1), s		7.0	12.5	7.9		18.4	3.0	18.1				
Green Ext Time (p_c), s		1.9	0.9	1.6		2.1	0.0	3.9				
Intersection Summary												
HCM 6th Ctrl Delay			19.1									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	891	202	450	1101	420	90	246	441	287	245	48
Future Volume (veh/h)	62	891	202	450	1101	420	90	246	441	287	245	48
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	67	968	220	489	1197	457	98	267	479	312	266	52
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	1234	550	549	1165	431	122	567	505	317	955	426
Arrive On Green	0.05	0.35	0.35	0.16	0.46	0.46	0.07	0.16	0.16	0.18	0.27	0.27
Sat Flow, veh/h	1767	3526	1572	3428	2519	932	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	67	968	220	489	826	828	98	267	479	312	266	52
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1688	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	4.5	29.5	12.7	16.8	55.5	55.5	6.6	8.3	19.3	21.1	7.1	3.0
Cycle Q Clear(g_c), s	4.5	29.5	12.7	16.8	55.5	55.5	6.6	8.3	19.3	21.1	7.1	3.0
Prop In Lane	1.00		1.00	1.00		0.55	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	84	1234	550	549	815	781	122	567	505	317	955	426
V/C Ratio(X)	0.80	0.78	0.40	0.89	1.01	1.06	0.80	0.47	0.95	0.99	0.28	0.12
Avail Cap(c_a), veh/h	84	1234	550	597	815	781	196	567	505	317	955	426
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	56.6	35.0	29.5	49.4	32.3	32.3	55.0	45.7	39.8	49.1	34.5	33.0
Incr Delay (d2), s/veh	40.2	3.4	0.5	14.7	34.9	49.4	11.4	0.6	27.7	46.5	0.2	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	2.9	13.1	4.9	8.3	30.7	32.5	3.3	3.7	17.5	13.4	3.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.8	38.4	30.0	64.1	67.1	81.7	66.4	46.3	67.5	95.6	34.7	33.1
LnGrp LOS	F	D	C	E	F	F	E	D	E	F	C	C
Approach Vol, veh/h		1255			2143			844			630	
Approach Delay, s/veh		40.0			72.1			60.7			64.7	
Approach LOS		D			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	23.8	23.7	46.5	12.8	37.0	10.2	60.0
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	19.3	20.9	40.3	13.3	27.5	5.7	55.5
Max Q Clear Time (g_c+I1), s	23.1	21.3	18.8	31.5	8.6	9.1	6.5	57.5
Green Ext Time (p_c), s	0.0	0.0	0.4	4.8	0.1	1.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	60.9
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1030	589	124	1004	0	0	0	0	1246	202	124
Future Volume (veh/h)	0	1030	589	124	1004	0	0	0	0	1246	202	124
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1120	640	135	1091	0				1511	0	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1268	566	177	1591	0				1657	0	737
Arrive On Green	0.00	0.36	0.36	0.05	0.45	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	3618	1572	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1120	640	135	1091	0				1511	0	70
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	33.6	40.5	4.4	27.7	0.0				44.7	0.0	2.8
Cycle Q Clear(g_c), s	0.0	33.6	40.5	4.4	27.7	0.0				44.7	0.0	2.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1268	566	177	1591	0				1657	0	737
V/C Ratio(X)	0.00	0.88	1.13	0.76	0.69	0.00				0.91	0.00	0.09
Avail Cap(c_a), veh/h	0	1268	566	177	1591	0				1890	0	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.8	36.0	52.7	24.5	0.0				27.7	0.0	16.6
Incr Delay (d2), s/veh	0.0	7.6	79.4	17.8	1.2	0.0				6.6	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
%ile BackOfQ(50%),veh/ln	0.0	15.4	27.6	2.3	11.5	0.0				19.7	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	41.4	115.5	70.5	25.8	0.0				34.4	0.0	16.7
LnGrp LOS	A	D	F	E	C	A				C	A	B
Approach Vol, veh/h		1760			1226						1581	
Approach Delay, s/veh		68.4			30.7						33.6	
Approach LOS		E			C						C	
Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.3	45.0		57.3		55.3				
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s			5.8	40.5		60.2		50.8				
Max Q Clear Time (g_c+I1), s			6.4	42.5		46.7		29.7				
Green Ext Time (p_c), s			0.0	0.0		6.1		8.3				
Intersection Summary												
HCM 6th Ctrl Delay			46.2									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	691	716	365	409	112	692	173	601	194	271	27
Future Volume (veh/h)	15	691	716	365	409	112	692	173	601	194	271	27
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	16	751	778	397	445	122	752	188	653	211	295	29
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	30	760	858	403	686	186	700	827	886	241	310	31
Arrive On Green	0.02	0.15	0.15	0.12	0.25	0.25	0.40	0.45	0.45	0.14	0.19	0.19
Sat Flow, veh/h	1767	5066	1572	3428	2739	745	1767	1856	1572	1767	1663	163
Grp Volume(v), veh/h	16	751	778	397	285	282	752	188	653	211	0	324
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1721	1767	1856	1572	1767	0	1826
Q Serve(g_s), s	1.1	17.8	18.0	13.9	17.4	17.6	47.5	7.5	37.2	14.0	0.0	21.1
Cycle Q Clear(g_c), s	1.1	17.8	18.0	13.9	17.4	17.6	47.5	7.5	37.2	14.0	0.0	21.1
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	30	760	858	403	441	431	700	827	886	241	0	341
V/C Ratio(X)	0.53	0.99	0.91	0.99	0.65	0.65	1.08	0.23	0.74	0.87	0.00	0.95
Avail Cap(c_a), veh/h	75	760	858	403	441	431	700	827	886	353	0	341
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	0.00	1.00
Uniform Delay (d), s/veh	58.5	50.9	24.5	52.8	40.2	40.3	36.3	20.5	19.6	50.8	0.0	48.3
Incr Delay (d2), s/veh	13.3	29.6	13.2	40.9	3.3	3.5	56.0	0.1	3.3	15.1	0.0	35.8
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	0.6	9.6	22.0	8.2	7.9	7.9	30.8	3.3	13.8	7.2	0.0	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.8	80.5	37.7	93.7	43.5	43.9	92.2	20.6	22.8	65.9	0.0	84.1
LnGrp LOS	E	F	D	F	D	D	F	C	C	E	A	F
Approach Vol, veh/h		1545			964			1593			535	
Approach Delay, s/veh		58.9			64.3			55.3			76.9	
Approach LOS		E			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.9	58.0	18.6	22.5	52.0	26.9	6.6	34.5
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	24.0	45.9	14.1	18.0	47.5	22.4	5.1	27.0
Max Q Clear Time (g_c+I1), s	16.0	39.2	15.9	20.0	49.5	23.1	3.1	19.6
Green Ext Time (p_c), s	0.4	2.2	0.0	0.0	0.0	0.0	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	60.9
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	767	2	57	4	2	13	469	686	1	8	726	618
Future Volume (veh/h)	767	2	57	4	2	13	469	686	1	8	726	618
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	835	0	62	4	2	14	510	746	1	9	789	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	910	0	405	7	3	24	528	1929	3	19	868	
Arrive On Green	0.26	0.00	0.26	0.02	0.02	0.02	0.30	0.53	0.53	0.01	0.25	0.00
Sat Flow, veh/h	3534	0	1572	327	163	1143	1767	3613	5	1767	3526	1572
Grp Volume(v), veh/h	835	0	62	20	0	0	510	364	383	9	789	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	1633	0	0	1767	1763	1855	1767	1763	1572
Q Serve(g_s), s	23.4	0.0	3.1	1.2	0.0	0.0	29.0	12.4	12.4	0.5	22.2	0.0
Cycle Q Clear(g_c), s	23.4	0.0	3.1	1.2	0.0	0.0	29.0	12.4	12.4	0.5	22.2	0.0
Prop In Lane	1.00		1.00	0.20		0.70	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	910	0	405	35	0	0	528	941	990	19	868	
V/C Ratio(X)	0.92	0.00	0.15	0.58	0.00	0.00	0.97	0.39	0.39	0.46	0.91	
Avail Cap(c_a), veh/h	952	0	424	288	0	0	528	941	990	87	898	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.8	0.0	29.3	49.5	0.0	0.0	35.3	14.0	14.0	50.2	37.4	0.0
Incr Delay (d2), s/veh	13.1	0.0	0.2	14.3	0.0	0.0	30.6	0.3	0.2	16.0	12.8	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	11.6	0.0	1.2	0.6	0.0	0.0	16.7	4.8	5.0	0.3	10.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.9	0.0	29.5	63.8	0.0	0.0	65.9	14.2	14.2	66.2	50.1	0.0
LnGrp LOS	D	A	C	E	A	A	E	B	B	E	D	
Approach Vol, veh/h		897			20			1257			798	
Approach Delay, s/veh		48.5			63.8			35.2			50.3	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	59.0		30.8	35.0	29.6		6.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	51.5		27.5	30.5	26.0		18.0
Max Q Clear Time (g_c+I1), s	2.5	14.4		25.4	31.0	24.2		3.2
Green Ext Time (p_c), s	0.0	5.3		0.9	0.0	1.0		0.0

Intersection Summary			
HCM 6th Ctrl Delay			43.5
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	191	67	10	0	58
Future Vol, veh/h	0	191	67	10	0	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	208	73	11	0	63

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	73
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	986
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	986
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	986
HCM Lane V/C Ratio	-	-	-	0.064
HCM Control Delay (s)	-	-	-	8.9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	154	5	2	52	56	12	4	22	38	1	25
Future Volume (veh/h)	37	154	5	2	52	56	12	4	22	38	1	25
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	40	167	5	2	57	61	13	4	24	41	1	27
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	85	375	11	7	304	258	26	8	47	129	3	118
Arrive On Green	0.05	0.21	0.21	0.00	0.16	0.16	0.05	0.05	0.05	0.07	0.07	0.07
Sat Flow, veh/h	1767	1792	54	1767	1856	1572	525	161	969	1727	42	1572
Grp Volume(v), veh/h	40	0	172	2	57	61	41	0	0	42	0	27
Grp Sat Flow(s),veh/h/ln	1767	0	1846	1767	1856	1572	1655	0	0	1769	0	1572
Q Serve(g_s), s	0.6	0.0	2.2	0.0	0.7	0.9	0.7	0.0	0.0	0.6	0.0	0.4
Cycle Q Clear(g_c), s	0.6	0.0	2.2	0.0	0.7	0.9	0.7	0.0	0.0	0.6	0.0	0.4
Prop In Lane	1.00		0.03	1.00		1.00	0.32		0.59	0.98		1.00
Lane Grp Cap(c), veh/h	85	0	386	7	304	258	81	0	0	132	0	118
V/C Ratio(X)	0.47	0.00	0.45	0.31	0.19	0.24	0.51	0.00	0.00	0.32	0.00	0.23
Avail Cap(c_a), veh/h	1076	0	2691	685	2294	1944	1679	0	0	1600	0	1422
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.6	0.0	9.3	13.5	9.8	9.9	12.6	0.0	0.0	11.9	0.0	11.8
Incr Delay (d2), s/veh	4.0	0.0	0.8	24.5	0.3	0.5	4.8	0.0	0.0	1.4	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	0.3	0.0	0.7	0.1	0.2	0.2	0.3	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	0.0	10.1	37.9	10.1	10.3	17.4	0.0	0.0	13.2	0.0	12.8
LnGrp LOS	B	A	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		212			120			41			69	
Approach Delay, s/veh		11.4			10.7			17.4			13.1	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		5.8	4.6	10.2		6.5	5.8	8.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		27.5	10.5	39.5		24.5	16.5	33.5				
Max Q Clear Time (g_c+I1), s		2.7	2.0	4.2		2.6	2.6	2.9				
Green Ext Time (p_c), s		0.2	0.0	1.0		0.2	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			12.0									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	164	30	32	479	656	114
Future Volume (veh/h)	164	30	32	479	656	114
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	178	33	35	521	713	124
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	262	233	73	2095	1273	221
Arrive On Green	0.15	0.15	0.04	0.59	0.42	0.42
Sat Flow, veh/h	1767	1572	1767	3618	3095	522
Grp Volume(v), veh/h	178	33	35	521	418	419
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1762
Q Serve(g_s), s	3.3	0.6	0.7	2.5	6.3	6.3
Cycle Q Clear(g_c), s	3.3	0.6	0.7	2.5	6.3	6.3
Prop In Lane	1.00	1.00	1.00			0.30
Lane Grp Cap(c), veh/h	262	233	73	2095	748	747
V/C Ratio(X)	0.68	0.14	0.48	0.25	0.56	0.56
Avail Cap(c_a), veh/h	1695	1508	582	7822	3104	3102
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	14.1	12.9	16.4	3.4	7.6	7.6
Incr Delay (d2), s/veh	3.1	0.3	4.8	0.1	0.7	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	1.3	0.0	0.3	0.3	1.6	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.2	13.2	21.2	3.4	8.3	8.3
LnGrp LOS	B	B	C	A	A	A
Approach Vol, veh/h	211			556	837	
Approach Delay, s/veh	16.6			4.6	8.3	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		25.3		9.7	5.9	19.3
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		77.5		33.5	11.5	61.5
Max Q Clear Time (g_c+I1), s		4.5		5.3	2.7	8.3
Green Ext Time (p_c), s		4.1		0.6	0.0	6.5

Intersection Summary			
HCM 6th Ctrl Delay			8.1
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	1059	122	376	926	681	85	179	421	619	227	139
Future Volume (veh/h)	66	1059	122	376	926	681	85	179	421	619	227	139
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	1151	133	409	1007	740	92	195	458	673	247	151
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	92	1511	469	482	1364	956	116	639	506	757	624	529
Arrive On Green	0.05	0.30	0.30	0.14	0.39	0.39	0.07	0.18	0.18	0.22	0.34	0.34
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	72	1151	133	409	1007	740	92	195	458	673	247	151
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	4.6	23.3	7.3	13.2	27.7	39.5	5.8	5.4	20.5	21.5	11.5	8.0
Cycle Q Clear(g_c), s	4.6	23.3	7.3	13.2	27.7	39.5	5.8	5.4	20.5	21.5	11.5	8.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	92	1511	469	482	1364	956	116	639	506	757	624	529
V/C Ratio(X)	0.78	0.76	0.28	0.85	0.74	0.77	0.79	0.31	0.91	0.89	0.40	0.29
Avail Cap(c_a), veh/h	119	1511	469	621	1383	964	201	639	506	894	624	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	36.0	30.4	47.5	29.8	16.4	52.1	40.2	36.7	42.7	28.8	27.6
Incr Delay (d2), s/veh	22.1	2.3	0.3	8.6	2.1	4.0	11.3	0.3	19.8	9.8	0.4	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	9.9	2.8	6.2	11.9	14.2	2.9	2.4	14.7	10.1	5.2	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.2	38.4	30.8	56.1	31.9	20.4	63.4	40.4	56.5	52.5	29.2	27.9
LnGrp LOS	E	D	C	E	C	C	E	D	E	D	C	C
Approach Vol, veh/h		1356			2156			745			1071	
Approach Delay, s/veh		39.6			32.5			53.2			43.7	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.5	25.0	20.4	38.3	11.9	42.5	10.4	48.3
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	29.5	20.5	20.5	31.5	12.9	37.1	7.6	44.4
Max Q Clear Time (g_c+I1), s	23.5	22.5	15.2	25.3	7.8	13.5	6.6	41.5
Green Ext Time (p_c), s	1.5	0.0	0.7	4.0	0.1	1.9	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	39.4
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	7	5	108	5	137	0	476	68	196	517	9
Future Volume (veh/h)	9	7	5	108	5	137	0	476	68	196	517	9
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	10	8	5	117	5	149	0	517	74	213	562	10
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	160	108	45	362	13	232	4	664	95	279	1214	22
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.00	0.42	0.42	0.16	0.67	0.67
Sat Flow, veh/h	366	732	305	1477	85	1572	1767	1587	227	1767	1817	32
Grp Volume(v), veh/h	23	0	0	122	0	149	0	0	591	213	0	572
Grp Sat Flow(s),veh/h/ln	1403	0	0	1562	0	1572	1767	0	1815	1767	0	1850
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	4.4	0.0	0.0	13.7	5.6	0.0	7.3
Cycle Q Clear(g_c), s	3.1	0.0	0.0	3.1	0.0	4.4	0.0	0.0	13.7	5.6	0.0	7.3
Prop In Lane	0.43		0.22	0.96		1.00	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	313	0	0	375	0	232	4	0	759	279	0	1236
V/C Ratio(X)	0.07	0.00	0.00	0.33	0.00	0.64	0.00	0.00	0.78	0.76	0.00	0.46
Avail Cap(c_a), veh/h	742	0	0	786	0	692	181	0	2210	922	0	3028
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	0.0	19.1	0.0	19.6	0.0	0.0	12.3	19.7	0.0	3.9
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	3.0	0.0	0.0	1.8	4.3	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	0.2	0.0	0.0	1.2	0.0	1.6	0.0	0.0	4.8	2.4	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	0.0	0.0	19.6	0.0	22.6	0.0	0.0	14.0	24.0	0.0	4.2
LnGrp LOS	B	A	A	B	A	C	A	A	B	C	A	A
Approach Vol, veh/h		23			271			591			785	
Approach Delay, s/veh		18.1			21.2			14.0			9.5	
Approach LOS		B			C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.2	24.9		11.7	0.0	37.2		11.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	25.5	59.5		21.5	5.0	80.0		21.5				
Max Q Clear Time (g_c+I1), s	7.6	15.7		5.1	0.0	9.3		6.4				
Green Ext Time (p_c), s	0.5	4.7		0.0	0.0	4.5		1.0				

Intersection Summary			
HCM 6th Ctrl Delay			13.1
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	270	6	35	252	7	1	0	11	2	0	0
Future Vol, veh/h	1	270	6	35	252	7	1	0	11	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	293	7	38	274	8	1	0	12	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	282	0	0	300	0	0	653	657	297	659	656	278
Stage 1	-	-	-	-	-	-	299	299	-	354	354	-
Stage 2	-	-	-	-	-	-	354	358	-	305	302	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1275	-	-	1255	-	-	379	383	740	376	384	758
Stage 1	-	-	-	-	-	-	708	664	-	661	629	-
Stage 2	-	-	-	-	-	-	661	626	-	702	662	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1275	-	-	1255	-	-	370	371	740	361	372	758
Mov Cap-2 Maneuver	-	-	-	-	-	-	370	371	-	361	372	-
Stage 1	-	-	-	-	-	-	707	663	-	660	610	-
Stage 2	-	-	-	-	-	-	641	607	-	690	661	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.9	10.4	15
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	683	1275	-	-	1255	-	-	361
HCM Lane V/C Ratio	0.019	0.001	-	-	0.03	-	-	0.006
HCM Control Delay (s)	10.4	7.8	0	-	8	-	-	15
HCM Lane LOS	B	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	204	79	318	252	1	41	3	188	2	3	1
Future Volume (veh/h)	1	204	79	318	252	1	41	3	188	2	3	1
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	1	222	86	346	274	1	45	3	204	2	3	1
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	5	468	176	460	824	3	408	21	655	181	176	43
Arrive On Green	0.00	0.19	0.19	0.26	0.45	0.45	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1767	2507	942	1767	1848	7	1301	133	1572	254	1126	276
Grp Volume(v), veh/h	1	154	154	346	0	275	48	0	204	6	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1686	1767	0	1854	1434	0	1572	1656	0	0
Q Serve(g_s), s	0.0	2.6	2.8	6.1	0.0	3.3	0.8	0.0	3.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.6	2.8	6.1	0.0	3.3	1.0	0.0	3.0	0.1	0.0	0.0
Prop In Lane	1.00		0.56	1.00		0.00	0.94		1.00	0.33		0.17
Lane Grp Cap(c), veh/h	5	329	315	460	0	827	428	0	655	399	0	0
V/C Ratio(X)	0.19	0.47	0.49	0.75	0.00	0.33	0.11	0.00	0.31	0.02	0.00	0.00
Avail Cap(c_a), veh/h	338	1114	1065	2155	0	3079	1189	0	1496	1208	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.0	12.3	12.4	11.6	0.0	6.1	12.5	0.0	6.7	12.2	0.0	0.0
Incr Delay (d2), s/veh	17.1	1.0	1.2	2.5	0.0	0.2	0.1	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	0.0	0.9	0.9	2.1	0.0	0.8	0.3	0.0	0.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	13.4	13.6	14.1	0.0	6.4	12.6	0.0	6.9	12.2	0.0	0.0
LnGrp LOS	C	B	B	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		309			621			252			6	
Approach Delay, s/veh		13.5			10.7			8.0			12.2	
Approach LOS		B			B			A			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.8	13.4	10.9		9.8	4.5	19.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		23.5	41.5	21.5		23.5	6.5	56.5				
Max Q Clear Time (g_c+I1), s		5.0	8.1	4.8		2.1	2.0	5.3				
Green Ext Time (p_c), s		0.9	1.1	1.6		0.0	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay			10.8									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	313	69	332	576	185	53	78	247	219	98	66
Future Volume (veh/h)	34	313	69	332	576	185	53	78	247	219	98	66
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	37	340	75	361	626	201	58	85	268	238	107	72
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	66	782	349	507	872	280	88	651	523	297	1067	476
Arrive On Green	0.04	0.22	0.22	0.15	0.33	0.33	0.05	0.18	0.18	0.17	0.30	0.30
Sat Flow, veh/h	1767	3526	1572	3428	2625	842	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	37	340	75	361	420	407	58	85	268	238	107	72
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1704	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	1.3	5.4	2.5	6.5	13.5	13.6	2.1	1.3	8.9	8.4	1.4	2.2
Cycle Q Clear(g_c), s	1.3	5.4	2.5	6.5	13.5	13.6	2.1	1.3	8.9	8.4	1.4	2.2
Prop In Lane	1.00		1.00	1.00		0.49	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	66	782	349	507	586	566	88	651	523	297	1067	476
V/C Ratio(X)	0.56	0.43	0.21	0.71	0.72	0.72	0.66	0.13	0.51	0.80	0.10	0.15
Avail Cap(c_a), veh/h	205	1496	667	1191	1156	1118	286	1170	754	832	2258	1007
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	30.7	21.7	20.6	26.3	19.0	19.0	30.2	22.1	17.4	25.9	16.3	16.5
Incr Delay (d2), s/veh	7.1	0.4	0.3	1.9	1.7	1.7	8.0	0.1	0.8	5.0	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	0.7	2.1	0.9	2.6	5.3	5.2	1.0	0.5	3.1	3.7	0.5	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	22.1	20.9	28.2	20.6	20.7	38.2	22.2	18.2	30.9	16.3	16.7
LnGrp LOS	D	C	C	C	C	C	D	C	B	C	B	B
Approach Vol, veh/h		452			1188			411			417	
Approach Delay, s/veh		23.2			23.0			21.8			24.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	16.5	14.1	18.9	7.7	24.1	6.9	26.0
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	30.5	21.5	22.5	27.5	10.5	41.5	7.5	42.5
Max Q Clear Time (g_c+I1), s	10.4	10.9	8.5	7.4	4.1	4.2	3.3	15.6
Green Ext Time (p_c), s	0.6	1.1	1.1	2.4	0.0	0.9	0.0	5.9

Intersection Summary		
HCM 6th Ctrl Delay		23.1
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	555	259	319	525	0	0	0	0	575	187	613
Future Volume (veh/h)	0	555	259	319	525	0	0	0	0	575	187	613
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	603	282	347	571	0				414	498	601
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	848	378	451	1507	0				816	857	726
Arrive On Green	0.00	0.24	0.24	0.13	0.43	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	3618	1572	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	603	282	347	571	0				414	498	601
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	12.8	13.5	8.0	9.0	0.0				13.4	16.1	27.1
Cycle Q Clear(g_c), s	0.0	12.8	13.5	8.0	9.0	0.0				13.4	16.1	27.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	848	378	451	1507	0				816	857	726
V/C Ratio(X)	0.00	0.71	0.75	0.77	0.38	0.00				0.51	0.58	0.83
Avail Cap(c_a), veh/h	0	1191	531	737	2144	0				1335	1402	1188
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	28.3	28.6	34.1	15.9	0.0				15.4	16.1	19.1
Incr Delay (d2), s/veh	0.0	1.2	3.6	2.8	0.2	0.0				0.5	0.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.3	5.3	3.4	3.5	0.0				5.1	6.5	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	29.5	32.2	36.9	16.1	0.0				15.9	16.7	21.7
LnGrp LOS	A	C	C	D	B	A				B	B	C
Approach Vol, veh/h		885			918						1513	
Approach Delay, s/veh		30.3			24.0						18.5	
Approach LOS		C			C						B	

Timer - Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			15.2	24.1		42.1		39.3
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			17.5	27.5		61.5		49.5
Max Q Clear Time (g_c+I1), s			10.0	15.5		29.1		11.0
Green Ext Time (p_c), s			0.8	4.1		8.5		4.4

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	462	648	364	611	105	244	114	271	99	118	24
Future Volume (veh/h)	11	462	648	364	611	105	244	114	271	99	118	24
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	502	704	396	664	114	265	124	295	108	128	26
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	26	1385	719	536	1248	214	325	417	599	141	180	37
Arrive On Green	0.01	0.27	0.27	0.16	0.41	0.41	0.18	0.22	0.22	0.08	0.12	0.12
Sat Flow, veh/h	1767	5066	1572	3428	3009	516	1767	1856	1572	1767	1497	304
Grp Volume(v), veh/h	12	502	704	396	389	389	265	124	295	108	0	154
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1763	1767	1856	1572	1767	0	1801
Q Serve(g_s), s	0.5	5.4	18.5	7.5	11.2	11.2	9.7	3.8	9.7	4.1	0.0	5.6
Cycle Q Clear(g_c), s	0.5	5.4	18.5	7.5	11.2	11.2	9.7	3.8	9.7	4.1	0.0	5.6
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	26	1385	719	536	731	731	325	417	599	141	0	217
V/C Ratio(X)	0.46	0.36	0.98	0.74	0.53	0.53	0.82	0.30	0.49	0.77	0.00	0.71
Avail Cap(c_a), veh/h	131	1385	719	1064	899	898	1110	1299	1347	394	0	532
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	0.00	1.00
Uniform Delay (d), s/veh	33.1	19.8	18.0	27.2	14.9	14.9	26.5	21.8	16.0	30.5	0.0	28.6
Incr Delay (d2), s/veh	11.8	0.2	28.3	2.0	0.6	0.6	5.0	0.4	0.6	8.4	0.0	4.2
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	2.0	15.0	3.1	4.2	4.2	4.3	1.6	3.3	2.0	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.8	20.0	46.3	29.3	15.5	15.5	31.5	22.2	16.6	39.0	0.0	32.9
LnGrp LOS	D	B	D	C	B	B	C	C	B	D	A	C
Approach Vol, veh/h		1218			1174			684			262	
Approach Delay, s/veh		35.5			20.1			23.4			35.4	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	19.7	15.1	23.0	17.0	12.7	5.5	32.6
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	15.1	47.4	21.0	18.5	42.5	20.0	5.0	34.5
Max Q Clear Time (g_c+I1), s	16.1	11.7	9.5	20.5	11.7	7.6	2.5	13.2
Green Ext Time (p_c), s	0.2	1.8	1.1	0.0	0.8	0.6	0.0	5.1

Intersection Summary	
HCM 6th Ctrl Delay	27.6
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	376	2	63	0	0	0	119	265	4	14	624	484
Future Volume (veh/h)	376	2	63	0	0	0	119	265	4	14	624	484
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	410	0	68	0	0	0	129	288	4	15	678	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	709	0	315	0	5	0	173	1511	21	34	1219	
Arrive On Green	0.20	0.00	0.20	0.00	0.00	0.00	0.10	0.42	0.42	0.02	0.35	0.00
Sat Flow, veh/h	3534	0	1572	0	1856	0	1767	3560	49	1767	3526	1572
Grp Volume(v), veh/h	410	0	68	0	0	0	129	142	150	15	678	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	0	1856	0	1767	1763	1847	1767	1763	1572
Q Serve(g_s), s	4.0	0.0	1.4	0.0	0.0	0.0	2.7	1.9	1.9	0.3	5.9	0.0
Cycle Q Clear(g_c), s	4.0	0.0	1.4	0.0	0.0	0.0	2.7	1.9	1.9	0.3	5.9	0.0
Prop In Lane	1.00		1.00	0.00		0.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	709	0	315	0	5	0	173	748	784	34	1219	
V/C Ratio(X)	0.58	0.00	0.22	0.00	0.00	0.00	0.75	0.19	0.19	0.44	0.56	
Avail Cap(c_a), veh/h	2561	0	1139	0	880	0	861	2369	2481	256	3530	
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.7	0.0	12.7	0.0	0.0	0.0	16.7	6.8	6.8	18.4	10.1	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.3	0.0	0.0	0.0	6.2	0.1	0.1	8.7	0.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.4	0.0	0.0	0.0	1.2	0.5	0.5	0.2	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	0.0	13.0	0.0	0.0	0.0	22.9	7.0	7.0	27.1	10.5	0.0
LnGrp LOS	B	A	B	A	A	A	C	A	A	C	B	
Approach Vol, veh/h		478			0			421			693	
Approach Delay, s/veh		14.3			0.0			11.8			10.8	
Approach LOS		B						B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	20.6		12.1	8.2	17.6		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	51.0		27.5	18.5	38.0		18.0				
Max Q Clear Time (g_c+I1), s	2.3	3.9		6.0	4.7	7.9		0.0				
Green Ext Time (p_c), s	0.0	1.8		1.7	0.3	5.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		12.1
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	101	133	19	0	89
Future Vol, veh/h	0	101	133	19	0	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	110	145	21	0	97

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	145
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	900
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	900
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	900
HCM Lane V/C Ratio	-	-	-	0.107
HCM Control Delay (s)	-	-	-	9.5
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	84	10	12	114	57	4	0	5	42	1	14
Future Volume (veh/h)	40	84	10	12	114	57	4	0	5	42	1	14
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	43	91	11	13	124	62	4	0	5	46	1	15
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	91	333	40	30	317	269	9	0	11	120	3	109
Arrive On Green	0.05	0.21	0.21	0.02	0.17	0.17	0.01	0.00	0.01	0.07	0.07	0.07
Sat Flow, veh/h	1767	1624	196	1767	1856	1572	735	0	919	1731	38	1572
Grp Volume(v), veh/h	43	0	102	13	124	62	9	0	0	47	0	15
Grp Sat Flow(s),veh/h/ln	1767	0	1820	1767	1856	1572	1653	0	0	1769	0	1572
Q Serve(g_s), s	0.6	0.0	1.2	0.2	1.5	0.9	0.1	0.0	0.0	0.7	0.0	0.2
Cycle Q Clear(g_c), s	0.6	0.0	1.2	0.2	1.5	0.9	0.1	0.0	0.0	0.7	0.0	0.2
Prop In Lane	1.00		0.11	1.00		1.00	0.44		0.56	0.98		1.00
Lane Grp Cap(c), veh/h	91	0	374	30	317	269	20	0	0	123	0	109
V/C Ratio(X)	0.47	0.00	0.27	0.43	0.39	0.23	0.45	0.00	0.00	0.38	0.00	0.14
Avail Cap(c_a), veh/h	1196	0	2921	786	2547	2158	1374	0	0	1881	0	1672
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.9	0.0	8.7	12.6	9.5	9.3	12.7	0.0	0.0	11.5	0.0	11.3
Incr Delay (d2), s/veh	3.8	0.0	0.4	9.2	0.8	0.4	15.0	0.0	0.0	1.9	0.0	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	0.3	0.0	0.3	0.1	0.5	0.2	0.1	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.7	0.0	9.0	21.8	10.3	9.7	27.7	0.0	0.0	13.4	0.0	11.9
LnGrp LOS	B	A	A	C	B	A	C	A	A	B	A	B
Approach Vol, veh/h		145			199			9			62	
Approach Delay, s/veh		11.0			10.9			27.7			13.1	
Approach LOS		B			B			C			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		4.8	4.9	9.8		6.3	5.8	8.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		21.5	11.5	41.5		27.5	17.5	35.5				
Max Q Clear Time (g_c+I1), s		2.1	2.2	3.2		2.7	2.6	3.5				
Green Ext Time (p_c), s		0.0	0.0	0.6		0.2	0.1	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	122	27	43	207	219	163
Future Volume (veh/h)	122	27	43	207	219	163
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	29	47	225	238	177
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	235	209	98	1826	565	404
Arrive On Green	0.13	0.13	0.06	0.52	0.29	0.29
Sat Flow, veh/h	1767	1572	1767	3618	2057	1402
Grp Volume(v), veh/h	133	29	47	225	213	202
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1603
Q Serve(g_s), s	1.8	0.4	0.7	0.8	2.5	2.7
Cycle Q Clear(g_c), s	1.8	0.4	0.7	0.8	2.5	2.7
Prop In Lane	1.00	1.00	1.00			0.87
Lane Grp Cap(c), veh/h	235	209	98	1826	507	462
V/C Ratio(X)	0.57	0.14	0.48	0.12	0.42	0.44
Avail Cap(c_a), veh/h	2570	2287	1474	10050	3247	2953
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	9.9	11.8	3.2	7.4	7.5
Incr Delay (d2), s/veh	2.1	0.3	3.6	0.0	0.6	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	0.6	0.4	0.3	0.1	0.6	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.6	10.2	15.4	3.2	8.0	8.1
LnGrp LOS	B	B	B	A	A	A
Approach Vol, veh/h	162			272	415	
Approach Delay, s/veh	12.2			5.3	8.1	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		17.9		7.9	5.9	11.9
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		73.5		37.5	21.5	47.5
Max Q Clear Time (g_c+I1), s		2.8		3.8	2.7	4.7
Green Ext Time (p_c), s		1.6		0.5	0.1	2.8

Intersection Summary	
HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	599	52	321	549	395	67	95	231	344	107	76
Future Volume (veh/h)	73	599	52	321	549	395	67	95	231	344	107	76
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	79	651	57	349	597	429	73	103	251	374	116	83
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	1198	372	500	1138	751	101	630	510	530	512	434
Arrive On Green	0.06	0.24	0.24	0.15	0.32	0.32	0.06	0.18	0.18	0.15	0.28	0.28
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	79	651	57	349	597	429	73	103	251	374	116	83
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	2.8	7.1	1.8	6.1	8.7	12.4	2.6	1.6	8.1	6.5	3.1	2.6
Cycle Q Clear(g_c), s	2.8	7.1	1.8	6.1	8.7	12.4	2.6	1.6	8.1	6.5	3.1	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	1198	372	500	1138	751	101	630	510	530	512	434
V/C Ratio(X)	0.75	0.54	0.15	0.70	0.52	0.57	0.72	0.16	0.49	0.71	0.23	0.19
Avail Cap(c_a), veh/h	433	2282	709	1328	2090	1175	377	1254	788	1436	1041	883
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	29.3	21.2	19.1	25.7	17.5	11.9	29.3	22.0	17.2	25.4	17.7	17.5
Incr Delay (d2), s/veh	10.4	0.4	0.2	1.8	0.4	0.7	9.4	0.1	0.7	1.7	0.2	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	1.4	2.7	0.6	2.5	3.3	3.9	1.3	0.6	2.8	2.6	1.2	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.7	21.5	19.3	27.5	17.8	12.6	38.7	22.1	17.9	27.1	17.9	17.7
LnGrp LOS	D	C	B	C	B	B	D	C	B	C	B	B
Approach Vol, veh/h		787			1375			427			573	
Approach Delay, s/veh		23.2			18.6			22.5			23.9	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	15.8	13.7	19.5	8.1	22.0	8.3	24.9
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	26.5	22.5	24.5	28.5	13.5	35.5	15.5	37.5
Max Q Clear Time (g_c+I1), s	8.5	10.1	8.1	9.1	4.6	5.1	4.8	14.4
Green Ext Time (p_c), s	1.2	1.2	1.1	4.6	0.1	0.9	0.1	6.0

Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	5	125	5	255	43	1545	119	198	1335	6
Future Volume (veh/h)	3	1	5	125	5	255	43	1545	119	198	1335	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	3	1	5	136	5	277	47	1679	129	215	1451	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	43	26	33	180	4	264	61	1900	145	246	2435	12
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.03	0.57	0.57	0.14	0.68	0.68
Sat Flow, veh/h	0	157	196	695	26	1572	1767	3320	253	1767	3598	17
Grp Volume(v), veh/h	9	0	0	141	0	277	47	884	924	215	711	747
Grp Sat Flow(s),veh/h/ln	353	0	0	720	0	1572	1767	1763	1810	1767	1763	1852
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	18.7	2.9	48.0	49.8	13.3	24.3	24.4
Cycle Q Clear(g_c), s	18.7	0.0	0.0	18.7	0.0	18.7	2.9	48.0	49.8	13.3	24.3	24.4
Prop In Lane	0.33		0.56	0.96		1.00	1.00		0.14	1.00		0.01
Lane Grp Cap(c), veh/h	102	0	0	184	0	264	61	1009	1036	246	1193	1254
V/C Ratio(X)	0.09	0.00	0.00	0.77	0.00	1.05	0.77	0.88	0.89	0.87	0.60	0.60
Avail Cap(c_a), veh/h	102	0	0	184	0	264	141	1080	1109	309	1247	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	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	0.0	0.0	47.7	0.0	46.4	53.4	20.5	20.9	47.0	9.8	9.8
Incr Delay (d2), s/veh	0.4	0.0	0.0	17.3	0.0	69.2	18.5	7.9	9.0	19.8	0.7	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	0.2	0.0	0.0	4.8	0.0	12.3	1.6	20.6	22.2	7.2	8.7	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.2	0.0	0.0	65.1	0.0	115.6	71.9	28.4	29.8	66.8	10.5	10.4
LnGrp LOS	D	A	A	E	A	F	E	C	C	E	B	B
Approach Vol, veh/h		9			418			1855			1673	
Approach Delay, s/veh		40.2			98.6			30.2			17.7	
Approach LOS		D			F			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.0	68.3		23.2	8.3	80.0		23.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	19.5	68.3		18.7	8.9	78.9		18.7				
Max Q Clear Time (g_c+I1), s	15.3	51.8		20.7	4.9	26.4		20.7				
Green Ext Time (p_c), s	0.2	12.0		0.0	0.0	15.9		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			32.2									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	285	7	33	377	67	9	5	32	74	5	35
Future Vol, veh/h	30	285	7	33	377	67	9	5	32	74	5	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	33	310	8	36	410	73	10	5	35	80	5	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	483	0	0	318	0	0	920	935	314	919	903	447
Stage 1	-	-	-	-	-	-	380	380	-	519	519	-
Stage 2	-	-	-	-	-	-	540	555	-	400	384	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1074	-	-	1236	-	-	250	264	724	251	276	609
Stage 1	-	-	-	-	-	-	640	612	-	538	531	-
Stage 2	-	-	-	-	-	-	524	512	-	624	610	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1074	-	-	1236	-	-	219	247	724	223	258	609
Mov Cap-2 Maneuver	-	-	-	-	-	-	219	247	-	223	258	-
Stage 1	-	-	-	-	-	-	616	589	-	518	516	-
Stage 2	-	-	-	-	-	-	472	497	-	567	587	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.6	14.3	27.8
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	436	1074	-	-	1236	-	-	279
HCM Lane V/C Ratio	0.115	0.03	-	-	0.029	-	-	0.444
HCM Control Delay (s)	14.3	8.5	0	-	8	-	-	27.8
HCM Lane LOS	B	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	285	112	460	333	177	118	60	431	200	37	39
Future Volume (veh/h)	29	285	112	460	333	177	118	60	431	200	37	39
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	32	310	122	500	362	192	128	65	468	217	40	42
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	394	152	545	498	264	431	206	1085	282	52	43
Arrive On Green	0.03	0.16	0.16	0.31	0.44	0.44	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1767	2487	959	1767	1141	605	954	540	1572	555	137	113
Grp Volume(v), veh/h	32	218	214	500	0	554	193	0	468	299	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1683	1767	0	1747	1494	0	1572	806	0	0
Q Serve(g_s), s	1.6	10.5	10.9	24.3	0.0	23.3	0.0	0.0	11.7	24.9	0.0	0.0
Cycle Q Clear(g_c), s	1.6	10.5	10.9	24.3	0.0	23.3	7.9	0.0	11.7	32.9	0.0	0.0
Prop In Lane	1.00		0.57	1.00		0.35	0.66		1.00	0.73		0.14
Lane Grp Cap(c), veh/h	54	279	267	545	0	761	637	0	1085	377	0	0
V/C Ratio(X)	0.59	0.78	0.80	0.92	0.00	0.73	0.30	0.00	0.43	0.79	0.00	0.00
Avail Cap(c_a), veh/h	117	359	343	686	0	918	637	0	1085	377	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.5	35.9	36.1	29.7	0.0	20.7	19.4	0.0	6.1	30.1	0.0	0.0
Incr Delay (d2), s/veh	9.8	8.1	10.2	15.1	0.0	2.3	0.3	0.0	0.3	11.0	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	0.8	5.1	5.1	12.2	0.0	9.5	2.8	0.0	3.3	7.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.3	44.0	46.2	44.7	0.0	23.0	19.6	0.0	6.4	41.1	0.0	0.0
LnGrp LOS	D	D	D	D	A	C	B	A	A	D	A	A
Approach Vol, veh/h		464			1054			661			299	
Approach Delay, s/veh		45.6			33.3			10.2			41.1	
Approach LOS		D			C			B			D	

Timer - Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		38.4	31.9	18.6		38.4	7.2	43.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.9	34.5	18.1		33.9	5.9	46.7
Max Q Clear Time (g_c+I1), s		13.7	26.3	12.9		34.9	3.6	25.3
Green Ext Time (p_c), s		2.9	1.1	1.2		0.0	0.0	3.9

Intersection Summary			
HCM 6th Ctrl Delay			30.4
HCM 6th LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	1084	202	465	1260	420	90	246	458	287	245	51
Future Volume (veh/h)	66	1084	202	465	1260	420	90	246	458	287	245	51
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	1178	220	505	1370	457	98	267	498	312	266	55
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	81	1296	578	540	1259	402	122	573	503	287	902	402
Arrive On Green	0.05	0.37	0.37	0.16	0.48	0.48	0.07	0.16	0.16	0.16	0.26	0.26
Sat Flow, veh/h	1767	3526	1572	3428	2628	840	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	72	1178	220	505	899	928	98	267	498	312	266	55
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1704	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	4.9	38.1	12.3	17.5	57.5	57.5	6.6	8.2	19.5	19.5	7.3	3.2
Cycle Q Clear(g_c), s	4.9	38.1	12.3	17.5	57.5	57.5	6.6	8.2	19.5	19.5	7.3	3.2
Prop In Lane	1.00		1.00	1.00		0.49	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	1296	578	540	845	817	122	573	503	287	902	402
V/C Ratio(X)	0.89	0.91	0.38	0.94	1.06	1.14	0.80	0.47	0.99	1.09	0.29	0.14
Avail Cap(c_a), veh/h	81	1296	578	540	845	817	196	573	503	287	902	402
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	56.9	36.0	27.9	49.9	31.3	31.3	55.0	45.5	40.6	50.2	35.9	34.4
Incr Delay (d2), s/veh	64.3	9.7	0.4	23.8	49.7	76.0	11.4	0.6	37.3	78.1	0.2	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	3.6	17.8	4.7	9.2	35.1	39.9	3.3	3.7	19.6	14.8	3.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	121.2	45.7	28.3	73.8	80.9	107.2	66.4	46.1	77.9	128.4	36.1	34.6
LnGrp LOS	F	D	C	E	F	F	E	D	E	F	D	C
Approach Vol, veh/h		1470			2332			863			633	
Approach Delay, s/veh		46.8			89.8			66.8			81.5	
Approach LOS		D			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	24.0	23.4	48.6	12.8	35.2	10.0	62.0
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	19.5	18.9	44.1	13.3	25.7	5.5	57.5
Max Q Clear Time (g_c+I1), s	21.5	21.5	19.5	40.1	8.6	9.3	6.9	59.5
Green Ext Time (p_c), s	0.0	0.0	0.0	2.9	0.1	1.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	73.1
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1164	665	124	1098	0	0	0	0	1246	202	204
Future Volume (veh/h)	0	1164	665	124	1098	0	0	0	0	1246	202	204
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1265	723	135	1193	0				1511	0	157
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1321	589	162	1625	0				1631	0	726
Arrive On Green	0.00	0.37	0.37	0.05	0.46	0.00				0.46	0.00	0.46
Sat Flow, veh/h	0	3618	1572	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1265	723	135	1193	0				1511	0	157
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	40.6	43.5	4.5	32.0	0.0				46.7	0.0	6.9
Cycle Q Clear(g_c), s	0.0	40.6	43.5	4.5	32.0	0.0				46.7	0.0	6.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1321	589	162	1625	0				1631	0	726
V/C Ratio(X)	0.00	0.96	1.23	0.83	0.73	0.00				0.93	0.00	0.22
Avail Cap(c_a), veh/h	0	1321	589	162	1625	0				1751	0	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.4	36.3	54.8	25.5	0.0				29.4	0.0	18.7
Incr Delay (d2), s/veh	0.0	15.7	116.5	29.0	1.8	0.0				8.6	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
%ile BackOfQ(50%),veh/ln	0.0	19.9	35.3	2.6	13.5	0.0				21.1	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	51.1	152.8	83.8	27.2	0.0				38.0	0.0	18.8
LnGrp LOS	A	D	F	F	C	A				D	A	B
Approach Vol, veh/h		1988			1328						1668	
Approach Delay, s/veh		88.1			33.0						36.2	
Approach LOS		F			C						D	

Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	48.0		58.1		58.0				
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s			5.5	43.5		57.5		53.5				
Max Q Clear Time (g_c+I1), s			6.5	45.5		48.7		34.0				
Green Ext Time (p_c), s			0.0	0.0		4.9		8.9				

Intersection Summary		
HCM 6th Ctrl Delay		56.0
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	722	819	365	434	112	761	173	601	194	271	27
Future Volume (veh/h)	15	722	819	365	434	112	761	173	601	194	271	27
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	16	785	890	397	472	122	827	188	653	211	295	29
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	30	760	885	357	658	169	729	852	886	241	305	30
Arrive On Green	0.02	0.15	0.15	0.10	0.24	0.24	0.41	0.46	0.46	0.14	0.18	0.18
Sat Flow, veh/h	1767	5066	1572	3428	2777	713	1767	1856	1572	1767	1663	163
Grp Volume(v), veh/h	16	785	890	397	298	296	827	188	653	211	0	324
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1727	1767	1856	1572	1767	0	1826
Q Serve(g_s), s	1.1	18.0	18.0	12.5	18.7	18.9	49.5	7.3	37.2	14.0	0.0	21.1
Cycle Q Clear(g_c), s	1.1	18.0	18.0	12.5	18.7	18.9	49.5	7.3	37.2	14.0	0.0	21.1
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	30	760	885	357	418	409	729	852	886	241	0	335
V/C Ratio(X)	0.53	1.03	1.01	1.11	0.71	0.72	1.13	0.22	0.74	0.87	0.00	0.97
Avail Cap(c_a), veh/h	75	760	885	357	418	409	729	852	886	353	0	335
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	0.00	1.00
Uniform Delay (d), s/veh	58.5	51.0	26.3	53.8	42.1	42.1	35.3	19.5	19.6	50.8	0.0	48.6
Incr Delay (d2), s/veh	13.3	41.5	31.8	81.3	5.7	6.1	76.9	0.1	3.3	15.1	0.0	40.5
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	0.6	10.5	31.4	9.4	8.8	8.7	36.3	3.2	13.8	7.2	0.0	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.8	92.5	58.0	135.0	47.8	48.3	112.2	19.7	22.8	65.9	0.0	89.1
LnGrp LOS	E	F	F	F	D	D	F	B	C	E	A	F
Approach Vol, veh/h		1691			991			1668			535	
Approach Delay, s/veh		74.1			82.9			66.8			79.9	
Approach LOS		E			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.9	59.6	17.0	22.5	54.0	26.5	6.6	32.9
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	24.0	47.5	12.5	18.0	49.5	22.0	5.1	25.4
Max Q Clear Time (g_c+I1), s	16.0	39.2	14.5	20.0	51.5	23.1	3.1	20.9
Green Ext Time (p_c), s	0.4	2.6	0.0	0.0	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	74.0
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	830	2	57	4	2	13	469	692	1	8	733	714
Future Volume (veh/h)	830	2	57	4	2	13	469	692	1	8	733	714
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	903	0	62	4	2	14	510	752	1	9	797	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	966	0	430	7	3	24	492	1874	2	19	886	
Arrive On Green	0.27	0.00	0.27	0.02	0.02	0.02	0.28	0.52	0.52	0.01	0.25	0.00
Sat Flow, veh/h	3534	0	1572	327	163	1143	1767	3613	5	1767	3526	1572
Grp Volume(v), veh/h	903	0	62	20	0	0	510	367	386	9	797	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	1633	0	0	1767	1763	1855	1767	1763	1572
Q Serve(g_s), s	25.5	0.0	3.1	1.2	0.0	0.0	28.5	13.0	13.0	0.5	22.4	0.0
Cycle Q Clear(g_c), s	25.5	0.0	3.1	1.2	0.0	0.0	28.5	13.0	13.0	0.5	22.4	0.0
Prop In Lane	1.00		1.00	0.20		0.70	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	966	0	430	35	0	0	492	914	962	19	886	
V/C Ratio(X)	0.93	0.00	0.14	0.58	0.00	0.00	1.04	0.40	0.40	0.46	0.90	
Avail Cap(c_a), veh/h	984	0	438	287	0	0	492	914	962	86	930	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.3	0.0	28.1	49.7	0.0	0.0	36.9	15.0	15.0	50.3	37.1	0.0
Incr Delay (d2), s/veh	15.3	0.0	0.2	14.3	0.0	0.0	50.4	0.3	0.3	16.1	11.3	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	0.0	1.2	0.6	0.0	0.0	18.9	5.1	5.3	0.3	10.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.6	0.0	28.3	64.0	0.0	0.0	87.4	15.3	15.3	66.4	48.4	0.0
LnGrp LOS	D	A	C	E	A	A	F	B	B	E	D	
Approach Vol, veh/h		965			20			1263			806	
Approach Delay, s/veh		50.1			64.0			44.4			48.6	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	57.6		32.5	33.0	30.2		6.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	50.5		28.5	28.5	27.0		18.0
Max Q Clear Time (g_c+I1), s	2.5	15.0		27.5	30.5	24.4		3.2
Green Ext Time (p_c), s	0.0	5.4		0.5	0.0	1.3		0.0

Intersection Summary	
HCM 6th Ctrl Delay	47.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2.4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	222	67	24	0	109
Future Vol, veh/h	0	222	67	24	0	109
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	241	73	26	0	118

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	73
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	986
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	986
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	986
HCM Lane V/C Ratio	-	-	-	0.12
HCM Control Delay (s)	-	-	-	9.1
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	154	5	2	66	96	12	4	22	90	1	25
Future Volume (veh/h)	68	154	5	2	66	96	12	4	22	90	1	25
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	74	167	5	2	72	104	13	4	24	98	1	27
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	136	418	13	6	295	250	25	8	47	191	2	171
Arrive On Green	0.08	0.23	0.23	0.00	0.16	0.16	0.05	0.05	0.05	0.11	0.11	0.11
Sat Flow, veh/h	1767	1792	54	1767	1856	1572	525	161	969	1750	18	1572
Grp Volume(v), veh/h	74	0	172	2	72	104	41	0	0	99	0	27
Grp Sat Flow(s),veh/h/ln	1767	0	1846	1767	1856	1572	1655	0	0	1768	0	1572
Q Serve(g_s), s	1.2	0.0	2.3	0.0	1.0	1.8	0.7	0.0	0.0	1.6	0.0	0.5
Cycle Q Clear(g_c), s	1.2	0.0	2.3	0.0	1.0	1.8	0.7	0.0	0.0	1.6	0.0	0.5
Prop In Lane	1.00		0.03	1.00		1.00	0.32		0.59	0.99		1.00
Lane Grp Cap(c), veh/h	136	0	431	6	295	250	80	0	0	192	0	171
V/C Ratio(X)	0.54	0.00	0.40	0.34	0.24	0.42	0.51	0.00	0.00	0.51	0.00	0.16
Avail Cap(c_a), veh/h	1221	0	2458	506	1720	1458	1423	0	0	1699	0	1511
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	9.6	14.8	10.9	11.2	13.8	0.0	0.0	12.5	0.0	12.0
Incr Delay (d2), s/veh	3.4	0.0	0.6	30.0	0.4	1.1	5.0	0.0	0.0	2.1	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	0.5	0.0	0.7	0.1	0.3	0.5	0.3	0.0	0.0	0.6	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	0.0	10.2	44.7	11.3	12.3	18.8	0.0	0.0	14.6	0.0	12.4
LnGrp LOS	B	A	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		246			178			41			126	
Approach Delay, s/veh		12.1			12.3			18.8			14.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		5.9	4.6	11.4		7.7	6.8	9.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		25.5	8.5	39.5		28.5	20.5	27.5
Max Q Clear Time (g_c+I1), s		2.7	2.0	4.3		3.6	3.2	3.8
Green Ext Time (p_c), s		0.1	0.0	1.0		0.6	0.1	0.7

Intersection Summary			
HCM 6th Ctrl Delay			13.1
HCM 6th LOS			B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	181	65	71	479	656	129
Future Volume (veh/h)	181	65	71	479	656	129
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	197	71	77	521	713	140
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	295	262	128	2119	1212	238
Arrive On Green	0.17	0.17	0.07	0.60	0.41	0.41
Sat Flow, veh/h	1767	1572	1767	3618	3031	577
Grp Volume(v), veh/h	197	71	77	521	428	425
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1752
Q Serve(g_s), s	4.1	1.5	1.6	2.7	7.3	7.3
Cycle Q Clear(g_c), s	4.1	1.5	1.6	2.7	7.3	7.3
Prop In Lane	1.00	1.00	1.00			0.33
Lane Grp Cap(c), veh/h	295	262	128	2119	727	722
V/C Ratio(X)	0.67	0.27	0.60	0.25	0.59	0.59
Avail Cap(c_a), veh/h	1481	1318	797	7136	2568	2552
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	15.2	14.1	17.4	3.6	8.8	8.8
Incr Delay (d2), s/veh	2.6	0.5	4.4	0.1	0.8	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	1.6	1.4	0.7	0.4	2.1	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.8	14.6	21.9	3.7	9.6	9.6
LnGrp LOS	B	B	C	A	A	A
Approach Vol, veh/h	268			598	853	
Approach Delay, s/veh	16.9			6.0	9.6	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		27.8		11.0	7.3	20.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		78.5		32.5	17.5	56.5
Max Q Clear Time (g_c+I1), s		4.7		6.1	3.6	9.3
Green Ext Time (p_c), s		4.1		0.8	0.1	6.7

Intersection Summary		
HCM 6th Ctrl Delay		9.5
HCM 6th LOS		A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	1102	130	376	950	716	92	183	421	648	233	139
Future Volume (veh/h)	66	1102	130	376	950	716	92	183	421	648	233	139
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	1198	141	409	1033	778	100	199	458	704	253	151
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	92	1529	475	478	1373	974	125	603	488	788	612	519
Arrive On Green	0.05	0.30	0.30	0.14	0.39	0.39	0.07	0.17	0.17	0.23	0.33	0.33
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	72	1198	141	409	1033	778	100	199	458	704	253	151
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	4.6	24.7	7.8	13.3	28.9	42.5	6.4	5.7	19.5	22.7	12.1	8.1
Cycle Q Clear(g_c), s	4.6	24.7	7.8	13.3	28.9	42.5	6.4	5.7	19.5	22.7	12.1	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	92	1529	475	478	1373	974	125	603	488	788	612	519
V/C Ratio(X)	0.78	0.78	0.30	0.85	0.75	0.80	0.80	0.33	0.94	0.89	0.41	0.29
Avail Cap(c_a), veh/h	118	1529	475	586	1373	974	209	603	488	917	612	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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.4	36.4	30.5	47.9	30.1	16.4	52.2	41.5	38.2	42.6	29.6	28.3
Incr Delay (d2), s/veh	22.5	2.7	0.3	10.1	2.4	4.8	10.9	0.3	26.0	10.1	0.4	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	10.4	3.0	6.3	12.5	15.4	3.2	2.5	15.8	10.6	5.5	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.9	39.1	30.9	58.0	32.5	21.2	63.1	41.8	64.2	52.7	30.1	28.6
LnGrp LOS	E	D	C	E	C	C	E	D	E	D	C	C
Approach Vol, veh/h		1411			2220			757			1108	
Approach Delay, s/veh		40.2			33.2			58.2			44.2	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.7	24.0	20.4	38.9	12.6	42.1	10.4	48.9
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	30.5	19.5	19.5	32.5	13.5	36.5	7.6	44.4
Max Q Clear Time (g_c+I1), s	24.7	21.5	15.3	26.7	8.4	14.1	6.6	44.5
Green Ext Time (p_c), s	1.5	0.0	0.6	3.9	0.1	2.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	40.7
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	5	125	5	245	46	1653	120	192	1428	6
Future Volume (veh/h)	3	1	5	125	5	245	46	1653	120	192	1428	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	3	1	5	136	5	266	50	1797	130	209	1552	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	41	25	32	172	4	248	64	1973	141	237	2480	11
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.04	0.59	0.59	0.13	0.69	0.69
Sat Flow, veh/h	0	160	200	699	26	1572	1767	3337	239	1767	3599	16
Grp Volume(v), veh/h	9	0	0	141	0	266	50	939	988	209	760	799
Grp Sat Flow(s),veh/h/ln	360	0	0	725	0	1572	1767	1763	1813	1767	1763	1853
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	18.3	3.2	54.0	56.7	13.4	27.3	27.3
Cycle Q Clear(g_c), s	18.3	0.0	0.0	18.3	0.0	18.3	3.2	54.0	56.7	13.4	27.3	27.3
Prop In Lane	0.33		0.56	0.96		1.00	1.00		0.13	1.00		0.01
Lane Grp Cap(c), veh/h	98	0	0	176	0	248	64	1042	1071	237	1215	1276
V/C Ratio(X)	0.09	0.00	0.00	0.80	0.00	1.07	0.78	0.90	0.92	0.88	0.63	0.63
Avail Cap(c_a), veh/h	98	0	0	176	0	248	139	1076	1107	267	1215	1276
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	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	0.0	0.0	50.5	0.0	48.8	55.3	20.7	21.3	49.2	9.8	9.8
Incr Delay (d2), s/veh	0.4	0.0	0.0	22.9	0.0	77.0	17.9	10.3	12.2	25.2	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	0.0	5.2	0.0	12.5	1.8	23.6	25.9	7.6	9.9	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	0.0	0.0	73.4	0.0	125.8	73.2	31.0	33.5	74.4	10.9	10.8
LnGrp LOS	D	A	A	E	A	F	E	C	C	E	B	B
Approach Vol, veh/h		9			407			1977			1768	
Approach Delay, s/veh		42.6			107.6			33.3			18.4	
Approach LOS		D			F			C			B	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	20.0	73.0	22.8	8.7	84.3	22.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	17.5	70.7	18.3	9.1	79.1	18.3
Max Q Clear Time (g_c+I1), s	15.4	58.7	20.3	5.2	29.3	20.3
Green Ext Time (p_c), s	0.1	9.8	0.0	0.0	17.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	34.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	279	6	29	369	72	7	5	24	79	5	37
Future Vol, veh/h	32	279	6	29	369	72	7	5	24	79	5	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	35	303	7	32	401	78	8	5	26	86	5	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	479	0	0	310	0	0	904	920	307	896	884	440
Stage 1	-	-	-	-	-	-	377	377	-	504	504	-
Stage 2	-	-	-	-	-	-	527	543	-	392	380	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1078	-	-	1245	-	-	257	270	731	260	283	615
Stage 1	-	-	-	-	-	-	642	614	-	548	539	-
Stage 2	-	-	-	-	-	-	533	518	-	631	612	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1078	-	-	1245	-	-	225	253	731	235	265	615
Mov Cap-2 Maneuver	-	-	-	-	-	-	225	253	-	235	265	-
Stage 1	-	-	-	-	-	-	617	590	-	527	525	-
Stage 2	-	-	-	-	-	-	480	505	-	579	588	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.5	14.2	27.2
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	430	1078	-	-	1245	-	-	291
HCM Lane V/C Ratio	0.091	0.032	-	-	0.025	-	-	0.452
HCM Control Delay (s)	14.2	8.5	0	-	8	-	-	27.2
HCM Lane LOS	B	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-	-	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	294	94	354	350	189	92	61	288	214	36	42
Future Volume (veh/h)	31	294	94	354	350	189	92	61	288	214	36	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	34	320	102	385	380	205	100	66	313	233	39	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	61	463	145	444	445	240	412	252	993	342	59	53
Arrive On Green	0.03	0.18	0.18	0.25	0.39	0.39	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1767	2642	828	1767	1134	612	867	665	1572	666	154	139
Grp Volume(v), veh/h	34	212	210	385	0	585	166	0	313	318	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1707	1767	0	1745	1532	0	1572	959	0	0
Q Serve(g_s), s	1.3	7.9	8.1	14.6	0.0	21.4	0.0	0.0	6.4	17.5	0.0	0.0
Cycle Q Clear(g_c), s	1.3	7.9	8.1	14.6	0.0	21.4	5.0	0.0	6.4	22.5	0.0	0.0
Prop In Lane	1.00		0.48	1.00		0.35	0.60		1.00	0.73		0.14
Lane Grp Cap(c), veh/h	61	309	299	444	0	685	664	0	993	454	0	0
V/C Ratio(X)	0.56	0.68	0.70	0.87	0.00	0.85	0.25	0.00	0.32	0.70	0.00	0.00
Avail Cap(c_a), veh/h	139	467	452	747	0	1063	918	0	1263	645	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.2	27.0	27.1	25.0	0.0	19.4	14.9	0.0	5.9	22.0	0.0	0.0
Incr Delay (d2), s/veh	7.7	2.7	3.0	5.8	0.0	4.3	0.2	0.0	0.2	2.0	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	0.7	3.4	3.4	6.4	0.0	8.6	1.7	0.0	1.7	4.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.9	29.7	30.1	30.8	0.0	23.7	15.1	0.0	6.1	23.9	0.0	0.0
LnGrp LOS	D	C	C	C	A	C	B	A	A	C	A	A
Approach Vol, veh/h		456			970			479			318	
Approach Delay, s/veh		30.7			26.5			9.2			23.9	
Approach LOS		C			C			A			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		31.0	22.1	16.7		31.0	6.9	31.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		38.5	29.5	18.5		38.5	5.5	42.5				
Max Q Clear Time (g_c+I1), s		8.4	16.6	10.1		24.5	3.3	23.4				
Green Ext Time (p_c), s		2.2	1.0	1.6		2.0	0.0	4.0				
Intersection Summary												
HCM 6th Ctrl Delay			23.3									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	981	216	486	1207	449	96	263	473	307	262	51
Future Volume (veh/h)	66	981	216	486	1207	449	96	263	473	307	262	51
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	1066	235	528	1312	488	104	286	514	334	285	55
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	74	1199	535	563	1179	419	129	617	533	302	962	429
Arrive On Green	0.04	0.34	0.34	0.16	0.46	0.46	0.07	0.17	0.17	0.17	0.27	0.27
Sat Flow, veh/h	1767	3526	1572	3428	2549	906	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	72	1066	235	528	889	911	104	286	514	334	285	55
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1692	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	4.9	34.3	13.9	18.3	55.5	55.5	7.0	8.7	21.0	20.5	7.7	3.2
Cycle Q Clear(g_c), s	4.9	34.3	13.9	18.3	55.5	55.5	7.0	8.7	21.0	20.5	7.7	3.2
Prop In Lane	1.00		1.00	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	74	1199	535	563	815	783	129	617	533	302	962	429
V/C Ratio(X)	0.98	0.89	0.44	0.94	1.09	1.16	0.81	0.46	0.96	1.11	0.30	0.13
Avail Cap(c_a), veh/h	74	1199	535	563	815	783	202	617	533	302	962	429
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	57.4	37.5	30.7	49.5	32.3	32.3	54.8	44.4	38.9	49.8	34.5	32.9
Incr Delay (d2), s/veh	97.0	8.5	0.6	23.7	59.0	87.6	12.2	0.5	29.9	83.4	0.2	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	4.2	16.0	5.4	9.6	36.1	40.9	3.5	3.9	19.0	16.0	3.3	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	154.5	46.0	31.3	73.2	91.2	119.9	67.0	45.0	68.8	133.2	34.7	33.0
LnGrp LOS	F	D	C	E	F	F	E	D	E	F	C	C
Approach Vol, veh/h		1373			2328			904			674	
Approach Delay, s/veh		49.2			98.3			61.1			83.4	
Approach LOS		D			F			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.0	25.5	24.2	45.3	13.3	37.2	9.5	60.0				
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	20.5	21.0	19.7	40.8	13.7	27.8	5.0	55.5				
Max Q Clear Time (g_c+I1), s	22.5	23.0	20.3	36.3	9.0	9.7	6.9	57.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	3.0	0.1	1.8	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			77.3									
HCM 6th LOS			E									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1118	643	133	1089	0	0	0	0	1333	216	151
Future Volume (veh/h)	0	1118	643	133	1089	0	0	0	0	1333	216	151
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1215	699	145	1184	0				1617	0	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1221	544	173	1534	0				1724	0	767
Arrive On Green	0.00	0.35	0.35	0.05	0.44	0.00				0.49	0.00	0.49
Sat Flow, veh/h	0	3618	1572	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1215	699	145	1184	0				1617	0	99
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	40.2	40.5	4.9	33.4	0.0				50.5	0.0	4.0
Cycle Q Clear(g_c), s	0.0	40.2	40.5	4.9	33.4	0.0				50.5	0.0	4.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1221	544	173	1534	0				1724	0	767
V/C Ratio(X)	0.00	1.00	1.28	0.84	0.77	0.00				0.94	0.00	0.13
Avail Cap(c_a), veh/h	0	1221	544	173	1534	0				1816	0	808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	38.1	38.2	55.1	28.1	0.0				28.3	0.0	16.4
Incr Delay (d2), s/veh	0.0	24.6	141.3	28.9	2.5	0.0				9.7	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
%ile BackOfQ(50%),veh/ln	0.0	21.2	36.7	2.8	14.3	0.0				22.8	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	62.7	179.5	83.9	30.6	0.0				37.9	0.0	16.4
LnGrp LOS	A	E	F	F	C	A				D	A	B
Approach Vol, veh/h		1914			1329						1716	
Approach Delay, s/veh		105.4			36.4						36.7	
Approach LOS		F			D						D	

Timer - Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			10.4	45.0		61.6		55.4
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			5.9	40.5		60.1		50.9
Max Q Clear Time (g_c+I1), s			6.9	42.5		52.5		35.4
Green Ext Time (p_c), s			0.0	0.0		4.6		7.7

Intersection Summary	
HCM 6th Ctrl Delay	63.1
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	739	782	391	438	120	755	185	643	208	290	29
Future Volume (veh/h)	16	739	782	391	438	120	755	185	643	208	290	29
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	17	803	850	425	476	130	821	201	699	226	315	32
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	32	760	858	386	670	182	700	820	872	257	318	32
Arrive On Green	0.02	0.15	0.15	0.11	0.24	0.24	0.40	0.44	0.44	0.15	0.19	0.19
Sat Flow, veh/h	1767	5066	1572	3428	2741	744	1767	1856	1572	1767	1657	168
Grp Volume(v), veh/h	17	803	850	425	305	301	821	201	699	226	0	347
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1722	1767	1856	1572	1767	0	1825
Q Serve(g_s), s	1.1	18.0	18.0	13.5	19.0	19.2	47.5	8.1	42.8	15.0	0.0	22.8
Cycle Q Clear(g_c), s	1.1	18.0	18.0	13.5	19.0	19.2	47.5	8.1	42.8	15.0	0.0	22.8
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	32	760	858	386	431	421	700	820	872	257	0	350
V/C Ratio(X)	0.53	1.06	0.99	1.10	0.71	0.72	1.17	0.24	0.80	0.88	0.00	0.99
Avail Cap(c_a), veh/h	75	760	858	386	431	421	700	820	872	378	0	350
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	0.00	1.00
Uniform Delay (d), s/veh	58.4	51.0	26.9	53.3	41.4	41.5	36.3	20.9	21.4	50.3	0.0	48.4
Incr Delay (d2), s/veh	13.2	48.7	28.2	76.2	5.3	5.7	92.8	0.2	5.4	14.8	0.0	45.8
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	0.6	11.0	29.4	9.9	8.9	8.8	38.0	3.6	16.3	7.7	0.0	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	99.7	55.2	129.5	46.7	47.2	129.1	21.1	26.8	65.1	0.0	94.2
LnGrp LOS	E	F	E	F	D	D	F	C	C	E	A	F
Approach Vol, veh/h		1670			1031			1721			573	
Approach Delay, s/veh		76.7			81.0			74.9			82.7	
Approach LOS		E			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.9	57.6	18.0	22.5	52.0	27.5	6.7	33.8
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	25.7	44.8	13.5	18.0	47.5	23.0	5.1	26.4
Max Q Clear Time (g_c+I1), s	17.0	44.8	15.5	20.0	49.5	24.8	3.1	21.2
Green Ext Time (p_c), s	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	77.7
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	835	2	61	4	2	14	502	734	1	9	777	677
Future Volume (veh/h)	835	2	61	4	2	14	502	734	1	9	777	677
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	909	0	66	4	2	15	546	798	1	10	845	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	934	0	416	7	3	25	501	1910	2	21	906	
Arrive On Green	0.26	0.00	0.26	0.02	0.02	0.02	0.28	0.53	0.53	0.01	0.26	0.00
Sat Flow, veh/h	3534	0	1572	311	155	1165	1767	3613	5	1767	3526	1572
Grp Volume(v), veh/h	909	0	66	21	0	0	546	389	410	10	845	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	1630	0	0	1767	1763	1855	1767	1763	1572
Q Serve(g_s), s	26.5	0.0	3.4	1.3	0.0	0.0	29.5	13.9	13.9	0.6	24.4	0.0
Cycle Q Clear(g_c), s	26.5	0.0	3.4	1.3	0.0	0.0	29.5	13.9	13.9	0.6	24.4	0.0
Prop In Lane	1.00		1.00	0.19		0.71	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	934	0	416	36	0	0	501	932	980	21	906	
V/C Ratio(X)	0.97	0.00	0.16	0.59	0.00	0.00	1.09	0.42	0.42	0.47	0.93	
Avail Cap(c_a), veh/h	934	0	416	282	0	0	501	932	980	85	915	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.9	0.0	29.4	50.4	0.0	0.0	37.3	14.8	14.8	51.0	37.8	0.0
Incr Delay (d2), s/veh	22.9	0.0	0.2	14.5	0.0	0.0	66.6	0.3	0.3	15.2	15.9	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	0.0	1.3	0.7	0.0	0.0	21.8	5.4	5.7	0.3	12.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	0.0	29.5	64.9	0.0	0.0	103.9	15.1	15.1	66.2	53.6	0.0
LnGrp LOS	E	A	C	E	A	A	F	B	B	E	D	
Approach Vol, veh/h		975			21			1345			855	
Approach Delay, s/veh		58.7			64.9			51.2			53.8	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	5.8	59.5	32.0	34.0	31.2	6.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	51.5	27.5	29.5	27.0	18.0
Max Q Clear Time (g_c+I1), s	2.6	15.9	28.5	31.5	26.4	3.3
Green Ext Time (p_c), s	0.0	5.8	0.0	0.0	0.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	54.2
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	1.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	204	72	11	0	62
Future Vol, veh/h	0	204	72	11	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	222	78	12	0	67

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	78
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	980
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	980
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	980
HCM Lane V/C Ratio	-	-	-	0.069
HCM Control Delay (s)	-	-	-	8.9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	164	5	3	56	60	13	4	24	41	1	27
Future Volume (veh/h)	40	164	5	3	56	60	13	4	24	41	1	27
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	43	178	5	3	61	65	14	4	26	45	1	29
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	90	380	11	7	306	259	27	8	51	137	3	125
Arrive On Green	0.05	0.21	0.21	0.00	0.16	0.16	0.05	0.05	0.05	0.08	0.08	0.08
Sat Flow, veh/h	1767	1796	50	1767	1856	1572	526	150	977	1731	38	1572
Grp Volume(v), veh/h	43	0	183	3	61	65	44	0	0	46	0	29
Grp Sat Flow(s),veh/h/ln	1767	0	1846	1767	1856	1572	1653	0	0	1769	0	1572
Q Serve(g_s), s	0.7	0.0	2.4	0.0	0.8	1.0	0.7	0.0	0.0	0.7	0.0	0.5
Cycle Q Clear(g_c), s	0.7	0.0	2.4	0.0	0.8	1.0	0.7	0.0	0.0	0.7	0.0	0.5
Prop In Lane	1.00		0.03	1.00		1.00	0.32		0.59	0.98		1.00
Lane Grp Cap(c), veh/h	90	0	391	7	306	259	86	0	0	140	0	125
V/C Ratio(X)	0.48	0.00	0.47	0.41	0.20	0.25	0.51	0.00	0.00	0.33	0.00	0.23
Avail Cap(c_a), veh/h	1058	0	2647	609	2188	1855	1650	0	0	1637	0	1455
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	9.5	13.7	9.9	10.0	12.7	0.0	0.0	12.0	0.0	11.9
Incr Delay (d2), s/veh	3.9	0.0	0.9	33.3	0.3	0.5	4.7	0.0	0.0	1.3	0.0	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	0.3	0.0	0.7	0.1	0.2	0.3	0.3	0.0	0.0	0.2	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	0.0	10.4	47.0	10.3	10.5	17.4	0.0	0.0	13.3	0.0	12.8
LnGrp LOS	B	A	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		226			129			44			75	
Approach Delay, s/veh		11.6			11.2			17.4			13.1	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		5.9	4.6	10.3		6.7	5.9	9.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		27.5	9.5	39.5		25.5	16.5	32.5				
Max Q Clear Time (g_c+I1), s		2.7	2.0	4.4		2.7	2.7	3.0				
Green Ext Time (p_c), s		0.2	0.0	1.1		0.3	0.1	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			12.3									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	177	53	61	513	702	126
Future Volume (veh/h)	177	53	61	513	702	126
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	192	58	66	558	763	137
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	284	253	115	2152	1285	231
Arrive On Green	0.16	0.16	0.07	0.61	0.43	0.43
Sat Flow, veh/h	1767	1572	1767	3618	3079	536
Grp Volume(v), veh/h	192	58	66	558	450	450
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1759
Q Serve(g_s), s	4.0	1.3	1.4	2.9	7.7	7.7
Cycle Q Clear(g_c), s	4.0	1.3	1.4	2.9	7.7	7.7
Prop In Lane	1.00	1.00	1.00			0.30
Lane Grp Cap(c), veh/h	284	253	115	2152	759	757
V/C Ratio(X)	0.68	0.23	0.57	0.26	0.59	0.59
Avail Cap(c_a), veh/h	1417	1261	697	7134	2670	2664
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	15.5	14.4	17.8	3.5	8.6	8.6
Incr Delay (d2), s/veh	2.8	0.5	4.4	0.1	0.7	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	1.6	1.2	0.6	0.5	2.2	2.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.3	14.8	22.2	3.6	9.3	9.3
LnGrp LOS	B	B	C	A	A	A
Approach Vol, veh/h	250			624	900	
Approach Delay, s/veh	17.5			5.6	9.3	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		28.5		10.8	7.1	21.4
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		79.5		31.5	15.5	59.5
Max Q Clear Time (g_c+I1), s		4.9		6.0	3.4	9.7
Green Ext Time (p_c), s		4.4		0.7	0.1	7.2

Intersection Summary		
HCM 6th Ctrl Delay		9.2
HCM 6th LOS		A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	1112	130	402	983	722	91	191	451	662	243	149
Future Volume (veh/h)	70	1112	130	402	983	722	91	191	451	662	243	149
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	1209	141	437	1068	785	99	208	490	720	264	162
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	1491	463	507	1366	974	124	596	498	796	614	520
Arrive On Green	0.05	0.29	0.29	0.15	0.39	0.39	0.07	0.17	0.17	0.23	0.33	0.33
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	76	1209	141	437	1068	785	99	208	490	720	264	162
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	4.9	25.4	8.0	14.3	30.6	43.5	6.3	6.0	19.4	23.4	12.7	8.8
Cycle Q Clear(g_c), s	4.9	25.4	8.0	14.3	30.6	43.5	6.3	6.0	19.4	23.4	12.7	8.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	1491	463	507	1366	974	124	596	498	796	614	520
V/C Ratio(X)	0.79	0.81	0.30	0.86	0.78	0.81	0.80	0.35	0.98	0.90	0.43	0.31
Avail Cap(c_a), veh/h	131	1491	463	612	1366	974	206	596	498	884	614	520
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	53.6	37.5	31.4	47.8	30.9	16.6	52.6	42.1	38.9	42.9	30.0	28.7
Incr Delay (d2), s/veh	19.5	3.5	0.4	10.5	3.0	5.0	11.0	0.4	36.0	11.9	0.5	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	10.9	3.1	6.8	13.3	15.8	3.2	2.6	18.4	11.2	5.8	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.1	41.0	31.8	58.3	33.9	21.6	63.6	42.5	75.0	54.8	30.5	29.0
LnGrp LOS	E	D	C	E	C	C	E	D	E	D	C	C
Approach Vol, veh/h		1426			2290			797			1146	
Approach Delay, s/veh		41.8			34.4			65.1			45.5	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.2	23.9	21.5	38.3	12.6	42.5	10.8	49.0
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	29.6	19.4	20.5	32.5	13.4	35.6	8.5	44.5
Max Q Clear Time (g_c+I1), s	25.4	21.4	16.3	27.4	8.3	14.7	6.9	45.5
Green Ext Time (p_c), s	1.2	0.0	0.7	3.5	0.1	2.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	42.8
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	5	135	5	276	46	1653	129	217	1428	6
Future Volume (veh/h)	3	1	5	135	5	276	46	1653	129	217	1428	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	3	1	5	147	5	300	50	1797	140	236	1552	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	41	25	31	169	4	246	64	1925	148	263	2493	11
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.04	0.58	0.58	0.15	0.69	0.69
Sat Flow, veh/h	0	158	198	697	24	1572	1767	3317	255	1767	3599	16
Grp Volume(v), veh/h	9	0	0	152	0	300	50	944	993	236	760	799
Grp Sat Flow(s),veh/h/ln	356	0	0	721	0	1572	1767	1763	1810	1767	1763	1853
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	18.5	3.3	57.1	60.3	15.5	27.5	27.5
Cycle Q Clear(g_c), s	18.5	0.0	0.0	18.5	0.0	18.5	3.3	57.1	60.3	15.5	27.5	27.5
Prop In Lane	0.33		0.56	0.97		1.00	1.00		0.14	1.00		0.01
Lane Grp Cap(c), veh/h	96	0	0	173	0	246	64	1023	1050	263	1221	1283
V/C Ratio(X)	0.09	0.00	0.00	0.88	0.00	1.22	0.78	0.92	0.95	0.90	0.62	0.62
Avail Cap(c_a), veh/h	96	0	0	173	0	246	136	1038	1065	277	1221	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	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	0.0	0.0	52.2	0.0	49.8	56.4	22.4	23.1	49.4	9.8	9.8
Incr Delay (d2), s/veh	0.4	0.0	0.0	36.5	0.0	128.9	17.9	13.1	16.1	28.6	1.0	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	0.2	0.0	0.0	6.3	0.0	16.1	1.8	25.8	28.6	8.9	9.9	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	0.0	0.0	88.7	0.0	178.7	74.3	35.5	39.2	77.9	10.8	10.8
LnGrp LOS	D	A	A	F	A	F	E	D	D	E	B	B
Approach Vol, veh/h		9			452			1987			1795	
Approach Delay, s/veh		43.5			148.4			38.3			19.6	
Approach LOS		D			F			D			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.1	73.0		23.0	8.8	86.3		23.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	18.5	69.5		18.5	9.1	78.9		18.5
Max Q Clear Time (g_c+I1), s	17.5	62.3		20.5	5.3	29.5		20.5
Green Ext Time (p_c), s	0.1	6.2		0.0	0.0	17.8		0.0

Intersection Summary	
HCM 6th Ctrl Delay	42.1
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	310	9	42	407	72	10	5	40	79	5	37
Future Vol, veh/h	32	310	9	42	407	72	10	5	40	79	5	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	35	337	10	46	442	78	11	5	43	86	5	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	520	0	0	347	0	0	1008	1024	342	1009	990	481
Stage 1	-	-	-	-	-	-	412	412	-	573	573	-
Stage 2	-	-	-	-	-	-	596	612	-	436	417	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1041	-	-	1206	-	-	218	234	698	218	245	583
Stage 1	-	-	-	-	-	-	615	593	-	503	502	-
Stage 2	-	-	-	-	-	-	488	482	-	597	590	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1041	-	-	1206	-	-	187	216	698	189	226	583
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	216	-	189	226	-
Stage 1	-	-	-	-	-	-	589	568	-	482	483	-
Stage 2	-	-	-	-	-	-	432	464	-	531	565	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.7	15.2	36.8
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	411	1041	-	-	1206	-	-	240
HCM Lane V/C Ratio	0.145	0.033	-	-	0.038	-	-	0.548
HCM Control Delay (s)	15.2	8.6	0	-	8.1	-	-	36.8
HCM Lane LOS	C	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	310	125	503	363	189	130	64	469	214	39	42
Future Volume (veh/h)	31	310	125	503	363	189	130	64	469	214	39	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	34	337	136	547	395	205	141	70	510	233	42	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	55	406	161	580	532	276	415	194	1091	249	39	37
Arrive On Green	0.03	0.16	0.16	0.33	0.46	0.46	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1767	2465	977	1767	1151	597	962	530	1572	503	106	102
Grp Volume(v), veh/h	34	239	234	547	0	600	211	0	510	321	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1680	1767	0	1748	1492	0	1572	711	0	0
Q Serve(g_s), s	1.8	12.5	12.9	28.8	0.0	26.9	0.0	0.0	14.1	25.2	0.0	0.0
Cycle Q Clear(g_c), s	1.8	12.5	12.9	28.8	0.0	26.9	9.8	0.0	14.1	35.0	0.0	0.0
Prop In Lane	1.00		0.58	1.00		0.34	0.67		1.00	0.73		0.14
Lane Grp Cap(c), veh/h	55	291	277	580	0	807	609	0	1091	325	0	0
V/C Ratio(X)	0.62	0.82	0.84	0.94	0.00	0.74	0.35	0.00	0.47	0.99	0.00	0.00
Avail Cap(c_a), veh/h	94	332	316	619	0	848	609	0	1091	325	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.8	38.6	38.8	31.3	0.0	21.1	22.3	0.0	6.6	37.2	0.0	0.0
Incr Delay (d2), s/veh	10.8	13.8	16.8	22.5	0.0	3.4	0.3	0.0	0.3	46.4	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	1.0	6.5	6.5	15.5	0.0	11.2	3.5	0.0	4.0	11.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.6	52.4	55.6	53.7	0.0	24.5	22.6	0.0	6.9	83.6	0.0	0.0
LnGrp LOS	E	D	E	D	A	C	C	A	A	F	A	A
Approach Vol, veh/h		507			1147			721			321	
Approach Delay, s/veh		54.2			38.4			11.5			83.6	
Approach LOS		D			D			B			F	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		39.5	35.9	20.3		39.5	7.5	48.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		35.0	33.5	18.0		35.0	5.1	46.4				
Max Q Clear Time (g_c+I1), s		16.1	30.8	14.9		37.0	3.8	28.9				
Green Ext Time (p_c), s		3.2	0.6	0.9		0.0	0.0	4.0				

Intersection Summary			
HCM 6th Ctrl Delay			39.6
HCM 6th LOS			D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	1174	216	501	1366	449	96	263	490	307	262	54
Future Volume (veh/h)	70	1174	216	501	1366	449	96	263	490	307	262	54
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	1276	235	545	1485	488	104	286	533	334	285	59
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	81	1284	573	551	1268	395	129	573	508	287	888	396
Arrive On Green	0.05	0.36	0.36	0.16	0.48	0.48	0.07	0.16	0.16	0.16	0.25	0.25
Sat Flow, veh/h	1767	3526	1572	3428	2647	823	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	76	1276	235	545	961	1012	104	286	533	334	285	59
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1707	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	5.1	43.3	13.4	19.0	57.5	57.5	7.0	8.9	19.5	19.5	7.9	3.5
Cycle Q Clear(g_c), s	5.1	43.3	13.4	19.0	57.5	57.5	7.0	8.9	19.5	19.5	7.9	3.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	1284	573	551	845	818	129	573	508	287	888	396
V/C Ratio(X)	0.94	0.99	0.41	0.99	1.14	1.24	0.81	0.50	1.05	1.16	0.32	0.15
Avail Cap(c_a), veh/h	81	1284	573	551	845	818	202	573	508	287	888	396
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	57.1	38.0	28.5	50.2	31.3	31.3	54.8	45.8	40.6	50.2	36.5	34.9
Incr Delay (d2), s/veh	79.2	23.6	0.5	35.2	76.4	117.0	12.2	0.7	53.2	104.7	0.2	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	4.1	22.5	5.1	10.8	41.4	49.3	3.5	3.9	22.3	16.9	3.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	136.3	61.6	29.0	85.5	107.6	148.3	67.0	46.5	93.8	155.0	36.7	35.1
LnGrp LOS	F	E	C	F	F	F	E	D	F	F	D	D
Approach Vol, veh/h		1587			2518			923			678	
Approach Delay, s/veh		60.3			119.2			76.1			94.8	
Approach LOS		E			F			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.0	24.0	23.8	48.2	13.3	34.7	10.0	62.0				
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	19.5	19.3	43.7	13.7	25.3	5.5	57.5				
Max Q Clear Time (g_c+I1), s	21.5	21.5	21.0	45.3	9.0	9.9	7.1	59.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	1.7	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			92.9									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1252	719	133	1183	0	0	0	0	1333	216	231
Future Volume (veh/h)	0	1252	719	133	1183	0	0	0	0	1333	216	231
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1361	782	145	1286	0				1617	0	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1285	573	161	1584	0				1680	0	747
Arrive On Green	0.00	0.36	0.36	0.05	0.45	0.00				0.48	0.00	0.48
Sat Flow, veh/h	0	3618	1572	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1361	782	145	1286	0				1617	0	186
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	43.5	43.5	5.0	37.7	0.0				52.8	0.0	8.4
Cycle Q Clear(g_c), s	0.0	43.5	43.5	5.0	37.7	0.0				52.8	0.0	8.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1285	573	161	1584	0				1680	0	747
V/C Ratio(X)	0.00	1.06	1.36	0.90	0.81	0.00				0.96	0.00	0.25
Avail Cap(c_a), veh/h	0	1285	573	161	1584	0				1700	0	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	37.9	37.9	56.6	28.5	0.0				30.3	0.0	18.6
Incr Delay (d2), s/veh	0.0	42.2	174.8	43.5	3.3	0.0				13.9	0.0	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
%ile BackOfQ(50%),veh/ln	0.0	25.9	44.2	3.1	16.3	0.0				24.9	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	80.2	212.7	100.1	31.8	0.0				44.2	0.0	18.8
LnGrp LOS	A	F	F	F	C	A				D	A	B
Approach Vol, veh/h		2143			1431						1803	
Approach Delay, s/veh		128.5			38.7						41.6	
Approach LOS		F			D						D	

Timer - Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			10.1	48.0		61.2		58.1
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			5.6	43.5		57.4		53.6
Max Q Clear Time (g_c+I1), s			7.0	45.5		54.8		39.7
Green Ext Time (p_c), s			0.0	0.0		1.9		7.8

Intersection Summary	
HCM 6th Ctrl Delay	75.5
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	770	885	391	463	120	824	185	643	208	290	29
Future Volume (veh/h)	16	770	885	391	463	120	824	185	643	208	290	29
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	17	837	962	425	503	130	896	201	699	226	315	32
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	32	781	865	357	667	171	700	828	866	257	324	33
Arrive On Green	0.02	0.15	0.15	0.10	0.24	0.24	0.40	0.45	0.45	0.15	0.20	0.20
Sat Flow, veh/h	1767	5066	1572	3428	2776	714	1767	1856	1572	1767	1657	168
Grp Volume(v), veh/h	17	837	962	425	318	315	896	201	699	226	0	347
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1727	1767	1856	1572	1767	0	1825
Q Serve(g_s), s	1.1	18.5	18.5	12.5	20.1	20.3	47.5	8.1	43.2	15.0	0.0	22.7
Cycle Q Clear(g_c), s	1.1	18.5	18.5	12.5	20.1	20.3	47.5	8.1	43.2	15.0	0.0	22.7
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	32	781	865	357	424	415	700	828	866	257	0	357
V/C Ratio(X)	0.53	1.07	1.11	1.19	0.75	0.76	1.28	0.24	0.81	0.88	0.00	0.97
Avail Cap(c_a), veh/h	75	781	865	357	424	415	700	828	866	378	0	357
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	0.00	1.00
Uniform Delay (d), s/veh	58.4	50.8	27.0	53.8	42.3	42.3	36.3	20.6	21.8	50.3	0.0	47.9
Incr Delay (d2), s/veh	13.2	53.2	66.3	110.1	7.4	7.9	137.2	0.2	5.7	14.8	0.0	39.7
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	0.6	11.6	39.2	10.8	9.6	9.5	46.6	3.5	16.6	7.7	0.0	14.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	103.9	93.3	163.8	49.6	50.2	173.5	20.8	27.5	65.1	0.0	87.6
LnGrp LOS	E	F	F	F	D	D	F	C	C	E	A	F
Approach Vol, veh/h		1816			1058			1796			573	
Approach Delay, s/veh		98.0			95.7			99.6			78.7	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.9	58.1	17.0	23.0	52.0	28.0	6.7	33.3
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	25.7	45.3	12.5	18.5	47.5	23.5	5.1	25.9
Max Q Clear Time (g_c+I1), s	17.0	45.2	14.5	20.5	49.5	24.7	3.1	22.3
Green Ext Time (p_c), s	0.4	0.1	0.0	0.0	0.0	0.0	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	96.0
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	898	2	61	4	2	14	502	740	1	9	784	773
Future Volume (veh/h)	898	2	61	4	2	14	502	740	1	9	784	773
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	977	0	66	4	2	15	546	804	1	10	852	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	973	0	433	7	3	25	469	1868	2	21	928	
Arrive On Green	0.28	0.00	0.28	0.02	0.02	0.02	0.27	0.52	0.52	0.01	0.26	0.00
Sat Flow, veh/h	3534	0	1572	311	155	1165	1767	3613	4	1767	3526	1572
Grp Volume(v), veh/h	977	0	66	21	0	0	546	392	413	10	852	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	1630	0	0	1767	1763	1855	1767	1763	1572
Q Serve(g_s), s	28.5	0.0	3.3	1.3	0.0	0.0	27.5	14.3	14.3	0.6	24.3	0.0
Cycle Q Clear(g_c), s	28.5	0.0	3.3	1.3	0.0	0.0	27.5	14.3	14.3	0.6	24.3	0.0
Prop In Lane	1.00		1.00	0.19		0.71	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	973	0	433	36	0	0	469	911	959	21	928	
V/C Ratio(X)	1.00	0.00	0.15	0.59	0.00	0.00	1.16	0.43	0.43	0.47	0.92	
Avail Cap(c_a), veh/h	973	0	433	283	0	0	469	911	959	85	954	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.5	0.0	28.4	50.2	0.0	0.0	38.0	15.5	15.5	50.8	37.0	0.0
Incr Delay (d2), s/veh	29.9	0.0	0.2	14.4	0.0	0.0	94.6	0.3	0.3	15.1	13.3	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.1	0.0	1.3	0.7	0.0	0.0	24.0	5.6	5.9	0.3	12.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	0.0	28.5	64.6	0.0	0.0	132.6	15.9	15.8	65.9	50.3	0.0
LnGrp LOS	F	A	C	E	A	A	F	B	B	E	D	
Approach Vol, veh/h		1043			21			1351			862	
Approach Delay, s/veh		64.9			64.6			63.1			50.5	
Approach LOS		E			E			E			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	58.0		33.0	32.0	31.8		6.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	50.5		28.5	27.5	28.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	16.3		30.5	29.5	26.3		3.3				
Green Ext Time (p_c), s	0.0	5.8		0.0	0.0	1.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		60.4
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	235	72	25	0	113
Future Vol, veh/h	0	235	72	25	0	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	255	78	27	0	123

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	78
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	980
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	980
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	980
HCM Lane V/C Ratio	-	-	-	0.125
HCM Control Delay (s)	-	-	-	9.2
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	164	5	3	70	100	13	4	24	93	1	27
Future Volume (veh/h)	71	164	5	3	70	100	13	4	24	93	1	27
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	77	178	5	3	76	109	14	4	26	101	1	29
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	139	420	12	7	295	250	27	8	50	194	2	174
Arrive On Green	0.08	0.23	0.23	0.00	0.16	0.16	0.05	0.05	0.05	0.11	0.11	0.11
Sat Flow, veh/h	1767	1796	50	1767	1856	1572	526	150	977	1751	17	1572
Grp Volume(v), veh/h	77	0	183	3	76	109	44	0	0	102	0	29
Grp Sat Flow(s),veh/h/ln	1767	0	1846	1767	1856	1572	1653	0	0	1768	0	1572
Q Serve(g_s), s	1.3	0.0	2.5	0.1	1.1	1.9	0.8	0.0	0.0	1.6	0.0	0.5
Cycle Q Clear(g_c), s	1.3	0.0	2.5	0.1	1.1	1.9	0.8	0.0	0.0	1.6	0.0	0.5
Prop In Lane	1.00		0.03	1.00		1.00	0.32		0.59	0.99		1.00
Lane Grp Cap(c), veh/h	139	0	432	7	295	250	85	0	0	196	0	174
V/C Ratio(X)	0.55	0.00	0.42	0.41	0.26	0.44	0.52	0.00	0.00	0.52	0.00	0.17
Avail Cap(c_a), veh/h	1267	0	2431	501	1639	1389	1461	0	0	1621	0	1442
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.3	0.0	9.8	14.9	11.1	11.4	13.9	0.0	0.0	12.6	0.0	12.1
Incr Delay (d2), s/veh	3.4	0.0	0.7	33.3	0.5	1.2	4.9	0.0	0.0	2.1	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	0.5	0.0	0.8	0.1	0.4	0.6	0.3	0.0	0.0	0.6	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.7	0.0	10.4	48.2	11.5	12.6	18.7	0.0	0.0	14.7	0.0	12.5
LnGrp LOS	B	A	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		260			188			44			131	
Approach Delay, s/veh		12.3			12.7			18.7			14.2	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		6.0	4.6	11.5		7.8	6.9	9.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		26.5	8.5	39.5		27.5	21.5	26.5				
Max Q Clear Time (g_c+I1), s		2.8	2.1	4.5		3.6	3.3	3.9				
Green Ext Time (p_c), s		0.2	0.0	1.1		0.6	0.1	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			13.3									
HCM 6th LOS			B									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	194	88	100	513	702	141
Future Volume (veh/h)	194	88	100	513	702	141
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	211	96	109	558	763	153
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	310	276	150	2163	1238	248
Arrive On Green	0.18	0.18	0.08	0.61	0.42	0.42
Sat Flow, veh/h	1767	1572	1767	3618	3019	587
Grp Volume(v), veh/h	211	96	109	558	460	456
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1750
Q Serve(g_s), s	4.8	2.3	2.6	3.1	8.7	8.7
Cycle Q Clear(g_c), s	4.8	2.3	2.6	3.1	8.7	8.7
Prop In Lane	1.00	1.00	1.00			0.34
Lane Grp Cap(c), veh/h	310	276	150	2163	746	740
V/C Ratio(X)	0.68	0.35	0.73	0.26	0.62	0.62
Avail Cap(c_a), veh/h	1305	1161	808	6569	2293	2276
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	15.4	19.0	3.8	9.6	9.6
Incr Delay (d2), s/veh	2.6	0.7	6.5	0.1	0.8	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	1.9	2.1	1.2	0.6	2.6	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.1	16.2	25.5	3.8	10.4	10.4
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	307			667	916	
Approach Delay, s/veh	18.2			7.4	10.4	
Approach LOS	B			A	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		30.7		12.0	8.1	22.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		79.5		31.5	19.5	55.5
Max Q Clear Time (g_c+I1), s		5.1		6.8	4.6	10.7
Green Ext Time (p_c), s		4.4		0.9	0.2	7.4
Intersection Summary						
HCM 6th Ctrl Delay			10.6			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	1155	138	402	1007	757	98	195	451	691	249	149
Future Volume (veh/h)	70	1155	138	402	1007	757	98	195	451	691	249	149
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	1255	150	437	1095	823	107	212	490	751	271	162
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	1455	452	503	1336	975	133	596	497	826	621	526
Arrive On Green	0.05	0.29	0.29	0.15	0.38	0.38	0.08	0.17	0.17	0.24	0.33	0.33
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	76	1255	150	437	1095	823	107	212	490	751	271	162
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	4.9	27.1	8.7	14.4	32.2	43.7	6.9	6.1	19.5	24.5	13.1	8.8
Cycle Q Clear(g_c), s	4.9	27.1	8.7	14.4	32.2	43.7	6.9	6.1	19.5	24.5	13.1	8.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	1455	452	503	1336	975	133	596	497	826	621	526
V/C Ratio(X)	0.79	0.86	0.33	0.87	0.82	0.84	0.80	0.36	0.99	0.91	0.44	0.31
Avail Cap(c_a), veh/h	127	1455	452	580	1336	975	228	596	497	907	621	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	38.9	32.4	48.1	32.2	17.5	52.5	42.3	39.2	42.5	29.9	28.4
Incr Delay (d2), s/veh	20.7	5.6	0.4	12.1	4.2	6.9	10.7	0.4	36.8	12.3	0.5	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	11.8	3.4	7.0	14.3	17.9	3.4	2.7	18.6	11.7	5.9	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	44.5	32.8	60.2	36.4	24.3	63.1	42.7	76.0	54.8	30.4	28.8
LnGrp LOS	E	D	C	E	D	C	E	D	E	D	C	C
Approach Vol, veh/h		1481			2355			809			1184	
Approach Delay, s/veh		44.9			36.6			65.6			45.6	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.3	24.0	21.4	37.6	13.2	43.1	10.8	48.2
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	30.5	19.5	19.5	32.5	14.9	35.1	8.3	43.7
Max Q Clear Time (g_c+I1), s	26.5	21.5	16.4	29.1	8.9	15.1	6.9	45.7
Green Ext Time (p_c), s	1.2	0.0	0.5	2.5	0.1	2.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	44.6
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	5	136	5	280	46	1653	147	270	1428	6
Future Volume (veh/h)	3	1	5	136	5	280	46	1653	147	270	1428	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	3	1	5	148	5	304	50	1797	160	293	1552	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	40	24	30	166	4	240	64	1836	161	309	2514	11
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.04	0.56	0.56	0.17	0.70	0.70
Sat Flow, veh/h	0	160	200	700	24	1572	1767	3279	288	1767	3599	16
Grp Volume(v), veh/h	9	0	0	153	0	304	50	953	1004	293	760	799
Grp Sat Flow(s),veh/h/ln	360	0	0	723	0	1572	1767	1763	1804	1767	1763	1853
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	18.3	3.4	62.2	66.2	19.7	27.4	27.4
Cycle Q Clear(g_c), s	18.3	0.0	0.0	18.3	0.0	18.3	3.4	62.2	66.2	19.7	27.4	27.4
Prop In Lane	0.33		0.56	0.97		1.00	1.00		0.16	1.00		0.01
Lane Grp Cap(c), veh/h	95	0	0	169	0	240	64	987	1010	309	1231	1294
V/C Ratio(X)	0.09	0.00	0.00	0.90	0.00	1.27	0.78	0.97	0.99	0.95	0.62	0.62
Avail Cap(c_a), veh/h	95	0	0	169	0	240	134	987	1010	309	1231	1294
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	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	0.0	0.0	53.4	0.0	50.8	57.3	25.3	26.2	49.0	9.6	9.6
Incr Delay (d2), s/veh	0.4	0.0	0.0	42.6	0.0	149.2	17.9	20.8	26.7	37.3	0.9	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	0.2	0.0	0.0	6.7	0.0	17.1	1.8	30.2	34.2	11.9	9.9	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.6	0.0	0.0	96.0	0.0	200.0	75.2	46.1	52.9	86.3	10.5	10.5
LnGrp LOS	D	A	A	F	A	F	E	D	D	F	B	B
Approach Vol, veh/h		9			457			2007			1852	
Approach Delay, s/veh		44.6			165.2			50.2			22.5	
Approach LOS		D			F			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.5	71.7		22.8	8.9	88.3		22.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	21.0	67.2		18.3	9.1	79.1		18.3				
Max Q Clear Time (g_c+I1), s	21.7	68.2		20.3	5.4	29.4		20.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	17.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			50.5									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	376	14	68	412	72	10	5	42	79	5	37
Future Vol, veh/h	32	376	14	68	412	72	10	5	42	79	5	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	35	409	15	74	448	78	11	5	46	86	5	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	526	0	0	424	0	0	1145	1161	417	1147	1129	487
Stage 1	-	-	-	-	-	-	487	487	-	635	635	-
Stage 2	-	-	-	-	-	-	658	674	-	512	494	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1036	-	-	1130	-	-	176	194	634	175	203	579
Stage 1	-	-	-	-	-	-	560	549	-	465	471	-
Stage 2	-	-	-	-	-	-	452	452	-	543	545	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1036	-	-	1130	-	-	147	173	634	146	181	579
Mov Cap-2 Maneuver	-	-	-	-	-	-	147	173	-	146	181	-
Stage 1	-	-	-	-	-	-	535	525	-	445	440	-
Stage 2	-	-	-	-	-	-	388	423	-	477	521	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	1	17.5	57.5
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	349	1036	-	-	1130	-	-	191
HCM Lane V/C Ratio	0.178	0.034	-	-	0.065	-	-	0.689
HCM Control Delay (s)	17.5	8.6	0	-	8.4	-	-	57.5
HCM Lane LOS	C	A	A	-	A	-	-	F
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.2	-	-	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	312	191	814	389	189	135	65	497	214	45	42
Future Volume (veh/h)	31	312	191	814	389	189	135	65	497	214	45	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	34	339	208	885	423	205	147	71	540	233	49	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	54	381	229	698	643	311	339	146	1077	174	24	22
Arrive On Green	0.03	0.18	0.18	0.40	0.54	0.54	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1767	2116	1273	1767	1180	572	962	502	1572	388	82	77
Grp Volume(v), veh/h	34	281	266	885	0	628	218	0	540	328	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1626	1767	0	1753	1463	0	1572	546	0	0
Q Serve(g_s), s	1.9	15.6	16.0	39.5	0.0	25.4	0.0	0.0	16.5	16.7	0.0	0.0
Cycle Q Clear(g_c), s	1.9	15.6	16.0	39.5	0.0	25.4	12.3	0.0	16.5	29.0	0.0	0.0
Prop In Lane	1.00		0.78	1.00		0.33	0.67		1.00	0.71		0.14
Lane Grp Cap(c), veh/h	54	317	293	698	0	954	485	0	1077	220	0	0
V/C Ratio(X)	0.63	0.89	0.91	1.27	0.00	0.66	0.45	0.00	0.50	1.49	0.00	0.00
Avail Cap(c_a), veh/h	108	317	293	698	0	954	485	0	1077	220	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.9	40.0	40.2	30.2	0.0	16.2	29.5	0.0	7.6	44.0	0.0	0.0
Incr Delay (d2), s/veh	11.5	24.6	30.0	131.7	0.0	1.7	0.7	0.0	0.4	243.6	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	1.0	8.8	8.8	41.6	0.0	10.0	4.4	0.0	4.9	20.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	64.6	70.2	161.9	0.0	17.8	30.2	0.0	7.9	287.6	0.0	0.0
LnGrp LOS	E	E	E	F	A	B	C	A	A	F	A	A
Approach Vol, veh/h		581			1513			758			328	
Approach Delay, s/veh		66.9			102.1			14.3			287.6	
Approach LOS		E			F			B			F	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.5	44.0	22.5		33.5	7.6	58.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		29.0	39.5	18.0		29.0	6.1	51.4				
Max Q Clear Time (g_c+I1), s		18.5	41.5	18.0		31.0	3.9	27.4				
Green Ext Time (p_c), s		2.7	0.0	0.0		0.0	0.0	4.7				

Intersection Summary			
HCM 6th Ctrl Delay			93.9
HCM 6th LOS			F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	1203	216	531	1697	449	96	263	493	307	262	60
Future Volume (veh/h)	71	1203	216	531	1697	449	96	263	493	307	262	60
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	77	1308	235	577	1845	488	104	286	536	334	285	65
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	81	1313	586	580	1382	350	129	573	522	258	830	370
Arrive On Green	0.05	0.37	0.37	0.17	0.50	0.50	0.07	0.16	0.16	0.15	0.24	0.24
Sat Flow, veh/h	1767	3526	1572	3428	2786	705	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	77	1308	235	577	1137	1196	104	286	536	334	285	65
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1729	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	5.2	44.4	13.2	20.2	59.5	59.5	7.0	8.9	19.5	17.5	8.1	4.0
Cycle Q Clear(g_c), s	5.2	44.4	13.2	20.2	59.5	59.5	7.0	8.9	19.5	17.5	8.1	4.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	1313	586	580	874	857	129	573	522	258	830	370
V/C Ratio(X)	0.95	1.00	0.40	0.99	1.30	1.40	0.81	0.50	1.03	1.30	0.34	0.18
Avail Cap(c_a), veh/h	81	1313	586	580	874	857	202	573	522	258	830	370
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	57.1	37.6	27.8	49.8	30.3	30.3	54.8	45.8	40.1	51.3	38.2	36.6
Incr Delay (d2), s/veh	83.2	23.8	0.4	36.0	143.6	185.3	12.2	0.7	46.7	158.8	0.2	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	4.2	23.1	5.1	11.5	59.0	67.7	3.5	3.9	21.9	19.1	3.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	140.3	61.4	28.2	85.8	173.8	215.5	67.0	46.5	86.8	210.1	38.4	36.8
LnGrp LOS	F	E	C	F	F	F	E	D	F	F	D	D
Approach Vol, veh/h		1620			2910			926			684	
Approach Delay, s/veh		60.3			173.5			72.1			122.1	
Approach LOS		E			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	24.0	24.8	49.2	13.3	32.7	10.0	64.0
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	17.5	19.5	20.3	44.7	13.7	23.3	5.5	59.5
Max Q Clear Time (g_c+I1), s	19.5	21.5	22.2	46.4	9.0	10.1	7.2	61.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	1.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	122.6
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1273	730	133	1378	0	0	0	0	1333	216	397
Future Volume (veh/h)	0	1273	730	133	1378	0	0	0	0	1333	216	397
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	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1384	793	145	1498	0				1617	0	367
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1287	574	161	1585	0				1679	0	747
Arrive On Green	0.00	0.36	0.36	0.05	0.45	0.00				0.48	0.00	0.48
Sat Flow, veh/h	0	3618	1572	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1384	793	145	1498	0				1617	0	367
Grp Sat Flow(s),veh/h/ln	0	1763	1572	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	43.6	43.6	5.0	48.6	0.0				52.9	0.0	19.1
Cycle Q Clear(g_c), s	0.0	43.6	43.6	5.0	48.6	0.0				52.9	0.0	19.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1287	574	161	1585	0				1679	0	747
V/C Ratio(X)	0.00	1.08	1.38	0.90	0.95	0.00				0.96	0.00	0.49
Avail Cap(c_a), veh/h	0	1287	574	161	1585	0				1695	0	754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	37.9	37.9	56.7	31.5	0.0				30.3	0.0	21.5
Incr Delay (d2), s/veh	0.0	48.1	182.4	43.8	12.0	0.0				14.0	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
%ile BackOfQ(50%),veh/ln	0.0	27.0	45.5	3.2	22.7	0.0				24.9	0.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	86.0	220.4	100.5	43.5	0.0				44.4	0.0	22.0
LnGrp LOS	A	F	F	F	D	A				D	A	C
Approach Vol, veh/h		2177			1643						1984	
Approach Delay, s/veh		135.0			48.5						40.2	
Approach LOS		F			D						D	

Timer - Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			10.1	48.1		61.3		58.2
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			5.6	43.6		57.3		53.7
Max Q Clear Time (g_c+I1), s			7.0	45.6		54.9		50.6
Green Ext Time (p_c), s			0.0	0.0		1.9		2.5

Intersection Summary	
HCM 6th Ctrl Delay	78.1
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	775	901	391	516	120	966	185	643	208	290	29
Future Volume (veh/h)	16	775	901	391	516	120	966	185	643	208	290	29
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	17	842	979	425	561	130	1050	201	699	226	315	32
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	32	781	891	329	660	152	729	844	866	257	311	32
Arrive On Green	0.02	0.15	0.15	0.10	0.23	0.23	0.41	0.45	0.45	0.15	0.19	0.19
Sat Flow, veh/h	1767	5066	1572	3428	2843	657	1767	1856	1572	1767	1657	168
Grp Volume(v), veh/h	17	842	979	425	347	344	1050	201	699	226	0	347
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1737	1767	1856	1572	1767	0	1825
Q Serve(g_s), s	1.1	18.5	18.5	11.5	22.6	22.7	49.5	8.0	43.2	15.0	0.0	22.5
Cycle Q Clear(g_c), s	1.1	18.5	18.5	11.5	22.6	22.7	49.5	8.0	43.2	15.0	0.0	22.5
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	32	781	891	329	409	403	729	844	866	257	0	342
V/C Ratio(X)	0.53	1.08	1.10	1.29	0.85	0.85	1.44	0.24	0.81	0.88	0.00	1.01
Avail Cap(c_a), veh/h	75	781	891	329	409	403	729	844	866	378	0	342
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	0.00	1.00
Uniform Delay (d), s/veh	58.4	50.8	26.0	54.2	44.1	44.1	35.3	20.0	21.8	50.3	0.0	48.8
Incr Delay (d2), s/veh	13.2	55.4	60.8	153.0	15.4	16.1	206.0	0.1	5.7	14.8	0.0	52.2
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	0.6	11.8	38.8	11.9	11.6	11.5	62.4	3.5	16.6	7.7	0.0	15.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	106.1	86.8	207.2	59.4	60.2	241.2	20.2	27.5	65.1	0.0	101.0
LnGrp LOS	E	F	F	F	E	E	F	C	C	E	A	F
Approach Vol, veh/h		1838			1116			1950			573	
Approach Delay, s/veh		95.5			116.0			141.8			86.8	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.9	59.1	16.0	23.0	54.0	27.0	6.7	32.3
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	25.7	46.3	11.5	18.5	49.5	22.5	5.1	24.9
Max Q Clear Time (g_c+I1), s	17.0	45.2	13.5	20.5	51.5	24.5	3.1	24.7
Green Ext Time (p_c), s	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.1

Intersection Summary		
HCM 6th Ctrl Delay		115.3
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1028	2	61	4	2	14	502	752	1	9	785	788
Future Volume (veh/h)	1028	2	61	4	2	14	502	752	1	9	785	788
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	1118	0	66	4	2	15	546	817	1	10	853	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	1041	0	463	7	3	25	435	1798	2	21	929	
Arrive On Green	0.29	0.00	0.29	0.02	0.02	0.02	0.25	0.50	0.50	0.01	0.26	0.00
Sat Flow, veh/h	3534	0	1572	311	155	1165	1767	3613	4	1767	3526	1572
Grp Volume(v), veh/h	1118	0	66	21	0	0	546	399	419	10	853	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572	1630	0	0	1767	1763	1855	1767	1763	1572
Q Serve(g_s), s	30.5	0.0	3.2	1.3	0.0	0.0	25.5	15.2	15.2	0.6	24.3	0.0
Cycle Q Clear(g_c), s	30.5	0.0	3.2	1.3	0.0	0.0	25.5	15.2	15.2	0.6	24.3	0.0
Prop In Lane	1.00		1.00	0.19		0.71	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1041	0	463	36	0	0	435	877	923	21	929	
V/C Ratio(X)	1.07	0.00	0.14	0.59	0.00	0.00	1.25	0.45	0.45	0.47	0.92	
Avail Cap(c_a), veh/h	1041	0	463	283	0	0	435	877	923	85	953	
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	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.5	0.0	26.9	50.2	0.0	0.0	39.0	16.9	16.9	50.8	37.1	0.0
Incr Delay (d2), s/veh	50.0	0.0	0.1	14.4	0.0	0.0	132.2	0.4	0.4	15.1	13.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.1	0.0	1.2	0.7	0.0	0.0	26.8	6.0	6.4	0.3	12.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.5	0.0	27.0	64.6	0.0	0.0	171.3	17.3	17.2	66.0	50.4	0.0
LnGrp LOS	F	A	C	E	A	A	F	B	B	E	D	
Approach Vol, veh/h		1184			21			1364			863	
Approach Delay, s/veh		83.2			64.6			78.9			50.6	
Approach LOS		F			E			E			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	56.0		35.0	30.0	31.8		6.8
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	48.5		30.5	25.5	28.0		18.0
Max Q Clear Time (g_c+I1), s	2.6	17.2		32.5	27.5	26.3		3.3
Green Ext Time (p_c), s	0.0	5.9		0.0	0.0	0.9		0.0

Intersection Summary			
HCM 6th Ctrl Delay			73.2
HCM 6th LOS			E

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	2					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↱		↱
Traffic Vol, veh/h	0	299	72	54	0	121
Future Vol, veh/h	0	299	72	54	0	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	125	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	325	78	59	0	132

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	78
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	980
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	980
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	980
HCM Lane V/C Ratio	-	-	-	0.134
HCM Control Delay (s)	-	-	-	9.2
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	164	5	3	99	185	13	4	24	101	1	27
Future Volume (veh/h)	135	164	5	3	99	185	13	4	24	101	1	27
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	147	178	5	3	108	201	14	4	26	110	1	29
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	199	568	16	7	386	327	26	7	49	188	2	168
Arrive On Green	0.11	0.32	0.32	0.00	0.21	0.21	0.05	0.05	0.05	0.11	0.11	0.11
Sat Flow, veh/h	1767	1796	50	1767	1856	1572	526	150	977	1752	16	1572
Grp Volume(v), veh/h	147	0	183	3	108	201	44	0	0	111	0	29
Grp Sat Flow(s),veh/h/ln	1767	0	1846	1767	1856	1572	1653	0	0	1768	0	1572
Q Serve(g_s), s	2.8	0.0	2.6	0.1	1.7	4.0	0.9	0.0	0.0	2.1	0.0	0.6
Cycle Q Clear(g_c), s	2.8	0.0	2.6	0.1	1.7	4.0	0.9	0.0	0.0	2.1	0.0	0.6
Prop In Lane	1.00		0.03	1.00		1.00	0.32		0.59	0.99		1.00
Lane Grp Cap(c), veh/h	199	0	584	7	386	327	82	0	0	189	0	168
V/C Ratio(X)	0.74	0.00	0.31	0.41	0.28	0.62	0.53	0.00	0.00	0.59	0.00	0.17
Avail Cap(c_a), veh/h	1359	0	2492	385	1481	1255	1128	0	0	1257	0	1118
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	0.0	8.9	17.1	11.5	12.4	16.0	0.0	0.0	14.7	0.0	14.0
Incr Delay (d2), s/veh	5.3	0.0	0.3	33.5	0.4	1.9	5.3	0.0	0.0	2.9	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	1.2	0.0	0.8	0.1	0.6	1.2	0.4	0.0	0.0	0.8	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	0.0	9.2	50.6	11.9	14.3	21.2	0.0	0.0	17.5	0.0	14.5
LnGrp LOS	C	A	A	D	B	B	C	A	A	B	A	B
Approach Vol, veh/h		330			312			44			140	
Approach Delay, s/veh		14.1			13.8			21.2			16.9	
Approach LOS		B			B			C			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		6.2	4.6	15.4		8.2	8.4	11.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		23.5	7.5	46.5		24.5	26.5	27.5				
Max Q Clear Time (g_c+I1), s		2.9	2.1	4.6		4.1	4.8	6.0				
Green Ext Time (p_c), s		0.2	0.0	1.1		0.6	0.4	1.2				

Intersection Summary		
HCM 6th Ctrl Delay		14.8
HCM 6th LOS		B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	197	93	184	513	702	171
Future Volume (veh/h)	197	93	184	513	702	171
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	214	101	200	558	763	186
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	301	268	263	2293	1157	282
Arrive On Green	0.17	0.17	0.15	0.65	0.41	0.41
Sat Flow, veh/h	1767	1572	1767	3618	2903	685
Grp Volume(v), veh/h	214	101	200	558	479	470
Grp Sat Flow(s),veh/h/ln	1767	1572	1767	1763	1763	1732
Q Serve(g_s), s	5.7	2.9	5.5	3.3	11.0	11.0
Cycle Q Clear(g_c), s	5.7	2.9	5.5	3.3	11.0	11.0
Prop In Lane	1.00	1.00	1.00			0.40
Lane Grp Cap(c), veh/h	301	268	263	2293	726	714
V/C Ratio(X)	0.71	0.38	0.76	0.24	0.66	0.66
Avail Cap(c_a), veh/h	968	862	933	5866	1844	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	19.7	18.5	20.5	3.6	11.9	11.9
Incr Delay (d2), s/veh	3.1	0.9	4.5	0.1	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.6	2.4	0.7	3.7	3.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.8	19.3	25.0	3.7	12.9	13.0
LnGrp LOS	C	B	C	A	B	B
Approach Vol, veh/h	315			758	949	
Approach Delay, s/veh	21.7			9.3	13.0	
Approach LOS	C			A	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		37.1		13.0	12.0	25.2
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		83.5		27.5	26.5	52.5
Max Q Clear Time (g_c+I1), s		5.3		7.7	7.5	13.0
Green Ext Time (p_c), s		4.4		0.9	0.5	7.7
Intersection Summary						
HCM 6th Ctrl Delay			12.9			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	1162	139	402	1057	831	112	205	451	695	250	149
Future Volume (veh/h)	70	1162	139	402	1057	831	112	205	451	695	250	149
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	1263	151	437	1149	903	122	223	490	755	272	162
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	1434	445	498	1317	967	149	621	505	827	617	523
Arrive On Green	0.05	0.28	0.28	0.15	0.37	0.37	0.08	0.18	0.18	0.24	0.33	0.33
Sat Flow, veh/h	1767	5066	1572	3428	3526	1572	1767	3526	1572	3428	1856	1572
Grp Volume(v), veh/h	76	1263	151	437	1149	903	122	223	490	755	272	162
Grp Sat Flow(s),veh/h/ln	1767	1689	1572	1714	1763	1572	1767	1763	1572	1714	1856	1572
Q Serve(g_s), s	4.9	27.7	8.9	14.5	35.3	43.5	7.9	6.5	20.5	25.0	13.3	8.9
Cycle Q Clear(g_c), s	4.9	27.7	8.9	14.5	35.3	43.5	7.9	6.5	20.5	25.0	13.3	8.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	1434	445	498	1317	967	149	621	505	827	617	523
V/C Ratio(X)	0.79	0.88	0.34	0.88	0.87	0.93	0.82	0.36	0.97	0.91	0.44	0.31
Avail Cap(c_a), veh/h	114	1434	445	545	1317	967	241	621	505	898	617	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	39.9	33.1	48.8	33.9	20.3	52.4	42.2	39.0	43.0	30.4	28.9
Incr Delay (d2), s/veh	26.0	6.7	0.4	14.3	6.7	15.5	10.7	0.4	32.4	12.9	0.5	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	2.9	12.3	3.4	7.2	16.0	24.5	3.9	2.9	18.1	12.0	6.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.4	46.6	33.6	63.0	40.6	35.8	63.1	42.5	71.4	55.9	30.9	29.2
LnGrp LOS	F	D	C	E	D	D	E	D	E	E	C	C
Approach Vol, veh/h		1490			2489			835			1189	
Approach Delay, s/veh		47.0			42.8			62.5			46.5	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.6	25.0	21.4	37.5	14.3	43.2	10.9	48.0
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	30.5	20.5	18.5	32.5	15.9	35.1	7.5	43.5
Max Q Clear Time (g_c+I1), s	27.0	22.5	16.5	29.7	9.9	15.3	6.9	45.5
Green Ext Time (p_c), s	1.1	0.0	0.4	2.1	0.1	2.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	47.3
HCM 6th LOS	D

APPENDIX H

SPECIAL-STATUS SPECIES QUERIES

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: September 20, 2022
Project Code: 2022-0087399
Project Name: Graton Casino Expansion

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 ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system 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:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.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 https://www.fws.gov/birds/policies-and-regulations.php.

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/birds/bird-enthusiasts/threats-to-birds.php.

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/birds/policies-and-regulations/executive-orders/e0-13186.php.

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: 2022-0087399
Project Name: Graton Casino Expansion
Project Type: Commercial Development
Project Description: On-site development work.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.3604778,-122.72229340153697,14z

Counties: Sonoma 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.

---

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.

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (CA - Sonoma County) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Endangered

Insects

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
California Freshwater Shrimp *Syncaris pacifica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7903	Endangered

Flowering Plants

NAME	STATUS
Burke's Goldfields *Lasthenia burkei* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4338	Endangered
Sebastopol Meadowfoam *Limnanthes vinculans* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/404	Endangered
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
Sonoma Alopecurus *Alopecurus aequalis var. sonomensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/557	Endangered
Sonoma Sunshine *Blennosperma bakeri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1260	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency: Federated Indians of Graton Rancheria, California
Name: Jedidiah Dowell
Address: 1801 7th St
City: Sacramento
State: CA
Zip: 95811
Email jedowell@analyticalcorp.com
Phone: 9164473479

Lead Agency Contact Information

Lead Agency: County of Sonoma

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Cotati (3812236))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S1S2	SSC
Ambystoma californiense pop. 3 California tiger salamander - Sonoma County DPS	AAAAA01183	Endangered	Threatened	G2G3T2	S2	WL
Amorpha californica var. napensis Napa false indigo	PDFAB08012	None	None	G4T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Blennosperma bakeri Sonoma sunshine	PDAST1A010	Endangered	Endangered	G1	S1	1B.1
Bombus occidentalis western bumble bee	IIHYM24250	None	None	G2G3	S1	
Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2	None	None	G3T2	S2	1B.2
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Lasthenia burkei Burke's goldfields	PDAST5L010	Endangered	Endangered	G1	S1	1B.1
Limnanthes vinculans Sebastopol meadowfoam	PDLIM02090	Endangered	Endangered	G1	S1	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2	1B.2
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trifolium amoenum two-fork clover	PDFAB40040	Endangered	None	G1	S1	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2

Record Count: 21

Search Results

11 matches found. Click on scientific name for details

Search Criteria: CRPR is one of [**1A:1B:2A:2B**] , Quad is one of [**3812236**]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK
Amorpha californica var. napensis	Napa false indigo	Fabaceae	perennial deciduous shrub	Apr-Jul	None	None	G4T2	S2	1B.2
Blennosperma bakeri	Sonoma sunshine	Asteraceae	annual herb	Mar-May	FE	CE	G1	S1	1B.1
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	annual herb	May-Nov	None	None	G3T2	S2	1B.2
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Asteraceae	annual herb	Apr-Nov	None	None	G5T2	S2	1B.2
Lasthenia burkei	Burke's goldfields	Asteraceae	annual herb	Apr-Jun	FE	CE	G1	S1	1B.1
Limnanthes vinculans	Sebastopol meadowfoam	Limnanthaceae	annual herb	Apr-May	FE	CE	G1	S1	1B.1
Microseris paludosa	marsh microseris	Asteraceae	perennial herb	Apr-Jun(Jul)	None	None	G2	S2	1B.2
Pleuropogon hooverianus	North Coast semaphore grass	Poaceae	perennial rhizomatous herb	Apr-Jun	None	CT	G2	S2	1B.1
Rhynchospora globularis	round-headed beaked-rush	Cyperaceae	perennial rhizomatous herb	Jul-Aug	None	None	G5	S1	2B.1
Trifolium amoenum	two-fork clover	Fabaceae	annual herb	Apr-Jun	FE	None	G1	S1	1B.1
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2

Showing 1 to 11 of 11 entries

Suggested Citation:
California Native Plant Society, Rare Plant Program. 2022. Rare Plant Inventory (online edition, v9-01 1.5). Website https://www.rareplants.cnps.org [accessed 20 September 2022].

APPENDIX I

COMMENT LETTERS ON THE DRAFT TEIR

OFFICE OF THE COUNTY ADMINISTRATOR

COUNTY OF SONOMA
575 ADMINISTRATION DRIVE – ROOM 104A
SANTA ROSA, CALIFORNIA 95403-2888
TELEPHONE (707) 565-2431
FAX (707) 565-3778

MARIA CHRISTINA RIVERA
COUNTY ADMINISTRATOR

PETER BRULAND
DEPUTY COUNTY ADMINISTRATOR

BARBARA LEE
DEPUTY COUNTY ADMINISTRATOR

CHRISTEL QUERIJERO
DEPUTY COUNTY ADMINISTRATOR

PAUL GULLIXSON
COMMUNICATIONS MANAGER

February 8, 2023

Federated Indians of Graton Rancheria
Attn: Draft TEIR Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

Re: Draft Tribal Environmental Impact Report December 2022 – Graton Resort & Casino Expansion Project

Dear Sir or Madam,

The County of Sonoma is in receipt of the Draft Tribal Environmental Impact Report (TEIR) for the Graton Resort & Casino Expansion Project (December 2022). The County and the Sonoma County Water Agency have reviewed the TEIR and prepared the attached comments. We understand the Tribe's desire to move quickly and have done our best to review the TEIR as expeditiously as possible. Different staff reviewed and provided comments which are compiled in the attachment to this letter. While we may have additional comments, our immediate and most significant concerns arise in the following areas:

- Aesthetics
- Air Quality
- Biological Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Water Resources
- Housing
- Public Services
- Transportation and Traffic

A1-01

We are interested in working with the Tribe to address the concerns and impacts raised in these comments, both through modifications to the proposed project and an intergovernmental mitigation agreement. If you have any questions regarding these comments, need additional information or clarification, or would like to meet to discuss mitigation possibilities, please contact me at Marissa.Montenegro@sonoma-county.org or 707-565-3771.

Sincerely,

MMontenegro

Marissa Montenegro
Intergovernmental Affairs Manager
County of Sonoma

CC: Counsel for Tribe, Jim Cohen, Maier Pfeffer Kim Geary & Cohen, LLP
(jcohen@jmandmplaw.com)

Christina Rivera, County Administrator
Robert Pittman, County Counsel
Jennifer C. Klein, Chief Deputy County Counsel
Barbara Lee, CAO Climate and Resilience Division Manager
Tennis Wick, Director, Permit Sonoma
John Mack, Division Manager, Permit Sonoma
Ronda Coffman, Interim Executive Director, Community Development Commission
Grant Davis, General Manager, Sonoma County Water Agency
Johannes Hoevertsz, Director, Public Infrastructure
Janice Thompson, Deputy Director, Public Infrastructure

Attachment

Attachment 1

County of Sonoma and Sonoma County Water Agency
Comments on the Graton Rancheria Hotel Expansion Project
Draft Tribal Environmental Impact Report

This document provides comments on the Draft Tribal Environmental Impact Report (TEIR) for the Graton Resort & Casino Expansion Project (December 2022). The lead agency is the Federated Indians of Graton Rancheria (Tribe) and the report was prepared by Analytical Environmental Services. The County of Sonoma and Sonoma County Water Agency (County) sincerely appreciate the opportunity to provide comments. A1-02

Project Impacts Summary:
The project proposes substantial changes and additions to the existing facility, including expanded hotel, gaming floor, theater, and parking garage space. The project will be constructed within the existing developed footprint of the existing facility. This largely avoids conversion of new wetland or upland habitats and plant communities to developed uses as well as most potential direct impacts to rare, listed, or special concern plant and animal species. The project will, however, result in substantial increases in other likely impacts due to the near doubling of gaming and hotel capacity, and the addition of new facilities (e.g., theater, second parking structure, rooftop restaurant):

	Existing	**Expansion**	**Total**
Gaming area (ft2)	120,000	86,000	206,000
Back of House (ft2)	55,000	58,000	113,000
Banquet Ara (ft2)	45,000	n/a	45,000
Rooftop Restaurant	n/a	9,700	9,700
Spa/Pool Area	?	18,000	?
Total Area (ft2)	220,000	171,700	373,700
Hotel Rooms	200	221	421
Theater (seats)	n/a	3500	3500
Parking Structures	1	1	2

A1-03

We note that it is unclear if the spa pool area will be merely modified in its existing footprint or if it will be the same size and capacity in a different footprint, or if it will be expanded with a new footprint. Please clarify. A1-04

In terms of environmental impacts, the planned increase in ground water use to support the expansion is significant. Existing Use and Proposed Expansion Use is summarized in the Water Resources Section below. Groundwater use from the on-site wells will nearly double from an existing 183,900 gallons per day (gpd) (241,000 gpd maximum) to 337,800 gpd (418,000 maximum), an 83.7% increase. Put simply, the Existing Casino Facility uses the equivalent of 400 single family residences of groundwater annually, and the Expansion area will increase this use to approximately 740 single family residences. The proposed expansion will increase use approximately 55 more acre feet per year than was analyzed as the maximum use in the original EIS for the project. The original ground water impact analysis concluded the existing facility would have a negative impact on the overall Santa Rosa Plains basin which is predicted to be in overdraft conditions by the latest studies of the Groundwater Sustainability Agency, absent the use of project and basin-scale mitigations. In addition, to potential groundwater impacts, the A1-05

TEIR estimates greenhouse gas emissions will increase by over 8,000 CO_2 equivalents per year, as well as substantial increases in traffic, vehicle miles traveled, emergency response and law enforcement needs. A1-06

Finally, the existing casino was largely constructed by 2013 with additions in 2016. Its stormwater management system would have presumably been largely designed to standards of well over a decade ago (at least two MS4 Phase 1 permit cycles ago). If this was a project located in unincorporated Sonoma County, it would be subject to the new construction/reconstruction standards of the current Phase 1 MS4 Permit and the most recent version of the Low Impact Development Manual in terms of volume detention and water quality treatment requirements. The County asks that the project be designed to apply those modern requirements to the FIGR's project and provide an opportunity for review and comment of the various construction and post-construction sediment and stormwater management plans and facilities by Permit Sonoma. A1-07

Based on the County's review of the December 2022 Draft TEIR, the primary areas of concern and key recommendations are described below. In some cases, more information is needed for the potential impacts of the Proposed Project to be adequately evaluated. A1-08

General Comments:

Air Quality and GHG sections:

- The air quality thresholds of significance are not recognized standards. The draft TEIR uses major stationary source permitting thresholds (these are for large industrial operations). The BAAQMD has established thresholds of significance for criteria air pollutants for land use projects which are, generally speaking (for maximum annual emissions), an order of magnitude lower that the stationary source major source thresholds. It was not clear to county staff whether the project reported maximum annual emissions or average annual emissions. The TEIR should be updated using the BAAQMD thresholds, or comparable thresholds, that are aligned to land use projects akin to the proposal to clearly identify and analyze the project's real air quality impacts. A1-09
- The draft TEIR compares the project's construction-related emissions to the BAAQMD annual emissions thresholds for project operation. The BAAQMD significance thresholds for construction related emissions are daily thresholds. The TEIR should be updated using BAAQMD's or comparable daily construction related thresholds to clearly identify and analyze the project's real air quality impacts for construction. A1-10
- The draft TEIR states that there are no local "plans" for air quality or GHG that cover the adjacent off-reservation area. Although the RCPA's Climate Action Plan was overturned in court, the County has a Strategic Plan approved by the Board that establishes an overarching goal to make Sonoma County carbon neutral by 2030. The City of Rohnert Park has the same goal (as do the other cities). Alignment with county-wide carbon neutrality goals by 2030 should be considered when evaluating whether the project is significant, even where FIGR may not yet have established a similar goal within its jurisdiction, to give meaningful information on impacts surrounding jurisdictions can expect. Also, note that the BAAQMD has their 2017 Clean Air Plan, which is part of the State Implementation Plan (SIP). A1-11
- The draft TIER's summary of the climate regulatory framework is incomplete in that it only characterizes some of the GHG emission reduction targets in statute; specifically, it fails to mention SB 32 (which sets the reduction target of 40% below 1990 levels by 2030) and AB 1279 A1-12

(which establishes the policy of the state to achieve carbon neutrality as soon as possible, but no later than 2045; to maintain net negative GHG emissions thereafter; and to ensure that by 2045 statewide anthropogenic GHG emissions). Other legislation not described sets specific targets for the energy sector and high GWP emission reductions, as well as targets for natural and working lands, that have shaped the sector-specific elements of the 2022 Scoping Plan. are reduced at least 85 percent below 1990 levels. Alignment with these state targets should be considered when evaluating whether the project is significant, even where FIGR may not yet have established similar reduction targets within its jurisdiction, to give meaningful information on impacts surrounding jurisdictions can expect. A1-12 (Cont.)

- The draft TEIR identifies CARB's 2017 AB 32 Scoping Plan as the current Plan; this is incorrect. The current AB 32 Scoping Plan is the 2022 Plan. The 2022 Plan is very different from the 2017 Plan because it sets out actions to aggressively promote and require the adoption of new, low-carbon technologies. For those reasons, the TEIR should be updated to reflect the updated AB 32 Scoping Plan. A1-13

Climate Change Analysis

- The draft TEIR did not identify the correct frame for determining the significance of the project or the appropriate mitigations related to GHG emissions and Climate Change. The draft states the project would be significant if it would "Conflict with any off-reservation plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases." The TEIR evaluated the 2017 CARB Scoping Plan and concluded it would not conflict; the correct frame would evaluate the 2022 CARB Scoping Plan and given the breadth of the measures in the newer Plan, the project would be significant without further mitigations. Without further mitigations, the project would also conflict with the County-wide reduction targets of carbon neutrality by 2030. A1-14
- The draft TEIR did not evaluate energy use and the source(s) of energy, per the 2018 CEQA Guidelines. Section 15126.2(b) was added to the Guidelines to capture the requirements in Appendix F (Energy Conservation). The section requires an analysis of a project's energy use to determine if the project will result in significant effects due to wasteful, inefficient, or unnecessary use of energy. This analysis should include the project's energy use for all project phases and components, including transportation-related energy, during construction and operation. According to OPR, the "relevant considerations may include, among others, the project's size, location, orientation, equipment use, and any renewable energy features that could be incorporated into the project". Evaluating energy use is important because it specifically highlights opportunities to reduce GHG emissions through energy efficiency and renewable energy. A1-15
- The draft TEIR for the project did not evaluate climate hazards. According to the Attorney General, CEQA requires that state and local agencies (1) evaluate and disclose the significant environmental impacts of locating development in areas susceptible to hazardous conditions, and (2) adopt all feasible mitigation measures to reduce or eliminate those impacts. In October of 2022 the Attorney General issued guidance on best practices and mitigation measures for projects proposed in areas with high wildfire risk. While CEQA does not apply to the TEIR process, to fully analyze environmental impacts of I draft TEIR should be updated to evaluate A1-16

wildfire and flooding, which are especially impactful in Sonoma County where there is a history of both. Similarly, the TEIR should include consideration of extreme heat, extreme weather, and drought (also affecting Sonoma County); the basis is that the 2020 Scoping Plan incorporates targets and actions on the landscape (including in developed areas) related to adaptation and resilience. The County's Climate Resilient Lands Strategy also evaluated these climate hazards. A1-16 (Cont.)

If the draft TEIR referenced the 2022 Scoping Plan instead of the 2017 Plan, it would identify the following "standards" and associated mitigations: A1-17

- Scoping Plan Sector Target: Reduce VMT by 25% below 2019 by 2030. The Plan lays out key strategies to achieve this reduction, including transportation mode shifting and autonomous shuttles. The draft TEIR should incorporate mitigation measures to promote mode shifting, such as offering transit vouchers to staff and visitors, and establishing shuttles (potentially free or subsidized) between the Project site and the SMART station. The Scoping Plan, the BAAQMD guidance, and the RCPA Climate Mobilization Strategy describe other measures that can reduce VMT. A1-18
- Scoping Plan Target: Decarbonize transportation fuels. The Plan lays out a trajectory for decarbonizing this sector, including 100% of sales of Light Duty vehicles will be ZEVs by 2035, and 100% of Medium Duty sales will be ZEVs by 2040. There are other targets for heavy duty trucks and buses. The draft TEIR should incorporate mitigation measures such as a defined schedule for expanding EV charging infrastructure to accommodate the required growth in ZEV use, including charging for passenger vehicles, buses and delivery trucks. The draft TEIR should also incorporate additional measures, such as a commitment to only deploy or contract for ZE charter buses, to electrify the Casino fleet, and to incentivize employee ZEV use. A1-19
- Scoping Plan Target: Reduce CO2e from Electricity Generation to 38 MMT by 2030 & 30 MMT by 2035. The Plan includes demand response as one of the strategies to achieve these reductions. The draft TEIR should incorporate mitigation measures to install solar collection and battery backup to support participation in demand response, and a commitment to purchase "green" electricity (such as from Sonoma Clean Power). A1-20
- Scoping Plan Target: Reduce GHG from building energy use, including only allowing new buildings that are 100% electric in 2026 and 2029, and a planned transition to all electric existing buildings (with percentages and dates for sectors). The Plan emphasizes the importance of heat pumps. The draft TEIR should commit to 100% electric buildings (if not initially, then on a set schedule) and incorporate measures to decarbonize through increased efficiency in more than lighting. Heat pump technology for heating and cooling habitable space should be incorporated as a building energy mitigation measure, as well as for water heating (in the hotel and the pool). If the buildings are not 100% electric as-built, they should be electric-ready (consistent with the current electricity code). The draft TEIR should also include mitigation measures for the highest R value insulation, low-e glass, and maximizing passive lighting, heating, and cooling. A1-21
- Scoping Plan Target: Reduce carbon from building construction. The Plan includes a schedule for this with sector-specific strategies. The draft TEIR should incorporate measures to reduce the carbon-intensity of construction, including the use of alternative building materials, such as: A1-22

- Climate smart concrete (Ferrock, made from steel dust and iron rock waste, is carbon neutral) or lightweight hempcrete or similar; A1-22 (Cont.)
- Smart glass alters its thermal characteristics depending on use of heat and air conditioning inside the building (other goals for stone, clay); and
- Other materials with lower embedded carbon, such as bamboo or reclaimed wood, lightweight & recycled steel, composite roofing tiles, prefabricated structural panels.

- Scoping Plan Target: Replacing High GWP refrigerants with Low GWP refrigerants. The draft TEIR should incorporate mitigation measures to use heat pump technology for cooling habitable space (instead of traditional air conditioning), and commitment to use refrigeration with low GWP refrigerants. A1-23
- Scoping Plan Target: Reduce methane. The Plan articulates strategies different methane producing sectors, and the draft TEIR should incorporate mitigation measures consistent with appropriate sector targets, such as implementing zero waste strategies, food waste recovery, carbon reduction technologies for wastewater treatment. A1-24
- Scoping Plan Target: Increase urban forestry by 200% per year. The plan discusses specific strategies and the draft TEIR should incorporate them as appropriate, including strategies and community greening efforts such as rain gardens, living walls and roofs, tree planting, etc. A1-25

If the draft TEIR explicitly evaluated energy use, it would also be able to characterize the benefits of the mitigation measures to improve efficiency and lower energy use. A1-26

The TEIR should evaluate how the Project impacts climate hazards off-reservation, and whether mitigation measures that alter its design could reduce those impacts. The climate hazards that need to be evaluated include wildfire and flooding primarily, with a fair argument that extreme weather, heat, and drought should be evaluated as well. The draft TEIR currently assumes that construction of the existing facility is sufficient to address any increased climate hazards – however since the original designs and construction, Sonoma County has experienced extreme fire behavior and extreme rain events that are predicted to become even worse as the climate changes. Buildings and associated infrastructure need improved fire hardening and flood management features to respond to these changes, and other protective and adaptive features to be resilient to the full range and severity of climate hazards projected for this region. A1-27

The Scoping Plan also embodies the state's Climate Adaptation Plan and Strategy for Natural and Working Lands. In addition, the County has a Climate Resilient Lands Strategy. Consistency with targets and measures in these plans points to additional mitigation measures, including: A1-28

- Installing permeable hardscape in sidewalks, patios, and other outdoor areas where impermeable surfaces might otherwise be used;
- Implementing nature-based solutions like urban trees and other greenspace infrastructure; and
- Using exterior materials that reduce heat island effect.

Overall, updating the TEIR to robustly analyze climate change consistent with the above comments would address important off-reservation impacts, and would assist the FIGR in identifying on reservation impacts as well, which can aid in long term resilient infrastructure planning. A1-29

Landscaping

- "Landscaping will be consistent with the existing landscape design. Consistent with existing facilities, the Proposed Project will use downcast, fully shielded, high efficiency lamps for exterior lighting, will avoid exterior neon and flashing lights, and will glaze exterior glass to minimize glare and nighttime illumination." A1-30
  The TEIR should be updated so that this language is consistent throughout the document as TEIR *Section 3.2.3 BMPs, bullet #4, states, "Obtrusive light-emitting devices such as neon lights or flashing lights will not be used."*

- "The Proposed Project may include an expansion of the solar array to the new rooftop area." A1-31
  Consider revising the project to include an expansion of the solar array to cover the new rooftop and parking areas.

Air Quality/GHGs

- "Shuttle service to and from population centers shall be provided as feasible, which would reduce CAPs and GHGs." A1-32
  Consider providing shuttle service to and from current and/or future nearby SMART train stations.

- "The Tribe shall promote the use of non-polystyrene take-out containers and encourage food waste composting programs at all restaurants that serve more than 100 meals per day. The Tribe shall reduce the solid waste stream of the facility by at least 50 percent." A1-33
  Consider eliminating all polystyrene takeout containers and require food waste composting for all restaurant or food stall uses onsite.

- "The Tribe shall discourage buses from idling for extended periods during operation of the Proposed Project." A1-34
  Consider developing a revised bus schedule to minimize the time that buses may wait idling, or consider requiring that buses shut down engines while parked onsite. Alternatively, a plan for the use of alternative fuel buses could be proposed to further FIGR's climate goals.

Water Resources

- "High water-demand plants will be minimized in landscaping plans." A1-35
  Consider revising this language to eliminate high-water demand plants from the proposed landscape inventory.

Transportation

- *As a component of the Traffic Demand Management Plan, the County requests that the Tribe provide additional protections for bicyclists traveling along Wilfred Avenue between Hwy 101 and Stony Point Road. This proposal could include additional signalization, further delineation of the existing Class II bikeway, or improvement of the existing bikeway beyond current Sonoma County Bicycle and Pedestrian Plan such as development of a protected Class I bikeway.* A1-36

Specific Comments:

Aesthetics – Section 4.2

The analysis does not appear to use a well-established, published methodology for evaluating aesthetics in coming to its conclusion that there would be a less than significant impact to viewsheds and other aesthetic considerations. It is recommended that the analysis use the County of Sonoma's Visual Guidelines, or comparable visual guidelines from another recognized source, so that results of the analysis of this project are comparable to other projects in the County. A1-37

Air Quality – Section 4.3

Construction. The TIER should include standard construction air quality mitigation measures. Some of these appear to be included in the Best Management Practice Section (3.2.3, p. 19-20). If these are proposed as measures which will reduce construction impacts to less than significant then this connection should be clearly made. Construction hours should specify summer versus winter hours. Hours should be reduced on Saturday and generally avoided on Sundays. Typical standards for this would be M-F 6am to 10pm, Saturday 6am to 4:30pm, no operations on Sundays and National Holidays. TIER and BMPs proposed in Section 3.2.3 should state that fugitive dust emissions are not allowed to leave the site and appropriate measures will be taken to comply with the appropriate air quality standard. A1-38

Operation. The project, using the CalEEMod estimation procedure, will result in more than trivial new emissions for conventional air quality pollutants, primarily from new area and mobile (vehicle) sources (7.12 tons ROG, 6.61 tons NO_x 6.57 tons PM_{10}, 1.86 tons $PM_{2.5}$). It is argued that these direct impacts are less than significant because they are under a 100 ton per year *de minimis* threshold. The TEIR similarly concludes that these emissions will not cause cumulative impacts because they are below the *de minimis* direct impact thresholds (Impact 4.3-3, p. 46; 4.15.3, p. 142). This circular reasoning is not an acceptable analysis. It does not follow that because annual emissions are below annual *de minimis* thresholds, that the cumulative emissions impact either annually, or over the operating life of the facility, are not significant. A1-39

Biological Resources – Section 4.4

The TIER states, "Assessment of off-reservation biological resources was based on biological resources surveys conducted to document existing habitat types and determine the potential for occurrence of special status species. AES biologists have conducted surveys on and in the vicinity of the BSA [biological study area] since 2004." However, the survey dates, methods and results are not summarized in the TIER nor are the actual reports attached as appendices. Therefore, it is not possible to complete an evaluation the Impact Analysis (4.3.3) for biological resources in the BSA. That said, because the project will be constructed completely within the existing development footprint, conversion of new habitats or plant communities and direct impacts to rare, listed or special concern species appear to be much less likely. Absent a review of the actual biological assessments performed, the following specific comments are provided: A1-40

- The key mitigation measure/BMP for California Tiger Salamander (CTS) is the installation of a well-designed, properly installed, and regularly maintained silt fence around the perimeter of the construction areas. Figure 8 (p. 53) shows a single line of fence on the west side and east A1-41 side of the existing facility, a partial silt fence on the side that appears to have a gap at the southwest corner of the existing facility, and no silt fence along the north property line. A1-41 (Cont.)

- Recommendation: the gap at the southwest corner should be closed. In addition, secondary wattle and silt fences should be deployed in the interior of the site around each of the new facility construction areas. A1-42
- Recommendation: an inspection and maintenance plan should be developed such that the integrity of the CTS exclusion fencing is maintained during the CTS movement/breeding season (February through May) with at least weekly inspections. A1-43
- Recommendation: a biological monitor should inspect the construction areas and fence perimeter at least weekly during movement/breeding season. A1-44

- There are multiple wetlands and ponds within the interior and adjacent to the existing facility. Redundant sediment and stormwater protection BMPs should be deployed around these resources in addition to the perimeter silt fence, e.g., secondary silt fence or multiple wattle lines in arcs around the sides of the wetlands facing the facility and construction area. The SWPPP should clearly show how storm water run-off during construction is directed away from existing avoided wetlands and other aquatic habitats. A1-45
- Nesting bird surveys should be performed no earlier than five (5) days before construction is initiated (not 14 days) and should include all bird species and not just raptors. A1-46
- In the potentials table on page 58 it states that the "The BSA does contain suitable habitat" for western pond turtle (*Emys marmorata*). This is clearly not correct. This area of the Santa Rosa Plains is well within the distribution of this species and abundant habitat in wetlands, ponds, and channelized streams are present which are habitat for this species. There is a known western pond turtle occurrence less than 1.5 miles from the existing facility. A1-47
- The TEIR states (4.4-1, p. 60) that no special status plant species have been observed in the BSA during surveys, and thus special-status plants are presumed absent. The TEIR should provide survey methods, dates, and results that support this statement. Given the sites general location in the heart of the Santa Rosa plains, the statement that "plants are presumed absent" is not well supported. At best, what can be concluded, assuming adequate surveys have been performed, is that listed plants have not been located within the BSA and the nearest known occurrence is X feet or miles away. However, habitats for these species are present and it cannot be concluded they are not present, hence the use of BMPs as mitigation measures. A1-48

Geology and Soils – Section 4.5

No Comments. A1-49

Greenhouse Gas Emissions – Section 4.6

Direct greenhouse gas emissions (equipment, energy, and mobile sources) were estimated using CalEEMod, a standard program that is commonly used in California. Approximately 8,055 CO_2 equivalents per year (CO_2e/year)[1] or which is equivalent to 8,055 metric tons of CO_2 per year. Depending on the source, a single-family residence can produce on average about 7.5 CO_2e, so annual GHG emissions from the proposed expansion is roughly equivalent to the emissions from nearly 1100 single family residences or 1750 automobiles (at 4.6 CO2e) per year. A1-50

[1] A **carbon dioxide equivalent** or **CO_2 equivalent** is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential. The main difference between CO2 and CO2e is that CO2 only accounts for carbon dioxide, while CO2e accounts for carbon dioxide and all other other greenhouse gases as well, e.g., methane, nitrous oxide, etc.

Of the 8,055 CO_2e estimated to be emitted, most is attributable on-site energy use (1,755 CO_2e) and vehicle miles traveled (6,115 CO_2). The TIER concludes without providing quantitative estimates that various measures like use of clean fuel vehicles, low flow appliances, energy efficient lighting, waste reduction and diversion and the possible installation of roof top solar arrays would presumably offset these increased emissions and supports the overall conclusion that GHG emissions would be less-than-significant (4.6.3). Similar to the circular reasoning for air pollutants, it similarly concludes, with no analysis, that the project will not have cumulative GHG impacts (4.15.3, p. 143). Given the aggressive state and county goals for carbon neutrality in the next few decades, a robust and quantitative GHG evaluation demonstrating the carbon neutrality of the project would appear to be warranted to understand the impact of the project on the region. A1-50 (Cont.)

The project should quantitatively' demonstrate that it will have net zero GHG emissions through the implementation of measures that are specified and committed to in required mitigations for the TEIR.

Hazards and Hazardous Materials – Section 4.7

No Comments. A1-51

Water Resources – General

For site-specific improvements, Sonoma Water staff recommend that the drainage design for the project comply with Sonoma Water's Flood Management Design Manual.
https://www.sonomawater.org/fmdm.
Sonoma Water has flood control responsibilities for portions of Hinebaugh Creek, Bellevue-Wilfred channel, and the Laguna De Santa Rosa. Sonoma Water is concerned with any activity that may affect the operation and maintenance of these facilities. Sonoma Water staff request that the Tribe please provide design plans when they become available for review, which show details of the development in or adjacent to Sonoma Water property. We can make Sonoma Water staff available for questions regarding flooding and drainage issues. A1-52

Water Resources – Section 4.8

Groundwater
The Draft TEIR identifies potential impacts to groundwater conditions within the Santa Rosa Plain Subbasin (Subbasin) associated with the projected increase in water demands from an existing average of 205 acre-feet per year (AFY) to a projected average of approximately 377 AFY. Should the water demands associated with the project be met using groundwater supplies, the potential impacts identified within the TEIR include causing "a net deficit in aquifer volume or a lowering of the groundwater level" and "An increased radius of influence would be expected and potentially have a negative effect on nearby wells in the immediate vicinity of the Resort." A1-53

As a member agency of the Santa Rosa Plain Groundwater Sustainability Agency (GSA), Sonoma Water encourages the Tribe to pursue the mitigation measure recommended in the TEIR of purchasing recycled water from the City of Rohnert Park to offset the need to pump groundwater from the Subbasin to the fullest extent feasible. The Tribe should also consider funding projects that reduce groundwater demands and supplement groundwater supplies through recharge enhancement to offset any projected water demands associated with the project which can't be met through recycled water deliveries. Applicable projects identified within the Groundwater Sustainability Plan (GSP) and currently being pursued by the GSA include a Water-Use Efficiency (WUE) Assessment and Pilot Program for groundwater users and planning and implementation of Aquifer Storage and Recovery (ASR) projects. A1-54

Surface Water. The current facility is largely hardscaped with parking lot and rooftops of the existing buildings. According to the TEIR stormwater from the existing facility flows southwesterly into previously installed bioswales and then into a detention basin with a capacity of approximately 18 acre-feet. The detention basins then overflow to Labath Creek, a channelized stream that flows into Hinebaugh Creek approximately 1750 foot from the southwest corner of the existing resort facility. Hinebaugh then debauches into the mainstem of the upper Laguna de Santa Rosa, a short distance from its junction with Labath Creek (approximately 1900 feet). A1-55

The existing resort facility was largely constructed by 2013 with additions in 2016. Its stormwater management system would have presumably been largely designed to standards of well over a decade ago (at least two MS4 Phase 1 permit cycles ago). If this was a project located in unincorporated Sonoma County, it would be subject to the new construction/reconstruction standards of the current Phase 1 MS4 Permit and the most recent version of the Low Impact Development Manual in terms of volume detention and water quality treatment requirements. It is proposed that the project be designed as if those requirements legally apply to it and provide for review and comment of the various construction and post-construction sediment and stormwater management plans and facilities by Permit Sonoma.

Wastewater. Wastewater from the existing and proposed expanded resort facility is discharged to Rohnert Park's sanitary sewer system and ultimately treated at the Laguna Wastewater Treatment plant operated by the City of Santa Rosa. The Existing Resort generates approximately 132,000 gallons of sanitary wastewater per day which the TEIR projects to increase by 124,000 gallons for a total of 257,000 gallons per day. The existing Joint Exercise of Powers Agreement between the Tribe and the City of Rohnert Park provides that up to 410,000 gallons per day may be discharged to Rohnert Park's sanitary sewer system. Therefore, it appears that there would be no significant impact to wastewater management from the proposed project. A1-56

Ground Water/Water Supply. The existing facility's water supply is provided by two water supply wells (at 650 and 680 feet depth) with a combined maximum estimated yield of 900 gallons per minute (gpm) or approximately 1.2 million gallons per day. The TEIR states that the existing facility uses an average of 183,000 gpd (about 130 gpm) and a maximum of 241,000 gpd (about 170 gpm), and this would increase at the proposed expanded facility to 337,800 gpd (about about 230 gpm) on average with a maximum of 418,900 (about 290 gpm). The original EIS for the existing facility used a maximum estimate of 200 gpm (about 323 acre-feet per year) for its analysis.

Groundwater use and impact was extensively discussed in Appendix E of the TEIR. The existing and proposed facility uses are summarized below: A1-57

	MG (10^6 gal)	Acre-Feet	
Existing Facility	67.1	206	
Proposed Expansion	56.2	172	
TOTAL	123.3	378	
Percent Increase		83.7%	
Analyzed in Original EIS (@200gpm)	105	323	
Percent Difference		14.5%	
Recycled Water Potential	MG (10^6 gal)	Acre-Feet	Percent of Total Use

Existing Facility	45.2	139	67.5%
Proposed Expansion	32.9	101	58.7%
TOTAL	78.1	240	63.5%

A1-57 (Cont.)

The bottom line is that the proposed project will nearly double the current groundwater use at the existing facility, absent substantial recycled water or groundwater recharge mitigation measures being implemented. Total annual ground water use from the proposed project is equivalent to the annual usage of approximately 340 single family residences (assuming 0.5 acre-feet per year); the existing facility annual groundwater use is equivalent to approximately 400 residences.

The executive summary of the groundwater analysis in Appendix E states that the average annual pumping in the Santa Rosa Sub-Basin for the Groundwater Sustainability Plan planning period of 2021-2070 is estimated to exceed the sustainable yield for the basin, absent management interventions (p. 3, Section 1.7). It also states that,

> Due to the anticipated increase in demand to greater than 200 gpm [to 235 gpm or 337,800 gpd], the following mitigation measures may be considered to address potential groundwater impacts: reduce demand through installation of Energy Star rated low-flow fixtures for bathroom faucets in the expansion area [i.e., the hotel or restroom facilities]; initiate recycled water use at the Resort to partially or fully offset the increased ground water use due to the proposed expansion; provide recharge of the groundwater basin through use of leach fields or other underground injection methods…; and, continue implementation of the Groundwater Monitoring Program.

(p. 3-4, Section 1.8). In terms of environmental impacts, the Executive Summary concludes,

> Greater pumping rates to meet the projected 46% water demand increase due to the proposed expansion may contribute to impacts to groundwater levels. An increased radius of influence would be expected and potentially have a negative effect on nearby wells in the immediate vicinity of the Resort.
>
> The reuse of recycled water, either through purchasing of external sources, or through on-site wastewater treatment, would reduce impacts to the groundwater basin to below the initially targeted well demand of (200 gpm) established as part of the original EIS and potentially below current well demands.
>
> Recycled water use should be implemented to reduce overall impacts from groundwater withdrawals. A connection to the City's recycled water distribution network would be the least costly alternative.

A1-58

(p. 5, Section 1.10).

Given the overall and projected condition of the Santa Rosa Plains Sub-Basin, and the conclusions of the TEIR's groundwater experts, the County believes that the final TEIR should, at minimum, commit to a net-zero impact for the proposed expansion's ground water use through implementing recycled water use, groundwater recharge, or a combination thereof, in order to reduce the impact to less than significant with required mitigation measures.

Land Use – Section 4.9

The TEIR at 4.9-1 states that the Proposed Project could conflict with an off-reservation land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating an environmental effect. A1-59

The Proposed Project is in an agricultural area per the Sonoma County General Plan. However, the new development is consolidated within the bounds of land already disturbed and developed with infrastructure so this is the best case location for such a development within the site. The County requests that FIGR consider this in its analysis.

The TEIR at 4.9-2 states that the Proposed Project could conflict with an applicable habitat conservation plan or natural community conservation plan covering off-reservation land.

While not an adopted Habitat Conservation Plan, the Santa Rosa Plain Conservation Strategy Area contains guidance for development within area known to host the California Tiger Salamander. The consolidation of development within already developed areas on the site and implementation of the Biologic Resources mitigation measures meets the intent of the guidance within the Area. The County requests that FIGR consider this in its analysis. A1-60

Noise – Section 4.10

To the extent the rooftop restaurant is utilized for entertainment or in conjunction with amplified sound, there is the potential for off-site noise impacts beyond current operations which do not involve such activities. This potential should be explicitly analyzed to determine if there is an impact. The TEIR concludes without clear analysis that other project components such as the pool, casino floor, and restaurant would similarly not generate noise levels in excess of existing on-reservation noise levels, but does not specify what "restaurant" refers to or if restaurant use is indoor, or outdoor. A1-61

Population and Housing – Section 4.11

The discussion in the TEIR of current housing environment states that in 2022 the average vacancy rate throughout Sonoma County jurisdictions was 8.4%. This figure, however, does not take into account seasonal, recreational, or occasional use residences. When those are factored in, the vacancy rate in the County is about 1%. The low vacancy rate drives up costs and makes it extremely difficult for residents to find housing, particularly affordable housing. The TEIR states that the Proposed Project would employ 2,000 people during construction on a temporary basis, and 500-600 people on an ongoing basis for operations. While some of these employees may reside locally, the TEIR inaccurately concludes that housing is available if relocation must occur. A1-62

The County recommends that the Resort provide additional affordable units to mitigate the impact of the Proposed Project on housing availability.

Public Services – Section 4.12

The County appreciates that the TEIR includes the opportunity to address proportional impacts of the project 4.12-1 through amendments to city and county agreements. However, the full extent of public services was not addressed in the TEIR. Public Services should be further evaluated to include the use local law enforcement and fire service. Fire services should be further evaluated to support an efficient, effective regional approach to fire services. A more complete and robust analysis would form the A1-63 foundation of facts necessary to accomplish the goal of addressing proportional impacts of the project. This would also be true regarding the County's above comments on groundwater, wastewater, surface water and stormwater management. A1-63 (Cont.)

Transportation and Traffic – Section 4.13

In addition to the traffic areas listed under the Draft TEIR recommended mitigation measures, we request inclusion of the Stony Point Road at Millbrae Avenue intersection and the impacts to Hwy 116 in the traffic analysis. The County is experiencing additional traffic at this location and would like to understand the impacts. A1-64

Utilities and Service Systems – Section 4.14

See earlier comments on groundwater, wastewater, surface water and stormwater management. A1-65

received
2/1/2023 MR

ROHNERT PARK
1962
CALIFORNIA

City Council

Samantha Rodriguez
Mayor

Susan Hollingsworth Adams
Vice Mayor

Jackie Elward
Gerard Giudice
Emily Sanborn
Councilmembers

Marcela Piedra
City Manager

Don Schwartz
Assistant City Manager

Michelle Marchetta Kenyon
City Attorney

Sergio Rudin
Assistant City Attorney

Cindy Bagley
Director of Community Services

Jamie Cannon
Director of Human Resources

Vanessa Garrett
Director of Public Works

Sylvia Lopez Cuevas
City Clerk

Tim Mattos
Public Safety Director

Mary Grace Pawson
Director of Development Services

Leo Tacata
Finance Director

January 31, 2023

Federated Indians of Graton Rancheria
Attn: TEIR Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: City of Rohnert Park Letter in Respect to the Casino Expansion Project Tribal Environmental Impact Report (TEIR)

The City of Rohnert Park welcomes the decision of the Federated Indians of Graton Rancheria (Tribe) to further enhance our communities through additional development of their land. The City is committed to continue its collaboration and partnership with the Tribe for the benefit of our communities. The City is excited to see the anticipated commercial and economic growth presented by the proposed project, which includes additional hotel rooms, expanded casino floor, rooftop restaurant, expanded swimming pool area, back of house, mezzanine and support space, additional parking structure, theater, storm water detention modifications, re-alignment of Labath Avenue within the existing casino parking lot, and modifications to the existing on-site central plant (Expansion Project). The City submits these comments on the *Draft Tribal Environmental Impact Report for the Graton Resort & Casino Expansion* (Draft TEIR) dated December 2022 for the Tribe's consideration. A2-01

The Draft TEIR is clear and consistent with the analyses included in environmental impact reports prepared, and certified by, the City for the Northwest Specific Plan and Wilfred-Dowdell Specific Plan (City Certified EIRs), near the Expansion Project. Accordingly, it is with this unique perspective that the City offers the following comments to enhance the analysis contained in the Draft TEIR as an informational document to support informed decision making by the Tribe in relation to the Expansion Project.

Best Management Practices (Section 3.2.3)

The City concurs with the best management practices (BMPs) that the Tribe put together, presented in Section 3.2.3 of the Draft TEIR. These BMPs are consistent with many of the measures that the City has adopted in the City Certified EIRs to support development in this geographic area. Enclosed for your consideration, as Attachment 1, is a list of BMPs that (i) are discussed in the Draft TEIR but were not captured as BMPs in Section 3.2.3, (ii) are discussed in the Draft TEIR to address potential impacts but are not identified as mitigation measures, and (iii) are suggested by the City for future collaboration based on the City's perspective of effective ways to enhance the development. The City requests that the Tribe consider adding the items outlined in Attachment 1 as additional BMPs within the current list set forth in Section 3.2.3. A2-02

Water Resources (Section 4.8) and Utilities and Service Systems (Section 4.14)

The Tribe and the City are parties to a number of agreements that support the ongoing operation of the existing casino and hotel facilities with the shared goal of ensuring its safe and reliable operation while being mindful of health and safety needs for employees, patrons, and other parts of the community. One of those agreements is the Joint Exercise of Powers Agreement, dated as of June 26, 2012, and effective as of July 23, 2012, regarding, among other matters, the provision of wastewater services and recycled water service to the Existing Facility (Wastewater JEPA).

As noted in greater detail in Attachment 2, the City's comments focus on the need to amend the Wastewater JEPA with the Tribe, in order to clearly secure available wastewater capacity needed to serve the Expansion Project. Further, the City notes its strong support to collaboratively pursue revisions to the Producer-Distributor Agreement between the City and the City of Santa Rosa in order to secure an additional supply of recycled water for the Tribe's use on its Reservation. As noted in Attachment 1, the City recommends adding a BMP to the project description that clarifies the intent and desire of the Tribe to work with the City to amend the Wastewater Joint Exercise of Powers Agreement, for the reasons noted here, which the City is committed to complete with the Tribe. A2-03

The City also notes in Attachment 1, for the Tribe's review and consideration as a BMP, measures set forth in the Santa Rosa Groundwater Sustainability Plan (Plan) (https://santarosaplaingroundwater.org/gsp/) designed to mitigate the impact of increased groundwater pumping on the basin, including various recharge strategies, and encourages the Tribe to consider the implementation of feasible measures. Lastly, the City has noted that the proposed low impact development (LID) features identified in Appendix D to the Draft TEIR are sized according to requirements within Contra Costa County, which is governed by the San Francisco Bay Regional Water Quality Control Board (SF RWQCB). The majority of Sonoma County, including the City, is subject to the storm water permitting requirements of the North Coast Regional Water Quality Control Board (NC RWQCB), and their requirements are different to those of the SF RWQCB. Further, it appears that there are no LID features proposed for the Expansion Project; however, because storm water from the Expansion Project appears to be designed to discharge to the City's storm water facilities, we will need to review these details with the Tribe in order to ensure compliance with the City's permit with NC RWQCB. Accordingly, the City has identified additional BMPs in Attachment 1 for the Tribe's consideration, with the intent of advancing shared goals of conserving natural resources by minimally increasing groundwater withdrawal on the basin and protecting our local streams and rivers from pollution. A2-04

Population and Housing (Section 4.11)

The City truly appreciates the support that the Tribe has given the community to help create opportunities for those that are underrepresented and experiencing housing challenges. Accordingly, the City appreciates the Draft TEIR's acknowledgement that mitigation fees provide a mechanism for supporting the "fair share" construction and operation of affordable housing, an approach that the City has implemented with the adoption of the Affordable Housing Linkage Fee. As noted in Attachment 1, the City recommends adding a BMP to the project description that clarifies the intent of the Tribe to continue its support towards the development of affordable housing in the region and thereby mitigate the impact of development on low income housing. It is also recommended that Section 4.11.1 Regulatory Setting of the Draft TEIR be updated to reflect the current, published regional housing needs allocation (RHNA) for Sonoma County and the City as follows: A2-05

> Regional housing needs allocation (RHNA) for Sonoma County and Rohnert Park, which illustrate the state's regulatory mandate for the County and City to increase the available housing stock. The City and County's adopted RHNA is presented below, by income category.

Jurisdiction	Very Low-Income Units	Low Income Units	Moderate Income Units	Above Moderate-Income Units	TOTAL
Unincorporated Sonoma County	1,024	584	627	1,589	3,824
City or Rohnert Park	399	230	265	686	1,580
	1,420	814	892	2,275	5,404

A2-05 (Cont.)

Public Services (Section 4.12)

The City has entered into mutual aid agreements with the County to ensure effective response throughout both service areas under all staffing circumstances. Additionally, Rohnert Park Fire Station No. 3 (Station No. 3), is located less than ¾ of a mile from the site of the proposed Expansion Project, which will positively aid in effective responses to calls for service at the Resort by Rohnert Park Public Safety personnel. With the mutual aid agreements and the relative proximity of Station No. 3 to the Resort, the calls for service are likely to increase with the Expansion Project, and Rohnert Park Public Safety, in collaboration with the County and the Tribe, look forward to maintaining effective and meaningful services to the Resort. A2-06

As we work together to provide the best service possible to the Expansion Project, it is important that the City and the Tribe continue to discuss and collaborate on the best methods to effectively address operational effects as they are brought to everyone's attention. Accordingly, the City is appreciative of the Tribe's commitment, reflected in Mitigation Measure 4.12-1, to extend and amend, as needed, existing agreements with the City to support public safety services needed to provide positive outcomes as a result of new development and growth. A2-07

Transportation (Section 4.13)

The City is appreciative of and recognizes the significant contributions made by the Tribe towards the existing circulation infrastructure in and around the area of the proposed Expansion Project. Those improvements have created an environment that is safe and efficient for all modes of travel. The City and Tribe have a shared interest in preserving the effective operation of the circulation system in the vicinity of the proposed Expansion Project for the benefit of our communities. We look forward to working together to explore solutions to maintain that experience and to enhance our network of roads, paths and trails serving all modes of transportation to the Expansion Project and the broader community. Our discussion points on transportation are focused on ensuring that efficient circulation can continue to be successful with the proposed Expansion Project.

In anticipation of collaborating on the most effective way to ensure reliable traffic flow in the area, the City commissioned an independent traffic study for the Expansion Project, a copy of which is enclosed as Attachment 5. The City's study concluded that the estimates of weekday and p.m. peak hour trip generation similarly match those set forth in the Transportation Impact Study (TIS) prepared for the Draft TEIR. The study also evaluated the concert venue specifically, and the City requests an opportunity to explore proposed measures related to events at the theater, as set forth in Attachment 1. The City wants to ensure that a patron's experience at the venue is not negatively influenced by an inefficient and congested system of ingress and egress to and from the concert venue. The City believes the current traffic signal system is not sufficient to adequately or effectively accommodate all of the patrons anticipated to be frequenting the concert venue, but with the implementation of temporary measures during events at the theater, described in Attachment 1, smooth traffic flow can be maintained. A2-08

The City's study also modeled week day and weekend trip generation with the intent of best supporting the Expansion Project's transportation needs. This evaluation revealed that the background traffic A2-09 forecasts used in the TIS are based on growth rates and signal timing assumptions which would not necessarily reveal the "worst-case scenario" of Expansion Project traffic. Using data from either the TIS or the City's study illustrates that Level of Service (LOS) D and E conditions can be expected under the cumulative conditions. Accordingly, in addition to the implementation of the BMP to create a successful theater plan, the City requests that the scope of Mitigation Measure 4.13-1 be modified as described in Attachment 3, and stands ready to discuss the details and share in the cost of these vital improvements. A2-09 (Cont.)

The City appreciates the opportunity to present these comments to the Tribe, which are provided with the intent to support the Expansion Project and its certain success. We look forward to the opportunity to discuss and explore these matters further with the Tribe in the spirit of creating a comprehensive environmental program that protects and preserves our shared environment for future generations.

Respectfully yours,

Mary Grace Pawson, Development Services Director

C: Marcela Piedra, City Manager

Attachments:

1. Best Management Practices (Section 3.2.3 of Draft TEIR)
2. Water Resources (Section 4.8)
3. Transportation (Section 4.13)
4. Existing City Easement for Sanitary Sewer Facilities
5. W-Trans - Traffic Impact Study – Review of the Graton Resort & Casino Expansion (January 12, 2023)

ATTACHMENT 1

BEST MANAGEMENT PRACTICES

(Section 3.2.3 of Draft TEIR)

Based on the City's review of the Draft TEIR, the City requests that the Tribe consider adding the items listed below as additional BMPs within the current list outlined in Section 3.2.3.

Air Quality

- With implementation of proposed off-reservation improvements to the circulation system, off-reservation intersections will not operate at unacceptable Level of Service (LOS) E or F, thereby minimizing the potential that sensitive receptors will be subject to substantial pollution impacts (described on TEIR page 46)

Biological Resources

- The Draft TEIR does not consider off-reservation construction impacts. The off-reservation improvements to the circulation system will be completed consistent with the mitigation measures adopted by the City of Rohnert Park for its Northwest Specific Plan and Wilfred Dowdell Specific Plan in order to mitigate off-reservation construction impacts.

Geology & Soils

- Excavated soil will be disposed of on-reservation through balanced cut and fill (TEIR page 67)
- The Tribe will secure and comply with the General Construction NPDES permit and will prepare and implement a Storm water Pollution Prevention Plan for both on and off-site project improvements. (TEIR page 67)

Greenhouse Gas (GHG) Emissions

- Proposed project will comply with strategies currently identified by the State of California in the CARB Updated 2020 Scoping Plan (TEIR page 75)
- Power will be purchased from Sonoma Clean Power's Evergreen Program (this will eliminate GHG emissions associated with electrical use at the Expansion Project and reduce quantified impacts) (TEIR Table 4.6-1) A2-10
- Wastewater service is through the City of Rohnert Park and the Santa Rosa Subregional System, both of which purchase power through the Evergreen Program (this eliminates GHG emissions associated with wastewater service) (TEIR Table 4.6-1)
- Tribe shall consider an all-electric expansion that does not rely on additional natural gas service to the site (this will reduce GHG emissions associated with expanded operations) (TEIR Table 4.6-1)

Hazards and Hazardous Material

- Tribe will continue to update and maintain its Hazardous Material Management Plan (TEIR page 79)
- Tribe will implement the following standard operating procedures
    - To reduce the potential for accidental releases, fuel, oil, and hydraulic fluids shall be transferred directly from a service truck to construction equipment and shall not otherwise be stored on the project site. Paint, thinner, solvents, cleaners, sealants, and lubricants used during construction shall be stored in a locked utility building, handled per the manufacturers' directions, and replenished as needed.
    - In the event that contaminated soil and/or groundwater or other hazardous materials are encountered during construction-related earth-moving activities, all work shall be halted until a qualified individual can assess the extent of contamination. If contamination is determined to be significant, representatives of the Tribe shall consult with the USEPA to determine the appropriate course of action, including the development of a sampling plan and remediation plan if necessary.
    - The amount of hazardous materials used in construction and operation shall be kept at the lowest required volumes.

  - The least toxic material capable of achieving the intended result shall be used to the extent practicable. Non-toxic alternatives shall include garden care products and organic non-toxic cleaners when feasible.
  - Personnel shall follow written standard operating procedures for filling and servicing construction equipment and vehicles. (TEIR page 79 and following)
- Tribe will implement its construction Phase Storm water Pollution Prevention Plan (TEIR page 80)

Water Resources

- Tribe will work with the City of Rohnert Park to amend the Joint Exercise of Powers Agreement for Wastewater Services to extend the timeframe under which the Tribe may purchase "Phase 2" sewer capacity, as necessary to serve the Expansion Project, and to pursue amendments to the Producer/Distribution Agreement between the City and the City of Santa Rosa to obtain an additional supply of recycled water from the Santa Rosa Subregional Sewage System, which could then be available for transport to the Tribe for the Tribe's use on the Reservation. Although this is not guaranteed that the city has additional capacity for recycled water, we will work with the tribe on this effort.

- Tribe will review and consider implementation of measures set forth in the Santa Rosa Groundwater Sustainability Plan designed to mitigate impacts of increased groundwater withdrawal on the basin.

- To the extent required, Tribe will work with the City to comply with the North Coast Regional Water Quality Control Board storm water permitting requirements, including entering into a master maintenance agreement with the City governing the maintenance of LID features designed to capture and treat storm water discharges from the Tribe's Reservation prior to discharge into the City's storm water system.

A2-10
(Cont.)

Public Services

- As reflected in Mitigation Measure 4.12-1, the Tribe will work with City and County to extend and amend, as needed, existing agreements to provide funding to support public safety services and thereby mitigate the impact of the Expansion Project on these services. (TEIR pages 119 - 123)

Population and Housing

- Tribe will work with City and County to extend and amend, as needed, existing agreements to provide funding to support the development of affordable housing and thereby mitigate the impacts of development on the supply of low income housing (TEIR page 115).

Utilities and Services

- Design of all buildings and project features will avoid the City's sewer main and utility easement described in Document Number 2012133132 recorded with the Sonoma County Recorder. Design and operation of the Project will not impede the City's ability to utilize its sewer main or access its easement in order to perform regular maintenance and emergency repairs, specifically including sufficient aerial clearance for construction equipment to access the easement area and perform needed repairs, maintenance and replacement (a copy of the recorded easement is enclosed as Attachment 4 for the Tribe's reference).

Transportation

- In order to mitigate circulation impacts resulting from theater events, pursuant to an agreement with the City, the Tribe will implement the following program in connection with events at the theater:
  - Unless and until a traffic signal is installed at the Golf Course Drive West/Labath Avenue and Business Park Drive/Dowdell Avenue intersections, provide manual traffic control at each intersection during events at the theater pursuant to (i) an encroachment permit issued by the City to the Tribe and a private traffic control contractor approved by the City, or (ii) the

provision of traffic control services provided by its public safety officers, the cost of which shall be reimbursed by the Tribe. A2-10 (Cont.)

- Provision of additional traffic control officers detailed to respond to traffic issues that may arise during events at the theater, the cost of which shall be reimbursed by the Tribe.
- Provision of City personnel detailed to actively monitor and adjust the traffic signal systems during events at the theater, the cost of which shall be reimbursed by the Tribe.

ATTACHMENT 2

WATER RESOURCES (Section 4.8)

Section 4.8 - Water Resources

Section 4.8.2 – Wastewater Facilities (beginning on page 87). This section should be updated to clarify that while the Joint Exercise of Powers Agreement for Wastewater Services (Wastewater JEPA) allots up to 410,000 gallons of average daily wastewater collection and treatment capacity for the Tribe's operation, the Tribe has only exercised its right to purchase 200,000 gallons of average daily capacity (the "Phase 1" capacity). In accordance with Section 5.2.1(b) of the Wastewater JEPA, the Tribe's option to purchase the additional, "Phase 2" capacity has expired. Section 5.2.1(b) provides that this expiration date may be extended through amendments to the Wastewater JEPA and the City is amenable, in connection with the Expansion Project, to extend the Tribe's option to purchase some or all of the "Phase 2" capacity in accordance with the terms of the Wastewater JEPA. As noted in Attachment 1, the City recommends adding a BMP to the project description that clarifies the intent to amend the Wastewater JEPA so that the Tribe has the option to purchase additional allotment(s) of wastewater capacity. A2-11

Section 4.8.3 – Impact Analysis: Impact 4.8-2 (groundwater supplies, beginning on page 89). In general, the City supports the expansion of the existing recycled water system as the most efficient way to utilize existing infrastructure to offset the impacts of new groundwater demands. As outlined in our response to the Tribe's Notice of Preparation, the City believes that this could be accomplished with some modifications to the City's *Producer-Distributor Agreement* with the City of Santa Rosa (Santa Rosa) and the City stands ready to work with the Tribe and Santa Rosa to negotiate these modifications. As noted in Attachment 1, the City recommends adding a BMP to the project description that clarifies the intent to amend the Wastewater JEPA to pursue modifications to the *Producer-Distributor Agreement* so that the Tribe has access to recycled water. The City strongly supports the connection to the existing recycled water system as the most efficient option outlined in the TEIR. A2-12

Section 4.8.3 – Impact Analysis: Impact 4.8-5 (polluted runoff, beginning on page 92 and including Appendix D). Based on the City's review of the Draft TEIR, Appendix D - Grading and Drainage Study, storm water run-off from the site of the proposed Expansion Project will be discharged to the bioswale located to the north of the Expansion Project on Wilfred Avenue (Golf Course Drive West) and to Labath creek to the south, both of which are storm water facilities maintained by the City. The proposed low impact development (LID) features identified in Appendix D are sized according to "Contra Costa" sizing requirements. Contra Costa County is governed by the San Francisco Bay Regional Water Quality Control Board's storm water permitting requirements which are not applicable to the City of Rohnert Park's storm water system. The majority of Sonoma County, including the City of Rohnert Park, is subject to a different set of requirements promulgated by the North Coast Regional Water Quality Control Board. Prior to commencement of construction of the Expansion Project, calculations will need to be revised to reflect the requirements of the current local LID Manual. In addition, the proposed Final Water Quality Management Plan does not reflect current regulatory requirements. Accordingly, additional onsite detention and trash capture devices will be required for any area that drains into the City's storm water system. Further, the North Coast Regional Water Quality Control Board requires that all entities that discharge into the City's municipal storm water system enter into a master maintenance agreement with the City governing the maintenance of their LID features. Due the mandates of the North Coast Regional Water Quality Control Board and the resulting penalties sustained by the City for permit violations, the City must insist upon the addition of a BMP, as noted in Attachment 1, clarifying the Tribe's commitment to comply with the North Coast Regional Water Quality Control Board storm water permitting requirements, including entering into a master maintenance agreement with the City governing the maintenance of LID features designed to capture and treat storm water discharges from the Tribe's Reservation prior to discharge into the City's storm water system. A2-13

ATTACHMENT 3

TRANSPORTATION (Section 4.13)

Section 4.13.4 Mitigation Measures. The City requests that that Tribe expand Mitigation Measure 14.3-1 to include the following description of improvements to be funded proportionally through an agreement between the City and the Tribe. The City acknowledges that the proposed Expansion Project is not fully responsible for these recommended improvements and that any amended agreement between the City and Tribe should include a commitment to proportional funding by the City and the Tribe and scope and schedule for completing the work.

4.13-1: The Tribe shall amend agreements with the County and the City to address the proposed project's proportional share of the following physical infrastructure improvements aimed at maintaining traffic flow in areas where the casino-resort expansion would generate added traffic during peak and non-peak hours.

- *Complete Dowdell Avenue between Golf Course Drive West and Business Park Drive including the planned signal at Dowdell Avenue and Business Park Drive* A2-14
- *Improve Golf Course Drive West/Redwood Drive Intersection*
  - *Restripe the eastbound right-turn lane to a through/right-turn lane.*
  - *Reposition the bike lane to curbside, adding green bike lane markings.*
  - *Construct a westbound right-turn pocket along a portion of the gas station frontage.*
- *Improve US 101 South Off-Ramp Intersection*
  - *Add a second southbound right-turn lane.*
- *Improve US 101 North Off-Ramp Intersection*
  - *Increase left-turn storage on the off-ramp.*
- *Support the City's Automated Traffic Monitoring System (ATMS) to allow for more flexible control and more responsiveness in signal performance. Monitor and Adjust Signal Systems on Golf Course Drive and Rohnert Park Expressway*
- *Improve Rohnert Park Expressway/Redwood Drive Intersection*
  - *Increase storage in the southbound left-turn pockets on Redwood Drive.*

ATTACHMENT 4

EXISTING CITY EASEMENT FOR SANITARY SEWER FACILITIES

[attached]

2012133132

OFFICIAL RECORDS OF
SONOMA COUNTY
WILLIAM F ROUSSEAU

SONOMA COUNTY
12/27/2012 10:39 RSL
RECORDING FEE: $0.00
PAID

6 PGS

Recording Requested By
and
Return to:

Board of Supervisors
County of Sonoma
575 Administration Drive, Room 100A
Santa Rosa, CA 95403

Document Title(s)

Resolution Of The Board of Supervisors Of The County Of Sonoma, State Of California, To Approve The Petition To Vacate A Portion Of Labath Avenue (Created As Labatt Avenue) As Shown On "Subdivision Of Santa Rosa Farms No. 2," Book 21 Of Maps, Page 14, Sonoma County Records And More Specifically Described In Exhibit A.

#56
Resolution No. 12-0595

County of Sonoma
Santa Rosa, CA 95403

Date: 12/11/2012

Resolution Of The Board Of Supervisors Of The County Of Sonoma, State Of California, To Approve The Petition To Vacate A Portion Of Labath Avenue (Created As Labatt Avenue) As Shown On "Subdivision Of Santa Rosa Farms No. 2," Book 21 Of Maps, Page 14, Sonoma County Records And More Specifically Described In Exhibit A.

Whereas, Division 9, Part 3, Chapter 3 of the California Streets and Highways Code (Section 8300 et seq.) provides a process for a local agency to consider the vacation of public streets, highways, and public easements; and

Whereas, a petition was filed with this Board to vacate all that portion of Labath Avenue (created as Labatt Avenue) generally described as lying south of the southerly right-of-way line of Wilfred Avenue, to its terminus at the north right-of-way line of Business Park Drive, and as more precisely identified in the legal description and map attached hereto as Exhibits "A" and "B"; and

Whereas, notice of the public hearing on the requested vacation was published and posted, and on December 11, 2012, this Board conducted a public hearing, all as required by law; and

Whereas, Division 9, Part 3, Chapter 3 of the California Streets and Highways Code (Section 8300 et seq.) provides that this Board must consider its General Plan before approving any vacation of County right-of-way or interest, and requires that the Board obtain a report from the County Planning Agency on conformity with the General Plan before considering the vacation request; and

Whereas, this Board has reviewed the report of the Permit and Resource Management Department (P.R.M.D.) Comprehensive Planning Division concluding that the vacation is consistent with the General Plan; and

Whereas, after considering the oral and documentary evidence presented at the hearing, this Board determined that Labath Avenue (created as Labatt Avenue) as described in Exhibits "A" and "B", is not necessary for present and prospective public use; and

Whereas, this portion of Labath Avenue (created as Labatt Avenue) may be vacated in the Board determines that the vacation is consistent with the General Plan, and if the right-of-way is unnecessary for present or prospective use.

Whereas, the vacation of Labath Avenue (created as Labatt Avenue) is not a project pursuant to CEQA and its Guidelines and, to the extent it may be held to constitute a project, it is exempt pursuant to CEQA Guidelines section 15061(b)(3).

Now, Therefore, Be It Resolved that the Board of Supervisors finds and determines that all of the facts previously stated are true and correct.

Be It Further Resolved the Board of Supervisors finds that the portion of Labath Avenue (created as Labatt Avenue) described in the attached legal description and shown on the attached maps, Exhibits "A" and "B", is not necessary for present or prospective public use.

Be It Further Resolved that the Board of Supervisors finds that the proposed vacation is consistent with the General Plan.

Be It Further Resolved that the Board of Supervisors finds that the proposed vacation request is in the public interest.

Be It Further Resolved that the petition to vacate a portion of Labath Avenue (created as Labatt Avenue) is approved excepting and reserving therefrom pursuant to the provisions of Section 8340 of the Streets and Highways Code and for the benefit of Pacific Bell Telephone Company doing business as AT&T California, the permanent easement and the right at any time or from time to time to construct, maintain, operate, replace, remove, renew and enlarge lines of pipe, conduits, cables, wires, poles and other convenient structures, equipment, and fixtures for the operation of telegraph and telephone lines and other communication facilities, including access to protect the same from all hazards, in, upon, over, and across the portion of Labath (Labatt) Avenue, north of Business Park to Wilfred to be abandoned.

Be It Further Resolved that the petition to vacate a portion of Labath Avenue (created as Labatt Avenue) is approved excepting and reserving therefrom pursuant to the provisions of Section 8340 of the Streets and Highways Code and for the benefit of Comcast of East San Fernando Valley, L.P., the permanent easement and the right at any time or from time to time to construct, maintain, operate, replace, remove, renew and enlarge lines of pipe, conduits, cables, wires, poles and other convenient structures, equipment, and fixtures for the operation of telegraph and telephone lines and other communication facilities, including access to protect the same from all hazards, in, upon, over, and across the portion of Labath (Labatt) Avenue, north of Business Park to Wilfred to be abandoned.

Be It Further Resolved that the petition to vacate a portion of Labath Avenue (created as Labatt Avenue) is approved excepting and reserving therefrom pursuant to the provisions of Section 8340 of the Streets and Highways Code and for the benefit of the City of Rohnert Park, the permanent easement and the right at any time or from time to time to construct, maintain, operate, replace, remove, and renew sanitary sewers and storm drains and appurtenant structures in, upon, over, and across the portion of Labath Avenue (also known as Labatt Avenue) to be abandoned.

Be It Further Resolved that the Board finds that the vacation is not a project pursuant to CEQA Guidelines sections 15060(c)(2), 15060(c)(3), and 15378 because it does not have the potential for resulting in either a direct or reasonably foreseeable indirect physical change in the environment. In the alternative, to the extent the activity may be held to constitute a project, the Board finds it exempt pursuant to CEQA Guidelines section 15061(b)(3).

Be It Further Resolved that the Clerk of the Board of Supervisors is hereby authorized to send a certified copy of this resolution, attested by the Clerk under seal per Streets and Highways Code Section 8325, to the Office of the County Recorder who is hereby directed to record it.

Be It Further Resolved that from and after the date of recording, the portion of Labath Avenue (created as Labatt Avenue) described in Exhibit "A" shall no longer exist.

Supervisors:

Brown: Aye	Rabbitt: Aye	McGuire: Aye	Carrillo: Aye	Zane: Aye
Ayes: 5	Noes: 0	Absent: 0	Abstain: 0	

So Ordered.

EXHIBIT "A"
Legal Description

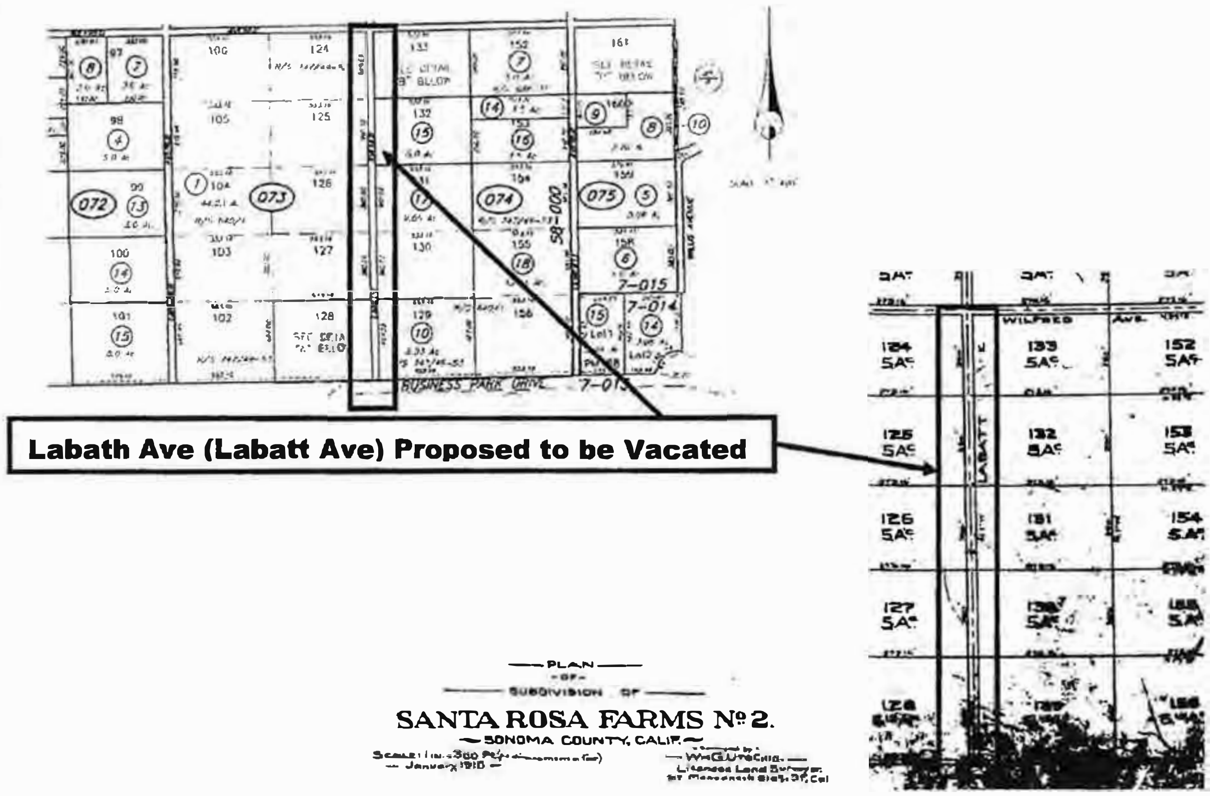
All that portion of the public right-of-way known as Labatt Ave (currently known as Labath Ave) as shown on "Subdivision of Santa Rosa Farms No. 2", Book 21 of Maps, Page 14, S.C.R. lying south of the southerly right-of-way line of Wilfred Ave, also as shown on said map, to its terminus at the north right-of-way line of Business Park Drive as shown on "Rohnert Business Park Subdivision", Book 375 of Maps, Pages 10 and 11, S.C.R. more specifically shown on Exhibit B.

9/11/12

PROFESSIONAL LAND SURVEYOR
GARY J. O'CONNOR
PLS 7272
Exp. 12/31/12
STATE OF CALIFORNIA

EXHIBIT "B"
Site Map

Assessor's Map Bk. 045, Pg. 07
Sonomo County, Calif.



ATTACHMENT 5

W-TRANS - TRAFFIC IMPACT STUDY - REVIEW OF THE GRATON RESORT & CASINO EXPANSION

[attached]

W-Trans

January 30, 2023

Ms. Mary Grace Pawson, PE
Director of Development Services
City of Rohnert Park
130 Avram Avenue
Rohnert Park, CA 94928

Peer Review of the Graton Resort & Casino Expansion Traffic Impact Study

Dear Ms. Pawson;

As requested, W-Trans has reviewed the *Traffic Impact Study: Graton Resort & Casino Expansion Project* report prepared by Abrams Associates, dated October 31, 2022. The traffic impact study (referred to herein as the "TIS") assesses the transportation effects of the proposed expansion of the existing casino-resort, which would include just over 87,000 square feet of new casino floor area with 3,000 additional gaming positions, an additional 221 hotel rooms, and a 97,000 square foot theater with up to 3,500 seats. Following is a summary of our review presented by general topic area. A2-16

Confirmation of Assumptions Using "Big Data" Sources

To confirm the adequacy of assumptions applied in the TIS, W-Trans independently developed estimates of the existing casino resort's vehicle travel characteristics using "big data" sources available through the provider Streetlight Data, which uses anonymized device data (including cell phones, cell phone applications, and connected vehicles) among other sources to estimate real-world traffic volumes. A benefit of using this type of data is that volumes may be estimated using many days of travel data instead of the more typical one to three days of data collected in the field. For the purposes of this analysis, data was obtained from the entire 2019 calendar year (pre-pandemic conditions) for typical weekdays (Mondays through Thursdays), Fridays, Saturdays, and Sundays. The following types of travel characteristics were obtained during the review. A2-17

- Trip generation
- Proportions of traffic volumes entering and exiting the casino-resort's collective four access points to the public street network
- Typical traffic volumes on Golf Course Drive West between the casino-resort and Redwood Drive
- Select origin-destination data on the local roadway network
- Estimated trip lengths

Existing Casino-Resort Trip Generation

Based on the review of 2019 data, the existing casino-resort generated approximately 12,130 daily trips on weekdays (Monday through Thursday), including 260 during the a.m. peak hour and 760 during the p.m. peak hour. The Friday daily trip generation was approximately 14,500 trips including 810 during the p.m. commute peak hour, and a maximum hourly trip generation of 1,330 trips between 8:45 and 9:45 p.m. The Saturday trip generation was approximately 18,410 trips per day with a peak of 1,330 trips between 9:15 and 10:15 in the evening. Sundays had the highest trip generation of the week with 21,970 daily trips, including 1,450 during the highest peak hour between 2:00 and 3:00 p.m. A summary of the estimated 2019 casino resort trip generation is shown in Table 1. Charts showing how the casino-resort's trip generation levels fluctuate throughout daily 24-hour periods by day of week are enclosed. A2-18

Table 1 – Estimated Existing Graton Casino Resort 2019 Trip Generation				
Trip Type	**Weekday (Mon-Thu)**	**Friday**	**Saturday**	**Sunday**
Daily Trips	12,130	14,500	18,410	21,970
PM Peak Hour	760 (4:45-5:45 PM)	810 (5:00-6:00 PM)	950 (2:30-3:30 PM)	1,450 (2:00-3:00 PM)
Casino-Resort Peak Hour	760 (4:45-5:45 PM)	1,330 (8:45-9:45 PM)	1,330 (9:15-10:15 PM)	1,450 (2:00-3:00 PM)

Note: Estimates obtained using Streetlight Data; the hour during which the peak volume occurred is shown in parentheses

A2-18 (Cont.)

It is noted that the current casino-resort generates relatively low traffic volumes during the a.m. peak period (7:00 to 9:00 a.m.). Accordingly, the analysis of weekday a.m. peak hour traffic impacts provided in the TIS was not reviewed in detail since the potential for the project to affect operations during this period is minimal. In contrast, the casino-resort generates high volumes of traffic during the weekend midday periods when background traffic levels in this area of Rohnert Park are also high, but the TIS did not analyze this time period. Accordingly, there is a reasonable likelihood that the proposed casino-resort expansion would result in effects on traffic operation during the weekend that have not been identified in the TIS.

Trip Generation Estimates Applied in TIS

For the proposed Graton casino-resort expansion, the TIS used trip generation rates that were obtained from another TIS that was prepared for a casino project in Kern County. The Kern County study relied on data collected in 2005 and 2006 at three existing gaming facilities in California. For the additional hotel rooms proposed at the Graton casino-resort, the TIS uses rates published by the San Diego Association of Governments (SANDAG) for casino hotels. It is noted that while the trip generation table presented in the TIS indicates 87,078 square feet of casino expansion, the trip generation numbers reflect an expansion size of 86,078. As a result, the TIS appears to slightly underestimate trips, though the differences are likely to be inconsequential in terms of influences on potentially adverse effects on traffic operation. A2-19

W-Trans performed an independent analysis of the proposed project's trip generation using rates developed from the 2019 "big data" obtained specifically from the Graton casino-resort to determine the appropriateness of the trip generation estimates applied in the TIS. It was determined that the TIS estimates of weekday and p.m. peak hour trip generation are reasonable and supported by the existing Graton casino-resort's traffic generation characteristics. The a.m. peak hour trip generation estimates applied in the TIS appear to substantially overestimate trip generation, though as noted above, this peak period is not considered to be critical since both the project and background traffic volumes are relatively low. Also as previously noted, the TIS does not assess weekend peak hour trip generation or traffic operation though both background and project-generated traffic levels are high during these periods. A2-20

A summary of the proposed casino-resort's anticipated trip generation is shown in Table 2. The trip generation estimates for weekdays were obtained from the TIS. Saturday and Sunday daily and peak hour trip generation estimates were developed by W-Trans based on the existing casino-resort's trip generation characteristics. As shown in the table, the proposed casino-resort is expected to add more trips on weekend days than were analyzed in the TIS for weekdays. This is particularly evident during the Sunday midday afternoon peak hour, during which the project is anticipated to add over 1,000 trips, in contrast to the 628 trips analyzed in the TIS during the weekday p.m. peak hour. A2-21

Table 2 – Estimated Casino-Resort Expansion Trip Generation			
Analysis Period	**Weekday**	**Saturday**	**Sunday**
Daily Trips	9,117	13,586	15,508
PM Peak Hour	628	706	1,022

Note: Weekday values reflect those presented in the TIS; Saturday and Sunday values reflect estimates developed by W-Trans based on existing casino-resort trip generation characteristics; the weekday p.m. peak hour occurs during the 4:00 to 6:00 p.m. commute; weekend peak hours reflect the highest 60 minutes between 2:00 and 3:30 p.m.

A2-21 (Cont.)

Because the proposed expansion would generate substantial traffic increases during periods on weekend afternoons when background traffic volumes are also high in this area of Rohnert Park, it appears that the TIS did not capture the project's worst-case effects on LOS.

The TIS also assesses traffic occurring prior to events held in the proposed project's 3,500-seat theater. While the TIS states that event trip generation forecasts and volume graphics are included in the technical appendix, this information was not supplied. As a result, it is not possible to verify the event-related trip generation, though review of the Level of Service (LOS) calculation sheets indicates that event trips are being added in the "plus theatre" scenarios. A2-22

Trip Distribution

The TIS provides no information on how the project's added trips were assigned to the surrounding and regional street network. In order to determine the applied trip distribution, W-Trans manually tabulated distribution estimates using the project turning movement exhibit shown in Figure 5 of the TIS. The resulting trip distribution estimates are shown below in Table 3.

Table 3 – Trip Distribution Applied in TIS	
Origin/Destination	**Trip Distribution**
US 101 north of Golf Course Dr	28.6%
US 101 south of Golf Course Dr	22.6%
Rohnert Park Expy east of Redwood Dr	
via Redwood Dr	10.4%
via Labath Ave	10.9%
Stony Point Rd north of Wilfred Ave	9.1%
Golf Course Dr east of Commerce Blvd	9.1%
Redwood Dr south of Rohnert Park Expy	
via Redwood Dr	1.6%
via Labath Ave	2.4%
Stony Point Rd south of Wilfred Ave	3.1%
Redwood Dr north of Golf Course Dr W	1.2%
Labath Ave north of Golf Course Dr W	1.0%
Total	**100.0%**

A2-23

There is considerable uncertainty in the trip distribution assumptions related to the 21.3 percent of trips assigned to Rohnert Park Expressway (RPX) east of Redwood Drive. Presumably, much of this traffic would be oriented to US 101 South via the RPX interchange, with a smaller portion oriented to RPX east of the freeway, though the actual split assumed in the TIS is unknown. Regardless, with over 21 percent of the project's trip distribution passing through the RPX interchange, the TIS should have assessed traffic operation at the RPX freeway ramps and potentially RPX/Commerce Boulevard. A2-24

The majority of traffic associated with the project would be expected to be oriented to US 101. The TIS assigns 28.6 percent of trips to US 101 north. Based on select origin-destination analyses conducted by W-Trans using Streetlight Data, this assignment to US 101 North may be somewhat high. The TIS distributes 22.6 percent of trips to US 101 South via the Golf Course Drive interchange; however, as noted above, it is possible that the TIS assigns additional US 101 South traffic via the RPX interchange. If half of the 21.3 percent assigned to RPX east of Redwood is assumed to be oriented to US 101 South, the total distribution to US 101 South would be approximately 33 percent, which is similar to the existing casino-resort's trip distribution. A2-25

The applied 9.1 percent trip distribution to Golf Course Drive east of Commerce Boulevard is likely too high; with trip distribution at this level, the TIS should have analyzed operation at the Roberts Lake Road intersection. Based on W-Trans's familiarity with the circulation system and local land use patterns, however, actual trip distribution to Golf Course Drive east of Commerce Boulevard is likely to be much lower. A2-26

Figure 5 of the TIS shows no project-related traffic making westbound left-turns or northbound right-turns at the Golf Course Drive West/Redwood Drive intersection, but review of the LOS calculation sheets indicates that some traffic is being assigned to these movements. Traffic growth on these movements would be expected since some drivers traveling to and from the casino resort are likely to access the site via existing intersections on Business Park Drive. A2-27

Overall, the applied trip distribution assumptions in the TIS would benefit from refinement. It is likely that project-based trips are moderately underestimated on some turning movements and overestimated at others. The effects of trip distribution are likely most pronounced at the Golf Course Drive interchange including the intersections at Redwood Drive, US 101 South Ramps, Commerce Boulevard, and the US 101 North ramps; the potential exists that actual LOS effects at these locations may be somewhat worse than reflected in the TIS. A2-28

Traffic Volume Forecasting

The TIS presents an analysis of weekday peak hour traffic operation during two future year (cumulative) time horizons. The first is referred to as "Baseline" and includes a ten-percent increase to the traffic volumes collected in 2022. The ten-percent growth is applied as a uniform factor to all intersection turning movements. The second timeframe is referred to as "Cumulative" and reflects a year 2040 condition. A2-29

The TIS indicates that cumulative volumes are based on the Sonoma County Traffic Model and Northwest Specific Plan DEIR, but otherwise includes no details as to the source of volumes or methodology used to estimate growth on individual intersection turning movements. To better understand how traffic growth was applied, W-Trans analyzed the turning movements shown in the TIS exhibits and determined that the 2040 volumes were developed by applying a uniform 18.6 percent growth factor to 2022 traffic volumes. This approach of using a basic uniform growth factor is not optimal for a complex roadway network, particularly in an interchange area where future growth may be substantially greater on certain movements than others. The source of the 18.6 A2-30
percent growth factor is also unclear. Review of the SCTA travel demand model indicates that p.m. peak hour volumes at the Golf Course Drive/Redwood Drive intersection are likely to increase by 23 to 28 percent by 2040 (without the proposed expansion of the casino-resort). Importantly, the SCTA model shows that east-west through movements are projected to encounter dramatic growth while other movements (such as to and from the northern leg of Redwood Drive) are projected to have much lower growth levels. A2-31

Based on this assessment, it appears that the cumulative traffic growth assumed in the TIS may be underestimated. A potentially greater concern is that the use of a uniform growth factor rather than growth determined on a movement-by-movement level is likely to produce unreliable LOS results. This is particularly concerning at the Golf Course Drive interchange where future volume growth will not occur uniformly. A2-32

Operational Analysis

The existing conditions LOS calculations reflected in the TIS appear to be based on reasonable assumptions at unsignalized intersections and isolated signalized intersections that are not part of coordinated signal networks. Several of the LOS results reported for the signalized intersections within and near the Golf Course Drive freeway interchange, as well as the intersection of Rohnert Park Expressway/Redwood Drive, were better than expected based on W-Trans's familiarity so were further investigated. A2-33

Based on review of the LOS calculations, W-Trans determined that all signalized intersections were assumed in the TIS to operate independently with actuated rather than coordinated timing. It also appears that cycle lengths were optimized for each LOS analysis scenario. Importantly, the signal timing does not appear to account for minimum green times needed for pedestrian crossings, and in many cases the optimized cycle lengths were substantially lower than those actually occurring in the field. For example, the TIS uses optimized p.m. peak hour cycle lengths on Golf Course Drive at the Redwood Drive, US 101 South Ramps, and Commerce Boulevard intersections ranging between 67 and 85 seconds versus the 130-second cycle lengths that currently exist. At the Rohnert Park Expressway/Redwood Drive intersection, for the TIS an existing p.m. peak hour cycle length of 93 seconds was assumed rather than the approximately 146-second actual cycle length. A2-34

These signal timing assumptions would have substantial effects on the average vehicle delays and LOS levels reflected in the calculations and reported in the TIS summary tables. In nearly all cases the applied shorter cycle lengths with optimized timing produce shorter delays and better LOS than is actually occurring in the field. W-Trans estimates that under existing p.m. peak hour conditions, some if not all of the intersections near the Golf Course Drive interchange and at Rohnert Park Expressway/Redwood Drive are likely operating one service level below the results shown in the TIS. A2-35

The signalized intersections at and within the Golf Course Drive interchange also heavily influence one another because of their close spacing. The LOS results produced in the TIS provide an incomplete picture of these influences because of the applied signal timing assumptions. The TIS also does not include any queuing analyses or assessments of how the complex signal system functions as a whole. This information becomes particularly important when analyzing cumulative conditions, and in determining infrastructure modifications that may be necessary to accommodate future traffic including that generated by the proposed casino-resort expansion. A2-36

Identification of Potential Roadway Improvements

Effectiveness of LOS Analysis in Determining Improvements

Many aspects of the LOS analysis contained in the TIS appear to be based on sound assumptions and appropriate methodologies. As described above, however, the basic growth factor approach used to determine cumulative traffic volumes as well as the signal timing assumptions used at key intersections have a substantial influence on the analysis leading to overly optimistic results. Further, the TIS did not include analysis of weekend afternoon peak hours which are expected to constitute the periods when the project would have the greatest effects on LOS. Combined, these effects render the LOS analysis contained in the TIS to be of limited use in determining the infrastructure modifications needed to support the project and background growth, particularly for the Golf Couse Drive interchange area. A2-37

Roadway Improvements Identified in the TIS

The TIS contains two "mitigation" measures to address intersection operations (note that as traffic operation is not a CEQA issue, mitigation is not technically the appropriate terminology). The first (MM 2a) entails widening Golf Course Drive West to accommodate dual westbound left-turns onto Labath Avenue and the project site. This particular measure is not overly influenced by the growth factor and signal timing concerns identified above, and based on review of the projected project-added volumes, appears to be an appropriate roadway improvement. A2-38

The second mitigation measure (MM 2b) entails minor roadway striping, updating the southbound US 101 off-ramp approach at Golf Course Drive to remark the center lane as a left-turn/through-right-turn lane (instead of the current left-turn/through lane). Given the limitations of the LOS analysis and likely lane utilization patterns, it is unclear whether this recommendation should be maintained. W-Trans believes that a superior option in terms of traffic operation would be to add a second dedicated right-turn lane through minor widening and/or potential use of the wide shoulder and sidewalk that appear to have been constructed to accommodate a future transit stop that is not anticipated to ever be used. A2-39

Potential Additional Improvements

It is understood that both the City and Graton Rancheria have an interest in ensuring that residents, employees, and visitors have adequate transportation facilities in place in both the near-term and future. Based on our experience in Rohnert Park and understanding of current and potential future constraints, W-Trans has developed the following list of potential roadway improvements that would provide additional traffic capacity to serve all users, including those generated by the proposed casino-resort expansion. These potential improvements reflect the opinions of W-Trans based on our understanding of the area and are not the result of new LOS analysis performed for the proposed casino-resort expansion. A2-40

Potential Improvement 1: Construct Dowdell Avenue Extension

A2-41

- Extend Dowdell Avenue between Golf Course Drive West and Business Park Drive to better distribute the area's traffic and relieve pressure at the critical Golf Course Drive West/Redwood Drive intersection.
- Complete widening and upgrades at the Golf Couse Drive West/Dowdell Avenue intersection as part of the extension project.
    - Widen westbound Golf Course Drive through the intersection so left-turn pockets can be established in both the eastbound and westbound directions (see Plate 1 for overall concept).

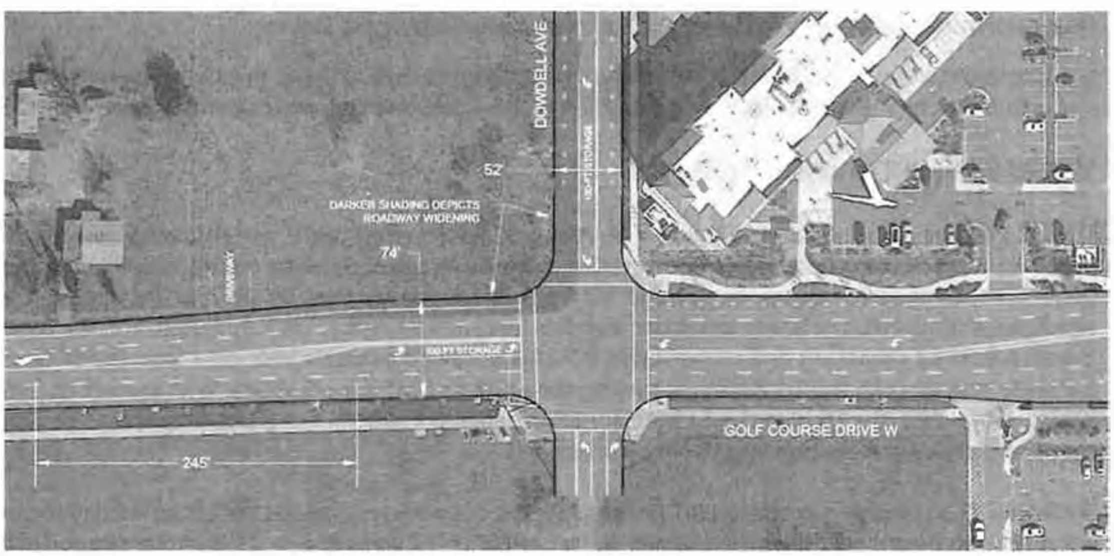


Plate 1 Conceptual widening of Golf Couse Drive West/Dowdell Avenue (exhibit obtained from a prior assessment completed by W-Trans for the City of Rohnert Park)

- Consider signalizing the intersection of Business Park/Dowdell Avenue.
- Include multi-use path along Dowdell Avenue as called for in the Northwest Specific Plan.

Potential Improvement 2: Golf Course Drive West/Redwood Drive Intersection

A2-42

- Restripe the existing eastbound right-turn lane on Golf Course Drive West to a through/right-turn lane in order to improve lane utilization.

- Currently all eastbound traffic headed to 101 North or South tends to use the single outer through lane; by restriping, the outer lane could carry traffic destined to US 101 South while the remaining two lanes would accommodate traffic destined to US 101 North and Golf Course Drive east of Commerce Boulevard. A2-42 (Cont.)
- Reposition the bike lane to curbside, adding green bike lane markings.
- Construct a westbound right-turn pocket (about 100-feet long) along gas station frontage.
- Relocate signal equipment and update signal timing as needed.

Potential Improvement 3: US 101 South Off-Ramp Intersection

- Add a second southbound right-turn pocket on the US 101 South off-ramp. There is potential to complete the widening for the second right-turn lane in the area currently occupied by an unused bus pad and sidewalk (not anticipated to be used at any time in the future). A2-43
- Relocate signal equipment and update signal timing as needed.

Potential Improvement 4: US 101 North Off-Ramp Intersection

- Increase left-turn storage on the off-ramp to reduce potential for spillback onto the mainline freeway. A2-44

Potential Improvement 5: Routine Monitoring and Adjustments to Signal Systems

- Conduct comprehensive review of Golf Course Drive and Rohnert Park Expressway signal systems on a routine basis (for instance, annually or biannually) to ensure that the systems are performing optimally and in response to changes in traffic volumes. A2-45
- Upgrade signal timing capabilities as needed to accommodate special event traffic.
- Casino-Resort should be required to fund manual traffic control by the City's Public Safety Department during special events as needed.

Potential Improvement 6: Rohnert Park Expressway/Redwood Drive

- Increase storage in the southbound left-turn pockets on Redwood Drive; this may require a combination of restriping, channelization (including extension of the raised median), and potentially roadway widening. A2-46

Vehicle Miles Traveled Analysis

The TIS provides an analysis of the potential Vehicle Miles Traveled (VMT) per employee associated with the proposed project, using baseline values available in the SCTA travel demand model. The TIS indicates that the project would need to reduce its average VMT per employee by over 50 percent to meet the applicable significance threshold. The study concludes that this level of VMT reduction is infeasible and the resulting VMT impact would be significant and unavoidable. W-Trans reviewed available VMT data from the SCTA model and generally concurs with the TIS finding regarding the project's VMT per employee. With respect to mitigation of VMT per employee, the TIS notes that a transportation demand management (TDM) plan should be prepared. No specific measures or reduction targets are identified. A2-47

While the TIS analyzes the project's VMT per employee, it does not analyze the VMT associated with guest travel. Because guest travel constitutes the majority of the project's trips, and because a substantial portion of these trips is associated with visitors from the broader region rather than local patrons from Rohnert Park, a visitor-focused VMT analysis should have been included in the TIS to be compliant with CEQA and State requirements. Based on a review of trip length data for the existing casino-resort site as obtained from Streetlight Data, the site's current average trip lengths are approximately 24.6 miles on weekdays and 32.7 miles on weekdays. These average trip lengths are quite high and demonstrate the regional draw (and substantial VMT generation) associated with visitor travel. A2-48

While the VMT analysis contained in the TIS is brief and excludes analysis of visitor travel, its conclusion that the project would result in significant and unavoidable VMT impacts is valid. As required by CEQA, the project should be required to reduce these VMT impacts (for employees as well as guests) to the degree feasible. A2-49

Potential VMT Reduction Strategies

Following are several potential VMT reduction strategies identified by W-Trans that could reduce not only the proposed project's VMT impacts, but also the project's effects on traffic operation. A2-50

- Operate shuttle to Rohnert Park SMART Station and bus hub on Commerce Boulevard.
  - Provide regularly-scheduled daily shuttles coinciding with major shift change periods at the casino-resort to make it more convenient for employees to commute via transit.
  - Operate visitor shuttles timed to meet SMART train arrivals (for example on weekday afternoons and evenings, and for all trains on weekends).
- Subsidize employee transit passes (i.e., pay all or a portion of the cost of monthly Sonoma County Transit and SMART passes for employees).
- Provide incentives for visitors who show proof of traveling by transit (i.e., free meal or gambling credits).
- Operate vanpools for employees, providing service to all areas of the region where concentrations of employees live.
- Increase regional bus service over current levels and add new markets to transport visitors via buses.
- Construct offsite pedestrian and bicycle facilities:
  - Dowdell Avenue multi-use pathway; and
  - Path connection to planned SMART multi-use path near eastern terminus of Millbrae Avenue;
  - Laguna de Santa Rosa path along Hinebaugh Creek between Redwood Drive and tribal land to the west, including extension northward from the creek along the western city limits to the casino-resort.
- Contribute funds toward US 101 pedestrian-bicycle overcrossing at Copeland Creek.
- Implement paid visitor parking.

Non-Auto Mode Impacts

The TIS concludes that the proposed casino-resort expansion would not adversely affect non-auto modes including transit users, bicyclists, and pedestrians. W-Trans generally concurs that CEQA-related impacts to these users are unlikely to occur, though emphasizes that improvements to these modes will play an important role in reducing VMT and traffic impacts. As noted above, such improvements may include added shuttles, vanpools, transit subsidies, and new multi-use pathways. A2-51

Focused Operational Analysis of Post-Event Traffic Operation

W-Trans completed a focused assessment of traffic operation for post-event conditions on a Friday evening. Future peak hour projections were estimated based on prior W-Trans analyses performed in recent years rather than those presented in the TIS. Background "without project" peak hour traffic volumes were adjusted to reflect a Friday evening peak condition using available 24-hour counts. Friday evening traffic associated with the casino-resort expansion, including drivers leaving the resort after an event in the proposed 3,500 seat concert venue was then added to the background Friday evening future traffic volume estimates. Following is a summary of key findings. A2-52

- The following infrastructure improvements (also identified above) are needed to maintain traffic flow on the Golf Course Drive corridor and through the US 101 interchange:
  - Modify the eastbound lane configuration on Golf Course Drive at Redwood Drive to include a left-turn lane, two through lanes, and one through/right-turn lane.
  - Add a second right-turn lane on the southbound US 101 off-ramp.
- With these modifications and with the signal system operating at peak efficiency in response to event demand flows, traffic flow can be maintained within the LOS D range through the interchange area.

- The intersection at Business Park Drive/Dowdell Avenue will require manual traffic control during events until a signal is installed in the future.
- Manual traffic control should be implemented at the Golf Course Drive West/Labath Avenue intersection (the main casino-resort entrance) during events; it is recommended that additional traffic control officers be available during events to quickly respond to issues that may arise during event traffic surges.
- It will be critical for the City to routinely monitor the traffic signal system to ensure that it is adequately responding to event traffic surges; it may be appropriate for the system to be actively monitored during event periods.
- The intersection at Rohnert Park Expressway/Redwood Drive would likely operate at a very low LOS D during post-event periods; as during other peak hours, provision of additional storage in the southbound left-turn pockets would be beneficial given the very high southbound left-turn volumes.

A2-52 (Cont.)

Proportional Share of Infrastructure Improvements

The proposed casino-resort expansion would substantially increase traffic volumes in the northwest quadrant of Rohnert Park. Additional future traffic growth will also be associated with other development projects in the area. The proportional share of future traffic growth that would be attributable to the proposed casino-resort expansion was determined for the intersections identified above as requiring future infrastructure improvements. Background volume growth was obtained from the current SCTA travel demand model, which does not assume any changes or traffic growth on the Graton casino-resort site. The model's growth increment was interpolated to reflect added volumes during the weekday p.m. peak hour between 2022 and the model's 2040 horizon year. The p.m. peak hour trips projected to be added to each intersection by the casino-resort expansion were obtained from the TIS. A summary of the findings is shown in Table 4.

A2-53

Table 4 – Graton Expansion Proportional Share of PM Peak Hour Traffic Volume Growth

Intersection	Background Growth[1]	Graton Added Volumes	Total Volume Growth	Graton Share of Growth
Golf Course Dr W/Dowdell Ave	593	359	952	38%
Golf Course Dr W/Redwood Dr	515	391	906	43%
Golf Course Dr/US 101 S Ramps	578	384	962	40%
Commerce Blvd/US 101 N Ramps	351	172	523	33%
Rohnert Park Expy/Redwood Dr	385	156	541	29%

Note: [1] Interpolated 2022-2040 p.m. peak hour traffic volume growth obtained from SCTA model (SCTM19 – rev. 12/21)

Conclusions

- The existing Graton Casino Resort generates between 12,000 and 22,000 daily vehicle trips and up to 1,450 vehicle trips per hour during peaks, with the highest trip levels occurring on weekends. A2-54
- The TIS estimates of weekday and p.m. peak hour trip generation are reasonable, but no weekend trip generation information is provided. The TIS includes no trip generation information for the proposed 3,500-seat theater, though LOS calculation sheets indicate that event trips are being added in theatre scenarios. A2-55
- Based on the current casino-resort's trip generation characteristics, W-Trans estimates that the proposed expansion will generate more peak hour traffic on weekend afternoons than during the weekday p.m. peak hour analyzed in the TIS, particularly on Sundays. A2-56
- The TIS does not assess weekend afternoon peak hour trip generation or traffic operation; because the proposed expansion would generate substantial traffic increases on weekend afternoons when background A2-57

traffic volumes are also high in this area of Rohnert Park, it appears that the TIS did not capture the project's worst-case effects on LOS. A2-57 (Cont.)

- The TIS's distribution of added vehicle trips would benefit from refinement as some origin/destination locations appear to be five to ten percent too high or low; the effects of trip distribution on LOS would likely be most pronounced at the Golf Course Drive interchange area intersections where actual LOS effects could be somewhat worse than reported. A2-58

- Approximately 21.3 percent of trips were assigned to RPX east of Redwood Drive for the operational analysis. It is unclear what portion of these trips are oriented to US 101 South versus RPX to the east of the freeway. In either case, additional intersections at the RPX interchange and potentially Commerce Boulevard should have been analyzed given the number of trips being assigned to this area. A2-59

- The background traffic forecasts used in the TIS are based on a flat growth rate of 18.6 percent applied to all turning movements. Output from the SCTA model indicates that average 2040 growth should be higher (in the range of 23 to 28 percent), and that traffic growth would vary dramatically by turning movement. A2-60

- The methodologies used in the TIS to analyze unsignalized intersections and isolated signals appear to be reasonable, but unrealistic timing assumptions are used at the Golf Course Drive interchange-area signals and at the Rohnert Park Expressway/Redwood Drive study intersection. It is estimated that actual LOS results at these locations may be up to a full service level lower than reported. A2-61

- The combined effects of the applied traffic forecasting methodology, unrealistic signal timing assumptions at interchange-area intersections, and lack of analysis during weekend afternoon peak periods render the LOS analysis contained in the TIS to be of limited use in determining appropriate traffic improvement measures. A2-62

- The TIS conclusion of a significant and unavoidable impact related to the project's VMT per employee is appropriate. The TIS should also have included an analysis of the VMT associated with guests; it is likely that a significant and unavoidable VMT impact would also be associated with visitor-based travel. The existing casino-resort has notable average trip lengths of 24.6 miles on weekdays and 32.7 miles on weekends. A2-63

- The TIS indicates that a TDM plan would be required to mitigate VMT impacts though provides no specific measures that could be implemented. A2-64

- During post-event conditions on Friday evenings, it appears that traffic flow can generally be maintained within the LOS D range as long the signal system is operating at peak efficiency in response to event demand flows, and the intersection improvements recommended below at Golf Course Drive West/Redwood Drive and Golf Course Drive/US 101 South Ramps are implemented. A2-65

- The proposed casino-resort expansion is estimated to be responsible for 29 to 43 percent of the future traffic growth occurring at intersections in need of future infrastructure improvements. A2-66

Recommendations

- The City should work with the Graton Rancheria to implement physical infrastructure improvements aimed at maintaining traffic flow in areas where the casino-resort expansion would generate added traffic. A2-67

- The following roadway improvements would be expected to help offset the project's adverse effects on traffic operation; the Tribe should strive to complete as many of these improvements as feasible (the City may wish to make edits to add or delete projects from this list): A2-68
  - Golf Course Drive West/Redwood Drive Intersection
    - Restripe the eastbound right-turn lane to a through/right-turn lane.
    - Reposition the bike lane to curbside, adding green bike lane markings.

    - Construct a westbound right-turn pocket along a portion of the gas station frontage.
  - US 101 South Off-Ramp Intersection
    - Add a second southbound right-turn lane.
  - US 101 North Off-Ramp Intersection
    - Increase left-turn storage on the off-ramp.
  - Rohnert Park Expressway/Redwood Drive
    - Increase storage in the southbound left-turn pockets on Redwood Drive.
  - Monitor and Adjust Signal Systems on Golf Course Drive and Rohnert Park Expressway
    - Routinely review and update signal systems (annually or biannually).
    - Upgrade signal timing capabilities as needed to accommodate special event traffic.

A2-68 (Cont.)

- The following TDM measures would be expected to help offset the project's VMT impacts and would also help reduce adverse effects on traffic operation; the Tribe should strive to implement as many of these measures (or others as determined by the City) as feasible:
  - Operate employee and visitor shuttles to Rohnert Park SMART Station and bus hub on Commerce Boulevard.
  - Subsidize employee transit passes.
  - Provide incentives for visitors who show proof of traveling by transit.
  - Operate vanpools for employees.
  - Increase regional bus service over current levels and add new markets to transport visitors via buses.
  - Construct offsite pedestrian and bicycle facilities:
    - Dowdell Avenue multi-use pathway
    - Path connection to SMART multi-use path near Millbrae Avenue
    - Path along Hinebaugh Creek west of Redwood Drive with extension along western City limits to casino-resort
  - Contribute funds toward US 101 pedestrian-bicycle overcrossing at Copeland Creek.
  - Implement paid visitor parking.

A2-69

- The following measures should be implemented to accommodate surges in event traffic generated by the proposed 3,500 seat concert venue:
  - Provide manual traffic control at the Golf Course Drive West/Labath Avenue intersection.
  - Provide manual traffic control at the Business Park Drive/Dowdell Avenue intersection until a signal is installed in the future.
  - Ensure that additional traffic control officers are available to quickly respond to traffic issues that may arise during event traffic surges.
  - Consider having City personnel actively monitor traffic signal systems during events.

A2-70

Thank you for giving W-Trans the opportunity to provide these services. We look forward to continued work with the City of Rohnert Park.

Sincerely,

Zachary Matley

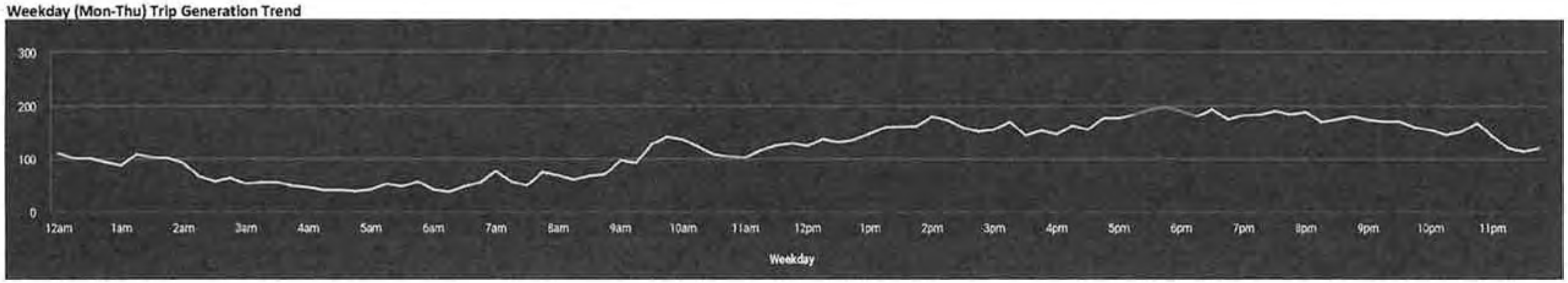
Zachary Matley, AICP
Principal

JZM/RPA911-19.L1

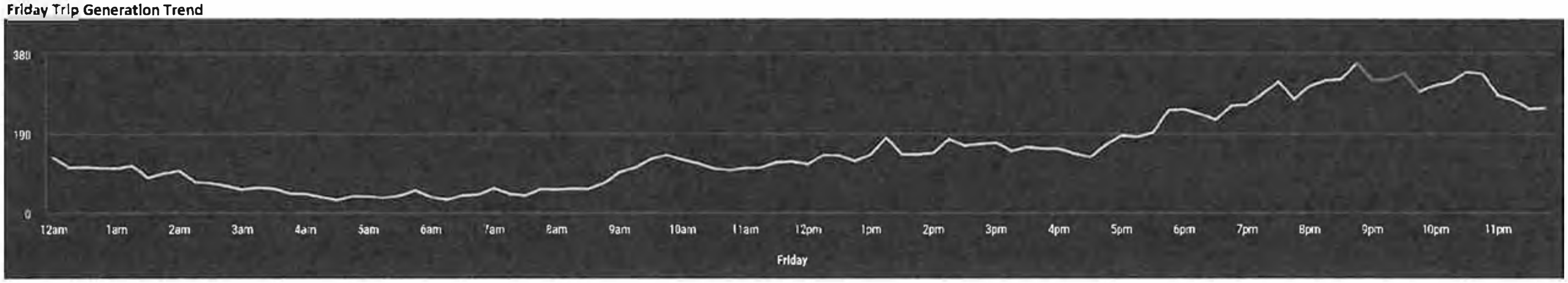
Enclosure: Charts depicting existing casino-resort's hourly trip generation patterns by day of week

2019 Graton Casino Resort Trip Generation Trends

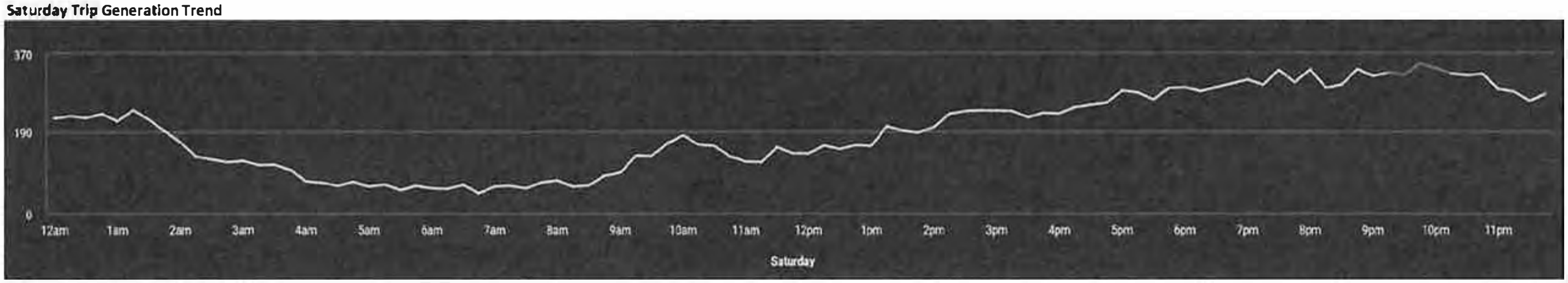
Weekday (Mon-Thu) Trip Generation Trend



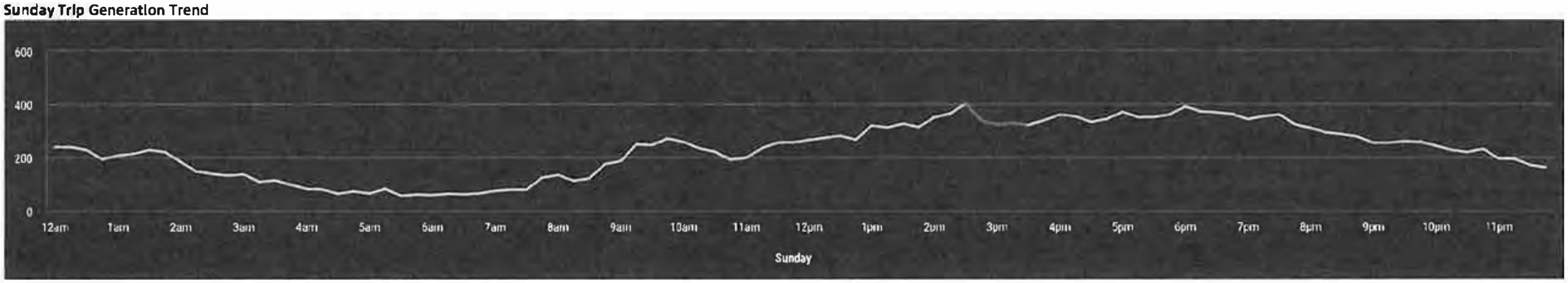
Friday Trip Generation Trend



Saturday Trip Generation Trend



Sunday Trip Generation Trend



SANTA ROSA PLAIN
GROUNDWATER
SUSTAINABILITY AGENCY

January 31, 2023

Federated Indians of Graton Rancheria
Attn: NOP Comments
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: Comments on Graton Resort & Casino Expansion Project Draft Tribal Environmental Impact Report

This letter presents comments on behalf of the members of the Santa Rosa Plain Groundwater Sustainability Agency (GSA). We appreciate the opportunity to comment on the draft Tribal Environmental Impact Report (TEIR) for the Graton Resort & Casino Expansion Project (Project) released December 2022. A3-01

The draft TEIR identifies potential impacts to groundwater conditions within the Santa Rosa Plain Subbasin associated with the projected increase in water demands from an existing average of 205 acre-feet per year (AFY) to a projected average of approximately 377 AFY. Should the water demands associated with the project be met using groundwater supplies, the potential impacts identified within the TEIR include causing "a net deficit in aquifer volume or a lowering of the groundwater level" and "[a]n increased radius of influence would be expected and potentially have a negative effect on nearby wells in the immediate vicinity of the Resort." A3-02

The Santa Rosa Plain Groundwater Sustainability Agency (GSA) encourages the Federated Indians of Graton Rancheria (Tribe) to pursue the mitigation measure recommended in the TEIR of purchasing recycled water from the City of Rohnert Park to offset the need to pump groundwater from the Subbasin, or recycling water onsite, to the fullest extent feasible. The Tribe should also consider funding projects that reduce groundwater demand and supplement groundwater supplies through recharge enhancement to offset any projected water demands associated with the Project which cannot be met through recycled water deliveries. Applicable projects identified within the GSP and currently being pursued by the GSA include a Water-Use Efficiency (WUE) Assessment and Pilot Program for groundwater users and planning and implementation of Aquifer Storage and Recovery (ASR) projects. A3-03

While the TEIR analyzes species that depend on marshes, wetlands, and swamps, the connection between those water features and habitats and groundwater dependent ecosystems was not discussed. The GSA urges the Tribe to conduct an analysis of potential impacts on groundwater dependent ecosystems and include the information in the Final TEIR, as well as an analysis of whether any of the species in the biological section are considered part of a groundwater-dependent ecosystem, and include mitigation measures to the extent feasible. A3-04

The TEIR discusses the use of low-flow WaterSense fixtures as a Best Management Practice (BMP). The GSA asks that the Tribe consider installation of low-flow fixtures and any other applicable and feasible water use reduction technology as mitigation measures rather than BMPs, so that they are required. It would also be helpful if the mitigation measure for reclaimed water would indicate how much reclaimed water the Tribe may purchase or produce, to show that the mitigation measure will concretely mitigate the potentially negative impacts on the aquifer from increased extractions. These revisions would better support a finding that the impact on groundwater is less-than-significant. A3-05

The GSA and the Tribe have worked together on local groundwater management for years. For example, the Tribe has a seat on the GSA's Advisory Committee and the GSA consults with the Tribe on any potential tribal cultural resources issues related to GSA projects. The GSA appreciates this collaborative relationship and hopes that the Tribe will continue to engage in development that includes water resource planning and uses that benefit both the Tribe and the local community. This approach would be in keeping with the Tribe's work on the GSA and our mutual goal of sustainable management of this shared and precious resource. A3-06

The GSA also requests the Tribe to analyze whether groundwater use by the Project will affect any groundwater dependent ecosystems and consider ways to reduce groundwater use to mitigate those potential impacts to the extent feasible. A3-07

The GSA requests that the Federated Indians of Graton Rancheria consider the above comments, questions, and recommendations. If you have any questions or concerns about the GSA's input, or would like to meet to discuss, please contact me at (707) 243-8555 or arodgers@santarosaplaingroundwater.org.

Respectfully,

Andy Rodgers, Administrator
Santa Rosa Plain Groundwater Sustainability Agency

APPENDIX J

RESPONSES TO COMMENTS ON THE DRAFT TEIR

APPENDIX J

RESPONSES TO COMMENTS ON THE DRAFT TEIR

1.0 INTRODUCTION

A Notice of Availability for the Draft Tribal Environmental Impact Report (Draft TEIR) prepared for the Graton Resort & Casino Expansion Project (Proposed Project) was published in the *Press Democrat* on December 19, 2022, and the Draft TEIR was also submitted to the State Clearinghouse on this day. The Draft TEIR was circulated to the Office of the Attorney General, California Gambling Control Commission, Sonoma County, and City of Rohnert Park, and was made available for review online at gratonteir.com, as required by the Tribal-State Compact (Compact). This initiated a 45-day public comment period, during which time written comments regarding the Draft TEIR were accepted through February 1, 2023. An extension of the public comment period was granted through February 8, 2023 upon the request of Sonoma County.

Three comment letters were received regarding the Draft TEIR. An index of commenters is provided in **Table 1** and copies of the comment letters are provided in **Appendix I**. Responses to each relevant comment received are provided on the following pages. Revisions have been made to the Final TEIR as warranted.

TABLE 1
INDEX OF COMMENTERS

LETTER #	DATE RECEIVED	COMMENTER
A1	February 8, 2023	Sonoma County Administrator's Office and Sonoma County Water Agency; Marissa Montenegro
A2	February 1, 2023	City of Rohnert Park; Mary Grace Pawson
A3	January 31, 2023	Santa Rosa Plain Groundwater Sustainability Agency; Andy Rodgers

2.0 LETTER A1: SONOMA COUNTY ADMINISTRATOR'S OFFICE AND SONOMA COUNTY WATER AGENCY

A1-01

The commenter expresses they are in receipt of the Draft TEIR for the Graton Resort & Casino Expansion Project. Further, the commenter explains that different staff have reviewed and provided comments in the following areas: Aesthetics, Air Quality, Biological Resources, Geology and Soils, Greenhouse Gas Emissions, Water Resources, Housing, Public Services, and Transportation and Traffic. Commenter expresses their interest in working with the Tribe to address the concerns raised.

Comment noted.

A1-02

The commenter explains that the comment letter provides comments on the Draft TEIR and acknowledges that the lead agency is the Federated Indians of Graton Rancheria (Tribe). Further, gratitude is extended from the County of Sonoma and Sonoma County Water Agency for the opportunity to provide comments.

Comment noted.

A1-03

The commenter discusses that the Proposed Project will be constructed in a developed footprint of the existing facility, which would avoid new conversion of wetland or upland habitat to developed uses. The commenter notes that the project proposes a substantial addition to the existing facility, which could result in substantial impacts due to the near doubling of the gaming and hotel capacity as well as the addition of new facilities. The commenter also provides a table showcasing the breakdown of the existing facility, expansion, and total facility size.

The numbers provided in the commenter's table, which showcase facility size, are largely similar to the anticipated square footage of the Proposed Project but do not accurately reflect all numbers provided in the Draft TEIR. Anticipated facility size can be found in Table 3-1 of the Draft TEIR. While the commenter correctly notes that the Proposed Project would be constructed in an existing developed footprint, no wetland or upland habitats would be converted. Although the TEIR is only required to address impacts to off-reservation sensitive habitats, construction would be limited to existing paved areas and two stormwater detention basins, which would be removed to accommodate the expansion.

A1-04

The commenter notes that it is unclear if the spa or pool will be modified in its existing footprint, if it will be the same size and capacity in a different footprint, or if it will be expanded with a new footprint.

The existing pool and spa will not be modified in its capacity or footprint. However, a new heated swimming pool will be constructed adjacent to the proposed hotel tower south of the existing pool area. The total expansion of the pool and deck area will be 25,000 square feet (sf) and is further discussed in Section 3.0 of the Draft TEIR. Figure 3 of the Draft TEIR also shows the site plans for the expansion.

A1-05

The commenter states that groundwater usage will nearly double in comparison to existing levels and that the original groundwater impact analysis concluded that the existing facility would negatively impact regional groundwater levels. The commenter states that the water demand of the existing Resort plus the Proposed Project will exceed the allowable water usage analyzed in the original analysis and claims that this could consequently have a negative impact on the overall Santa Rosa Plain groundwater basin.

The commenter does not cite the sources of the numbers provided. It is assumed that the commenter is referring to the Final Environmental Impact Statement (Final EIS) prepared in 2009 when referring to the original impact analysis. The Final EIS analyzed the potential for the Resort to result in significant impacts to groundwater levels, considering both the Resort itself as well as the cumulative environment. The Final EIS and subsequent Record of Decision (ROD) found that there would be a less-than-significant regional groundwater impact when considering the Resort by itself as well as the Resort in conjunction with the cumulative environment. Section 5.0 of the 2009 Final EIS provided mitigation related to groundwater impacts in support of the less-than-significant impact determination. As discussed in the Draft TEIR, current groundwater use falls below the amount analyzed in the Final EIS.

Please refer to Section 4.8 of the Draft TEIR for a complete analysis of the impact on water resources. Impact 4.8-2 specifically addresses groundwater impacts and includes mitigation measures to minimize impacts to groundwater. BMPs in Section 3.0 and Mitigation Measure 4.3-1 in the Final TEIR include using energy-efficient appliances and low-flow water fixtures, which would reduce groundwater use by up to 20 percent. As discussed in Impact 4.8-2, the Tribe would implement a recycled water program that may include the construction of an on-site wastewater treatment plant (WWTP), the purchase of recycled water from the City of Rohnert Park, or a combination thereof. Currently, there is no use of recycled water on the project site. Implementation of a recycled water program, as discussed under Impact 4.8-2 and under Mitigation Measure 4.8-2, would allow the Tribe to offset a significant portion of the Proposed Project's groundwater pumping demand and potentially a portion of groundwater pumping for the existing facility. As groundwater use would remain within the Tribe's projected usage determined in the 2009 Final EIS and ROD to be less-than-significant, and because water demand would be significantly offset by the use of recycled water, the Draft TEIR determined that impacts to groundwater resources would be less than significant.

A1-06

The commenter states that greenhouse gas emissions will increase by over 8,000 CO_2 equivalents per year and the Proposed Project would also result in increased traffic, vehicle miles traveled (VMT), and emergency response and law enforcement needs.

The commenter refers to emissions identified within Table 4.6-1 of the TEIR but does not raise specific concerns with the calculation or level of impact. The commenter does not raise specific concerns regarding traffic, VMT, or emergency response plans.

A1-07

The commenter points out that the existing Resort was constructed in 2013 with an addition in 2016 in accordance with stormwater management standards in effect at that time. The commenter claims that if the Resort was constructed presently in Sonoma County it would be subject to the most recent Low Impact Development Manual standards for water quality treatments and detention. Further, the commenter states that if the Proposed Project were located in unincorporated Sonoma County, it should be designed pursuant to the current Phase 1 MS4 Permit and Low Impact Development Manual with an opportunity for review by Permit Sonoma.

Although the Proposed Project is located on trust land and is not required to comply with local stormwater design standards onsite, the Grading and Drainage Plan, included as Appendix D of the Draft TEIR, has been revised to show stormwater runoff calculations utilizing the City of Santa Rosa's Stormwater Calculator. Revised calculations demonstrate that the Proposed Project is consistent with the current Low Impact Development requirements of the North Coast Regional Water Quality Control Board (NCRWQCB) for both the City of Santa Rosa and Sonoma County. Additionally, the current Phase 1 MS4 permit requires compliance with the City of Santa Rosa and County of Sonoma's LID Technical Design Manual. Appendix D of the Draft TEIR has been revised to demonstrate compliance with the City of Santa Rosa and County of Sonoma's LID Technical Design Manual. As the revised calculations in Appendix D of the Draft TEIR confirmed compliance with Low Impact Development standards, further revisions to the Draft TEIR are not warranted. The Tribe will continue to consider Low Impact Development standards as site plans are finalized.

A1-08

The commenter discusses the County's review of the Draft TEIR. They also note that for some comments, more information may be needed for the commenter to fully comment on the impacts of the Proposed Project.

Comment noted.

A1-09

The commenter alleges that the air quality thresholds of significance used in the Draft TEIR are not recognized standards. The comment suggests that the Draft TEIR incorrectly used major stationary source permitting thresholds and should instead utilize criteria air pollutants for land use established by the Bay Area Air Quality Management District (BAAQMD), or comparable thresholds. The comment also notes that it was unclear to county staff whether the Proposed Project's maximum annual or average annual emissions were being reported.

The Proposed Project is located on trust land, and air quality and GHG impact analysis was conducted according to significance criteria within the Tribe's Environmental Impact Analysis Checklist (Appendix A of the Draft TEIR). BAAQMD attainment levels and other state and local regulations are discussed in Section 4.3 of the Draft TEIR and were considered in analysis.

A1-10

The commenter suggests that the Draft TEIR compares construction-related emissions to the BAAQMD annual emissions for project operation. The comment also notes that the BAAQMD construction-related significance thresholds are daily thresholds.

Refer to Response to Comment A1-09. Section 4.3 of the Final TEIR has been revised to discuss daily thresholds, and to note that construction would be phased.

A1-11

The commenter claims that the Air Quality and Greenhouse Gas (GHG) sections of the Draft TEIR did not discuss local plans for air quality or GHG that cover the adjacent off-reservation area. The comment also notes that the County has a Strategic Plan with overarching goals to make Sonoma County carbon neutral by 2030 and that the City of Rohnert Park and other cities in the vicinity have the same goal.

Refer to Responses to Comments A1-09 and A1-10. A discussion of the County's Strategic Goals pertaining to air quality has been added to Sections 4.3 and 4.6 of the Final TEIR. A discussion of the BAAQMD 2017 Clean Air Plan has also been added, and the discussion of the City of Rohnert Park General Plan has been updated to reflect the proposed changes in the 2040 General Plan update. BMPs in Section 3.0 and Mitigation Measure 4.3-1 (added to Section 4.6) of the Final TEIR include measures consistent with county-wide carbon reduction goals.

A1-12

The commenter suggests that the climate regulatory framework in the Draft TEIR is incomplete and fails to mention SB 32, AB 1279, and other legislation pertaining to GHG emission reductions.

A discussion of AB 1279 has been added to Sections 4.3 and 4.6 of the Final TEIR. In addition, an expanded discussion of SB 32 has been added to the Section 4.6 of the Final TEIR.

A1-13

The commenter notes that the Draft TEIR identifies CARB's 2017 AB 32 Scoping Plan rather than CARB's 2022 AB Scoping Plan.

A discussion of CARB’s 2022 Scoping Plan has been added to Sections 4.3 and 4.6 of the Final TEIR.

A1-14

The commenter notes that the Draft TEIR incorrectly identifies CARB's 2017 AB 32 Scoping Plan rather than CARB 2022 Scoping Plan. The comment also alleges that, given the breadth of new measures established in the CARB 2022 Scoping Plan, the Proposed Project would conflict with existing off-reservation plans, policies, or regulations adopted to reduce greenhouse gas emissions. The commenter additionally alleges that the Proposed Project would conflict with the county-wide reduction targets of carbon neutrality by 2030.

Refer to Responses to Comments A1-09 through A1-13. BMPs in Section 3.0 have been revised and Mitigation Measure 4.2-1 has been added to the Final TEIR to address off-reservation air quality impacts.

A1-15

The commenter claims that the Draft TEIR did not evaluate energy use and energy sources per the 2018 CEQA guidelines. The comment also notes that the Proposed Project should have evaluated energy use for all phases and components, including transportation-related energy, during construction and operation. The comment also claims that the Draft TEIR should have made relevant considerations to the size, location, orientation, equipment use, and any renewable energy features that could be incorporated into the Proposed Project.

The Proposed Project is located on trust land and is not required to adhere to CEQA guidelines. Analysis was conducted according to the Tribe’s Environmental Impact Analysis Checklist, which was included as Appendix A of the Draft TEIR. While the Checklist does not require analysis of energy use, energy use was still discussed in Section 4.6 of the Draft TEIR and related BMPs identified in Section 3.0 and Mitigation Measure 4.3-1 of the Final TEIR have been incorporated into project design. Additionally, annual electricity demand, natural gas usage, water consumption, and wastewater and solid waste generation rates were estimated using California Emissions Estimator Model Version 2020.4.0 (CalEEMod) (see Appendix F of the Draft TEIR). CalEEMod was used to estimate the Proposed Project’s operational and construction energy usage by considering the type of project, size, location, orientation, number of vehicles, distance vehicles travel, renewable energy features, and other factors.

A1-16

The commenter alleges that the Draft TEIR did not evaluate climate hazards. The comment also notes that, under CEQA, state and local agencies must (1) evaluate and disclose the significant environmental impacts of locating development in areas susceptible to hazardous conditions and (2) adopt all feasible mitigation measures to reduce or eliminate those impacts. Last, the comment acknowledges that CEQA does not apply to the Draft TEIR but suggests that environmental impacts related to wildfires, flooding, extreme heat, extreme weather, and drought should be evaluated to ensure the Proposed Project is aligned with regional goals.

Refer to Response to Comment A1-15. The scope of the Proposed Project’s analysis was conducted in accordance with the Tribe’s Environmental Impact Analysis Checklist, which was included as Appendix A of the Draft TEIR. Risks associated with wildfires were evaluated in Section 4.7, Hazardous Materials, and risks of flooding were evaluated in Section 4.8, Water Resources. Further, extreme heat, extreme weather, and drought are regional and global phenomena not caused by a single source but rather by the cumulative effect of manufactured and natural sources. As such, the Proposed Project's cumulative effect related to climate change was considered in Section 4.15 of the Draft TEIR, under the cumulative impact analysis.

A1-17 and A1-18

The commenter notes that the 2017 CARB Scoping Plan was referenced instead of the 2022 Scoping Plan. The commenter notes the Scoping Plan target of reducing VMT by 25 percent below 2019 levels by 2040.

The comment also suggests that the Draft TEIR should incorporate mitigation measures to promote mode shifting between the Project Site and the SMART station.

Refer to Responses to Comments A1-09 and A1-13. The existing Resort implements measures to reduce VMT, such as the use of an extensive bus system. Currently, the Resort’s bus system carries patrons to and from the Resort to the Bay Area, including San Francisco, Daly City, San Jose, and Milpitas. Approximately 36 buses run from the Resort to the Bay Area daily. In addition, Sonoma County Transit (SCT) already provides weekday and weekend services to the Resort, and a Traffic Demand Plan would be prepared to parallel the requirements set forth by the Sonoma County Transportation Authority. Mitigation Measure 4.3-1 has been added to the Final TEIR to reduce air quality impacts, and includes incorporating preferential parking for Plug-In Electric Vehicles along with the installation of corresponding electric vehicle charging stations into design of the Proposed Project.

A1-19

The commenter describes the Scoping Plan target of decarbonizing transportation fuels and suggests that the Draft TEIR includes mitigation measures to include expanded EV charging stations, and the Proposed Project should commit to the electrification of fleet vehicles.

Refer to Response to Comment A1-17.

A1-20

The commenter describes the Scoping Plan target of reducing CO_2 emissions from electricity generation and suggests the Draft TEIR incorporate demand response strategies and mitigation measures to install solar collection and backup to support participation in demand response and a commitment to purchase "green" electricity.

As discussed within the Draft TEIR, the Tribe already purchases electricity from Sonoma Clean Power and already utilizes rooftop solar. As a component of the Proposed Project, additional solar may be installed.

A1-21 through 25

The commenter discusses requirements of the Scoping Plan and states that the existing Resort and Proposed Project should comply with these requirements. Additionally, the commenter suggests that the TEIR should include mitigation measures for the highest R-value insulation, Low-E glass, and maximization of passive lighting, heating, and cooling.

Refer to Responses to Comments A1-14, A1-17, A1-19, and A1-20.

A1-26

The commenter states that the Draft TEIR should have explicitly evaluated energy usage to help demonstrate how energy efficiency measures would lower energy consumption.

Refer to Response to Comment A1-15.

A1-27

The commenter alleges that the TEIR should evaluate climate hazards, including the risk of wildfires, flooding, extreme weather, and droughts. The comment also notes that Sonoma County has experienced extreme weather in the past years, and the Proposed Project's design should be updated compared to the design of the existing structures with improved fire hardening and flood management measures.

Refer to Response to Comment A1-16.

A1-28

The commenter notes that the County has a Climate Resilient Lands Strategy Plan with goals and targets, including installing permeable hardscapes, installing greenspaces, and using heat-reducing exterior materials.

Refer to Responses to Comments A1-15 and A1-16. Discussion of the Climate Resilient Lands Strategy Plan has been added to the Section 4.6 of the Draft TEIR.

A1-29

The commenter notes that updating the Draft TEIR to analyze climate change consistent with the above comments would address on- and off-reservation impacts and assist the Tribe in evaluating long-term resilient infrastructure planning.

Refer to Responses to Comments A1-15, A1-16, and A1-28.

A1-30

The commenter states that the language used in the discussion of landscaping and lighting in the body of the TEIR is inconsistent with that discussed in the BMPs.

Section 3.2.1 states "Landscaping will be consistent with the existing landscape design. Consistent with existing facilities, the Proposed Project will use downcast, fully shielded, high-efficiency lamps for exterior lighting, will avoid exterior neon and flashing lights, and will glaze exterior glass to minimize glare and nighttime illumination."

The wording of the BMP is:

- Exterior lighting will be downcast, fully shielded, and high efficiency. Obtrusive light-emitting devices such as neon lights or flashing lights will not be used.

Both of these BMPs from the DTEIR indicate that the project design will not use exterior neon or flashing lights. While the text is not repeated verbatim, the text has the same meaning in both instances.

A1-31

The commenter requests that the Proposed Project be revised to include the possible expansion of the solar array to the rooftop and parking areas.

The existing Resort already has solar panels on the parking garage rooftop and the Proposed Project already includes additional solar panels on the proposed parking garage.

A1-32

The commenter suggests that the Proposed Project should consider providing shuttle service to and from current and/or future nearby SMART train stations.

Refer to Response to Comment A1-17.

A1-33

The commenter suggests that the Proposed Project should consider eliminating all polystyrene takeout containers and require food waste composting for all restaurant or food stall use onsite.

BMPs in Section 3.2.3 of the Draft TEIR already include promoting food waste composting.

A1-34

The commenter suggests that the Proposed Project should consider developing a revised bus schedule to minimize the time that buses may wait idling, requiring buses to turn off engines while parked, or a plan for the use of alternative fuel buses.

Refer to Response to comment A1-17.

A1-35

The commenter notes that the Draft TEIR should be revised to eliminate high water-demand plants from the proposed landscape inventory.

The grading and drainage study, included as Appendix D of the Final TEIR, has been revised to include a list of plants identified by the City of Santa Rosa as approved plants for vegetation of low-impact development features.

A1-36

The commenter requests the addition of protections for bicyclists traveling along Wilfred Avenue between Highway 101 and Stony Point Road, but does not identify concerns with the level of impacts or mitigation presented within the Draft TEIR.

As stated within the Traffic Impact Analysis included as Appendix G of the Final TEIR, alterations to the existing bike paths would not occur as part of the Proposed Project and the Proposed Project would not significantly impact or overcrowd existing bicycle paths.

A1-37

The commenter states that the analysis in Section 4.2 of the Draft TEIR does not use an established methodology for evaluating aesthetic impacts. The commenter further recommends that the County of Sonoma's visual guidelines, or a comparable document, be used.

The Tribal-State Compact Checklist (Appendix A of the Draft TEIR) provides guidance on what constitutes a significant off-reservation impact on aesthetics. Off-reservation regulatory considerations are discussed in Section 4.2.1 of the Draft TEIR. Visual Impact Assessment guidelines sourced from the DOT were used in the methodology for this analysis. Section 4.2 of the Draft TEIR has been revised to include this information. The Sonoma County Visual Assessment Guidelines have been reviewed and Section 4.2.1 has been revised to include a summary. Furthermore, Section 4.2.3 has been revised to include an analysis of the Proposed Project using the Sonoma County guidelines.

A1-38

The commenter asserts that the Draft TEIR should include standard construction air quality mitigation measures, including construction hours and schedules, and keeping fugitive dust onsite.

Refer to Response to Comment A1-15. Section 3.0 of the Draft TEIR states that construction will be limited to weekdays 7 am to 10 pm to the extent feasible.

A1-39

The commenter notes that the Draft TEIR determined air quality impacts are less-than-significant because pollutants were under the federal *de minimis* thresholds. The comment states that the same argument was made to justify a less-than-significant finding for cumulative impacts concerning air quality thresholds. The commenter alleges that using the same argument for individual and cumulative analysis is unacceptable due to "circular reasoning."

Refer to Responses to Comments A1-15 and A1-16.

A1-40

The commenter asserts that survey dates, methods, and results of biological surveys were not summarized within the TEIR or included as appendices and are needed to complete an evaluation of the impact analysis for biological resources. However, the commenter points out that the project will be constructed in an existing development footprint and would not likely impact any new plant communities and listed, rare, or special concern species.

Refer to Response to Comment A1-03. The commenter is correct in stating that development of the Proposed Project would occur within previously developed areas and would not impact off-reservation sensitive habitats, wetlands, or habitat that could support listed species. Therefore, specific survey data is not discussed further.

A1-41 through 45

The commenter discusses the silt fence mitigation measure for the California tiger salamander (CTS). The commenter points out the gaps in the fencing located near the southwest corner and north property line of the Subject Property. Additionally, it is proposed that secondary wattle and silt fences be deployed in the interior of the site around new facility construction areas. The commenter urges that BMPs be employed to create a secondary silt fence perimeter and wattle lines around interior wetlands to protect interior and adjacent water resources from redundant sediment and stormwater.

The commenter also discusses that the SWPPP should clearly showcase how water runoff from construction is directed away from existing wetlands and other aquatic habitats.

Implementation of Mitigation Measure 4.4-1 includes the installation of silt fencing for the protection of both CTS and off-reservation wetlands. The gap located near the southwest corner of the property is a gravel access roadway, and the northern border of the Project Site is the Resort frontage and access drives. Additionally, the perimeter of the Resort parking lot has a sidewalk curb and gutter that the proposed silt fencing would be installed behind. The curb and gutter continues along areas that do not include the proposed silt fence. Therefore, silt fencing (and secondary straw wattles) is redundant because the existing curb and gutter already prevents CTS from accessing the Resort parking lot and runoff is already appropriately captured and disposed of. Lastly, the existing Resort is highly disturbed with traffic and patrons, and construction of the Proposed Project would not constitute new disturbance.

Drainage BMPs, including placement of straw wattles, are discussed in Section 3.2.3 of the Draft TEIR. A SWPPP per EPA standards would be implemented for the protection of surface waters during construction (Impact 4.4-2, Impact 4.4-3 in the Draft TEIR). The SWPPP will include a BMP figure showing the locations of stormwater BMPs such as wattles. Additionally, it is noted that the project would be constructed in phases, beginning with the parking garage. Phased development would reduce the amount of construction-related runoff at any given time.

A1-46

The commenter discusses the timeline for the performance of nesting bird surveys. Nesting bird surveys should be performed no earlier than 5 days (not 14 days) before construction is initiated. These nesting surveys should be conducted to include all bird species, not just raptors.

Revisions to the TEIR have been made to specify that a nesting bird survey should be performed no earlier than 5 days before construction is initiated. The nesting bird survey will also be performed for all migratory nesting bird species, not just raptors.

A1-47

The commenter refers to the biological resources section and claims that Santa Rosa Plain is well within the distribution for western pond turtle. The commenter claims that there is a western pond turtle occurrence less than 1.5 miles from the existing facility, and the statement that the BSA does not contain suitable habitat for this species is incorrect.

Refer to Responses to Comments A1-40 through A1-45. The BSA consists of off-reservation areas immediately bordering the project site (Figures 7 and 8 of the DTEIR), which does not contain suitable habitat to support western pond turtle. Western pond turtle was included in Table 4.4-1 of the Draft TEIR as it was identified as a special-status species known to occur in the region of the Project Site. As stated within Table 4.4-1 of the Draft TEIR, western pond turtles require permanent or nearly permanent water with basking sites. Wetlands within the Biological Study Area (BSA) lack sufficient water for a sufficient period of time to support western pond turtles, and basking sites are absent. Regardless, wetlands would not be impacted. Although the Santa Rosa Plain is within the distribution for this species, suitable habitat does not occur within the BSA.

A1-48

The commenter asserts that the TEIR should include survey methods, dates, and results to support the determination that special-status plants are presumed absent within the BSA. The commenter points out that the Draft TEIR's conclusion that no special status plant species have been observed in the BSA during surveys does not warrant the presumption that the plants are absent. The commenter further states that BMPs should be implemented as mitigation measures.

Refer to Responses to Comments A1-40 through A1-45. Draft TEIR Table 4.4-1 acknowledges the special-status plants that have the potential to occur within the BSA. The impact area will be limited to developed areas.

A1-49

The commenter does not have any comments regarding the geology and soils section of the Draft TEIR.

Comment noted.

A1-50

The commenter notes that the Draft TEIR estimated that the Proposed Project would generate approximately 8,055 tons of CO2 equivalents per year of greenhouse gas emissions, with 1,755 CO2e from onsite energy usage and 6,115 CO2e from VMT. The commenter claims that the Draft TEIR, without providing quantitative estimates, assumes various BMPs would offset the GHG emissions of the Proposed Project. The commenter alleges that similar to air quality analysis, the project cannot determine the cumulative effect of a project based on its individual impact.

Refer to Responses to Comments A1-09, A1-13, A1-17, and A1-39.

A1-51

The commenter does not have any comments regarding the hazards and hazardous materials section of the Draft TEIR.

Comment noted.

A1-52

The commenter discusses Sonoma Water's flood control responsibilities for Hinebaugh Creek, Bellevue-Wilfred Flood Control Channel, and the Laguna De Santa Rosa. They further express the concern of Sonoma Water regarding the operation maintenance of these facilities, urging that the Tribe provide design plans showcasing the details of development in or adjacent to Sonoma Water property. For site-specific improvements, Sonoma Water staff recommends that the drainage design for the project comply with Sonoma Water's Flood Management Design manual.

Refer to Response to Comment A1-07. Development of the Proposed Project would occur on trust land and would not occur adjacent to Hinebaugh Creek, Bellevue-Wilfred Flood Control Channel, and the Laguna De Santa Rosa. Additionally, a site plan is included as Figure 3 of the Draft TEIR.

A1-53

The commenter notes the projected increase in water demands from the Santa Rosa Plain Sub-basin. The comment includes two quotes from the Draft TEIR related to thresholds of significance and potential impacts. The comment does not identify concerns with the level of impacts or mitigation presented within the Draft TEIR.

Refer to Response to Comment A1-05.

A1-54

The commenter encourages the Tribe to pursue the mitigation measure recommended in the Draft TEIR that involves purchasing recycled water from the City of Rohnert Park to offset groundwater pumping. Additionally, the commenter suggests funding additional projects that reduce groundwater demands or supplement groundwater supplies.

If the City of Rohnert Park is unable to provide recycled water, or sufficient recycled water, the Tribe has the option, under Mitigation Measure 4.8-2, to construct an on-reservation wastewater treatment plant to produce recycled water on-site. Additionally, Mitigation Measure 4.8-2 outlines a third groundwater injection option and acknowledges that a combination of the options may be implemented.

The Tribe is a member of the Groundwater Sustainability Agency (GSA) Advisory Committee, and already has or currently funds two well monitoring programs to monitor potential impacts of the Resort on nearby groundwater wells (see Mitigation Measure 4.8-1). The Tribe has donated millions of dollars to various entities throughout the years, and has contributed sizeable payment regarding groundwater impacts per their IGA with the County.

A1-55

The commenter discusses the drainage infrastructure of the existing resort facility and surrounding area. The commenter requests that stormwater infrastructure be designed in accordance with Phase I MS4 Permit standards and the most recent version of the Low Impact Development Manual for volume detention and water quality requirements. They suggest that the Proposed Project should be designed as if those requirements legally apply.

Refer to Response to Comment A1-07.

A1-56

The commenter notes that the existing Joint Exercise of Power Agreement between the Tribe and the City of Rohnert Park provides a discharge allowance into Rohnert Park's Sanitary Sewer System sufficient to serve the existing Resort and Proposed Project. The commenter notes this would not create a significant impact associated with wastewater management of the Proposed Project.

Comment noted.

A1-57

The commenter alleges that the Proposed Project will nearly double the current groundwater use at the existing facility, absent of the mitigation measures being implemented. The commenter also provides on-site water usage.

Refer to Responses to Comments A1-05 and A1-54.

A1-58

The commenter states that the Final TEIR should commit to a net-zero impact for the proposed expansion's groundwater use based on the condition of the Santa Rosa Sub-Basin and the analysis of the groundwater experts who prepared the Water and Wastewater Study included as Appendix E of the Draft TEIR.

Refer to Responses to Comments A1-05 and A1-54. As discussed within Appendix E of the Draft TEIR, a less-than-significant impact can be achieved through mitigation. As the Proposed Project is on trust land, it is not required to adhere to net-zero requirements.

A1-59

The commenter states that Impact 4.9-1 of the Draft TEIR reads '…the Proposed Project could conflict with an off-reservation land use plan…' and that the area where the Proposed Project is located is classified as Agricultural per the Sonoma County General Plan and the Project Site is fully within an area that has been previously disturbed and developed, which is a best-case scenario.

To clarify, the quote from the Draft TEIR provided by the commenter is the impact analysis question copied directly out of Appendix A of the TEIR (Tribal-State Compact Checklist). All impact statements in the TEIR are written in the same manner. The text provided under the impact analysis question for Impact 4.9-1 confirms that no land use conflict occurs, as noted by the commenter. Comment noted regarding the development footprint being previously disturbed and a best-case scenario.

A1-60

The commenter notes Impact 4.9-2 of the Draft TEIR states that "…the Proposed Project could conflict with an applicable habitat conservation plan…' and that the mitigation measures within the Section 4.4 of the Draft TEIR meet the intent of the guidance of the Santa Rosa Plain Conservation Strategy Area with regard to the California tiger salamander and requests this be considered as part of the analysis.

Refer to Response to Comment A1-59. The quote from the Draft TEIR provided by the commenter is the impact analysis question copied directly out of Appendix A of the TEIR.

A1-61

The commenter discusses the noise impacts of the rooftop restaurant. The commenter's concern is whether the rooftop restaurant will be used for entertainment purposes or in conjunction with amplified sound. The further concern of the commenter is if the restaurant is indoors or outdoors.

As noted within the project description, Section 3.2.1 of the Draft TEIR, the rooftop restaurant will be constructed above the casino floor expansion and encompass both indoor and outdoor components. The restaurant will serve as a dining facility and is not intended for hosting entertainment events.

A1-62

The commenter states that the Sonoma County 8.4 percent vacancy rate listed in Draft TEIR does not adjust for vacant units that are seasonal, recreational, or vacant for certain other reasons, and that the actual vacancy rate is about 1%.

The commenter does not cite the source of the statistic. Section 4.11 of the Final TEIR has been revised to provide additional information on vacancy rates and anticipated population growth. Revisions include the addition of the City of Rohnert Park's Regional Housing Needs Allocation data, comparable data of population growth from similar development, and definitions of vacancy rates for the California Department of Finance and the U.S. Census Bureau. With this additional information the Final TEIR determines that existing vacant units remain sufficient to support the anticipated population growth associated with the Proposed Project.

The County's recommendation that the Resort provide additional affordable units to mitigate the impact of the Proposed Project on housing affordability is acknowledged. Per the Tribe's existing agreements with the City and County, payment contributions for use towards housing are already made by the Tribe.

A1-63

Commenter discusses public services in relation to local law enforcement and fire service and requests additional information in order to inform the County for future amendments to existing service agreements.

Draft TEIR Section 4.12 has been revised to include additional quantitative analyses of law enforcement and fire/EMS utilization. Refer to Section 4.12.2 for a discussion regarding fire districts, current local agreements, CalFire services, and local fire department services.

A1-64

The commenter requests the addition of the Stony Point Road at Millbrae Avenue intersection and the impacts to Hwy 116 in the traffic analysis as the County has been experiencing additional traffic at this location and would like to understand the impacts.

An analysis of cumulative and cumulative plus project traffic conditions indicated it is unlikely any additional significant impacts would be identified at this intersection. This assumes the planned traffic signal and future widening of Stony Point Road are implemented. The Traffic Impact Assessment, included as Appendix G of the Draft TEIR, has been revised to reflect the anticipated phasing of development. Additionally, Section 4.13 of the Draft TEIR has been revised to include mitigation requiring updated traffic counts be completed to confirm the accuracy of potential traffic impacts at the time of development. Although impacts to Millbrae Avenue at Stony Point Road are not anticipated at this time, this intersection will be evaluated if future traffic counts indicate that impacts to this intersection may occur.

A1-65

The Commenter notes their earlier comments regarding utilities and service systems (wastewater, groundwater, surface water, and stormwater management).

Refer to the above Responses to Comments.

3.0 LETTER A2: CITY OF ROHNERT PARK

A2-01

The commenter states that the City of Rohnert Park welcomes the anticipated economic growth presented by the Proposed Project and expresses that the Draft TEIR is consistent with analyses conducted for development near the Proposed Project.

This comment has been noted.

A2-02

The commenter notes that the City concurs with the BMPs in the Draft TEIR and offers supplemental BMPs for the Tribe's consideration. The commenter provides an attachment (addressed by Response to Comment A2-10) for the consideration of BMPs that: (i) were discussed in the Draft TEIR but not captured as BMPs, (ii) are discussed in the Draft TEIR to address potential impacts but are not identified as mitigation measures, and (iii) are suggested by the City for future collaboration based on the City's perspective of effective ways to enhance development.

Comment noted. The Tribe will consider the BMPs noted by the City.

A2-03

The commenter brings attention to the Joint Exercise of Powers Agreement (JEPA) in regard to the provision of wastewater services to the existing Resort. Further, the commenter notes the City's desire to amend the JEPA and recommends adding a BMP to the Final TEIR to identify the Tribe's intent to amend the JEPA.

Mitigation Measure 4.8-2 of the Final TEIR has been revised to note that should the purchase of reclaimed water option be chosen, the JEPA will be amended accordingly in coordination with the City. Mitigation Measure 4.8-3 has been added to reflect that although the time for the Tribe to exercise its option to purchase Phase 2 capacity has expired, the Tribe would amend the JEPA with the City to utilize the Phase 2 allowance to accommodate wastewater of the Proposed Project.

A2-04

The commenter refers to Attachment 1 of the comment letter and requests the inclusion of measures set forth in the Santa Rosa Groundwater Sustainability Plan to mitigate increased groundwater pumping impacts on the basin. The commenter also notes that the Proposed Project discharges stormwater off-site and should therefore design stormwater infrastructure to City and NCRWQCB standards.

Refer to Response to Comment A1-07, which discusses revisions to the grading and drainage study (Appendix D of the Draft TEIR) and confirms that the Proposed Project is consistent with City and the NCRWQCB standards.
Refer to Response to Comment A1-05 and A1-54 regarding groundwater impacts and the Tribe's involvement as a member of the GSA Advisory Committee.

A2-05

The commenter expresses appreciation for the Tribe's support of the community and requests that a BMP regarding affordable housing outlined in Attachment 1 of the comment letter be included in the Final TEIR. The commenter also requests inclusion of the Regional Housing Needs Allocation for Sonoma County and the City of Rohnert Park be added to Section 4.11.1 Regulatory Setting of the Draft TEIR.

Section 4.11.1 of the Draft TEIR has been revised to include a discussion of the Regional Housing Needs Allocation.

A2-06 and A2-07

The commenter discusses the importance of ongoing collaboration between Sonoma County, the City, and the Tribe and expresses appreciation for Mitigation Measure 4.12-1 of the Draft TEIR.

Comment noted.

A2-08

The commenter expresses appreciation for the Tribe's previous contributions to the surrounding circulation infrastructure. The commenter notes that the City has commissioned an independent traffic study, included as Attachment 5 of the comment letter.

Comment noted. Refer to Responses to Comments A2-16 through A2-70 for responses to comments in Attachment 5 of the City's comment letter.

A2-09

The commenter states that the background traffic utilized in the Traffic Impact Study (TIS), included as Appendix G of the Draft TEIR, is based on growth rates and signal timing assumptions that would not necessarily reveal the "worst-case scenario" of the Proposed Project's circulation impacts. The commenter requests that the TIS be revised accordingly and that Mitigation Measure 4.13-1 of the Draft TEIR be revised consistent with the language provided in Attachment 3 of the comment letter.

Analysis in the TIS (Appendix G of the Draft TEIR) is based on assumptions related to post-pandemic population growth and transportation patterns that likely were not accounted for in models prepared prior to 2020. The TIS considered the shift to working from home and e-commerce that was not anticipated in most pre-pandemic traffic models. In addition, the TIS indicated that some motorists would likely choose alternate routes when Golf Course Road is over capacity. However, the TIS has been revised, as requested, based on the Sonoma County model assuming full buildout of the Northwest Specific Plan.

These revisions serve to present the "worst-case" circulation scenario and remove assumptions related to post-pandemic population growth and driving behavior as well as driver selection of alternate routes during times of high traffic volume.

Additionally, the TIS has been revised to account for the anticipated phasing of project development. Mitigation Measure 4.13-4 has been added to the Final TEIR to reflect that traffic counts will be updated to confirm consistency with the TIS at the time of development.

A2-10

The commenter outlines BMPs that the City suggests the Tribe adds to the Draft TEIR.

Comment noted. The Tribe will consider implementation of additional BMPs. Revisions to select BMPs have been incorporated into Section 3.0 of the Final TEIR.

A2-11

The commenter points out that the Tribe's option to purchase additional wastewater treatment capacity under the JEPA has expired. However, the commenter states that the expiration date may be extended through amendments to the JEPA, and that the City wishes to amend the JEPA accordingly. The commenter also recommends a BMP to clarify the intent to amend the JEPA for additional capacity purchase.

Refer to Response to Comment A2-03.

A2-12

The commenter expresses support of the option to purchase recycled wastewater from the City. The commenter notes that this could be done through modifications to the City's Producer-Distributor Agreement with the City of Santa Rosa. The commenter encourages adding a BMP to the project description that clarifies the intent to amend the JEPA.

Please see Response Comment A2-03 for a discussion on amending the JEPA.

A2-13

The commenter provides a discussion of drainage infrastructure of the Resort and City. The commenter states that the Proposed Project's drainage system should be designed consistent with the NCRWQCB and the City's stormwater design standards. The commenter also states that dischargers into the City's municipal stormwater system must enter into a master maintenance agreement with the City regarding maintenance of LID features. The commenter requests that a BMP be added to confirm with the NCRWQCB standards.

Please see Response to Comment A1-07, which discusses revisions to the grading and drainage study (Appendix D of the Draft TEIR) and confirms that the Proposed Project is consistent with City and the NCRWQCB standards. As the drainage infrastructure will be maintained by the Tribe within trust land, the Tribe is not required to enter into a master maintenance agreement with the City in order to govern maintenance of drainage features on trust land. A BMP regarding consistency with the NCRWQCB requirements is not necessary as the project design already complies with the NCRWQCB standards in the absence of additional BMPs.

A2-14

The commenter requests that the Tribe expand Mitigation Measure 3.13-1 to specify the infrastructure improvements that the Tribe will contribute fair share payments towards.

Refer to Response to Comment A2-09.

A2-15

The commenter provides information on the existing City easement for sanitary sewer facilities in support of comment A2-10.

A BMP to avoid the City's sewer main and utility easement as described in Attachment 4 of the comment letter has been added to Section 3.0 of the Draft TEIR.

A2-16

The commenter discusses the review of the TIS and summarizes the Proposed Project.

Comment noted.

A2-17

The commenter summarizes that Streetlight Data was used to verify the adequacy of assumptions applied to the TIS.

Comment noted.

A2-18

The commenter provides an estimate of existing casino trip generations based on the 2019 Streetlight Data. The commenter states that, based on the Streetlight Data, the TIS should have included an analysis of weekend midday traffic.

Refer to response to comment A2-09. Section 4.13 of the Draft TEIR has been revised to consider the phasing of development. The 2019 Streetlight data provides information on pre-pandemic traffic volumes and may not fully reflect present-day volumes and driving behavior. Therefore, traffic counts will be updated to confirm consistency with the TIS at the time of development and will include weekend counts as applicable. Should updated traffic counts identify additional unanticipated significant impacts, additional mitigation will be recommended at that time.

Additionally, while the TIS (Appendix G of the Draft TEIR) did not provide a full analysis of weekend conditions, it did include an evaluation of whether project-related impacts during these periods would occur in exceedance of weekday peak hour volumes. The TIS (Appendix G of the Final TEIR) has been revised based on County traffic modal volumes, and it was concluded that the background traffic during these times is low enough that potentially significant operational weekend impacts would not exceed the weekday and Friday peak periods, even when considering the updated traffic modeling. It is further noted that the City's General Plan only specifies intersection LOS standards for the PM peak commute hour.

A2-19

The commenter identifies a minor discrepancy regarding the square footage of the proposed hotel and notes this may result in an inconsequential underestimation of trip generation.

The TIS in (Appendix G of the Final TEIR) has been revised to correct this error.

A2-20

The commenter concurs with the weekday pm peak hour trips presented within the TIS (Appendix G of the Draft TEIR), and expresses the opinion that am peak hour trips overestimate trip generation. Additionally, the commenter re-states that the TIS did not assess weekend peak hour trip generation or traffic operation despite high background and project-generated traffic levels.

Refer to Responses to Comments A2-09 and A2-18.

A2-21

The commenter provides a table that summarizes the anticipated trip generation. The commenter claims the Proposed Project would add more trips on the weekends than were analyzed within the TIS of the Draft TEIR. Specifically, they point out that the Sunday midday afternoon peak hour is anticipated to add over 1,000 trips in contrast to the analyzed 628 trips during the weekday pm peak hour.

Refer to Responses to Comments A2-09 and A2-18.

A2-22

The commenter notes that the theater volume graphics were not included in the TIS included as Appendix G of the Draft TEIR.

The TIS (Appendix G of the Final TEIR) has been revised to include the theater trip generation graphics.

A2-23

The commenter summarizes anticipated trip generation for the Proposed Project based on estimates provided in the TIS and estimates developed by W-Trans. The comment alleges that the Proposed Project is expected to add more trips on weekend days than were analyzed in the TIS for weekdays. The commenter also notes that the trip distribution graphic was not included in the appendix and summarizes their own review of the project trip distribution used in the TIS.

The TIS critical pm peak hour trip generation forecasts are higher than W-Trans' estimates. The underestimation of the pm peak hour trip generation forecasts is likely the result of using the 2019 generation data for the existing traffic counts and estimates based on other casinos. While the comment contends that the TIS should have evaluated other time periods, review of the data does not support the argument that weekend conditions would be the worst-case scenario. Additionally, the TIS (Appendix G of the Final TEIR) has been revised to include the trip distribution graphic.

A2-24

The commenter notes that there is considerable uncertainty in the trip distribution assumptions related to the 21.3 percent of trips assigned to Rohnert Park Expressway (RPX) east of Redwood Drive. The commenter speculates that much of the traffic would be oriented to the US 101 South via the RPX interchange with a smaller portion oriented to RPX east of the freeway. The commenter points out that the split assumed in the TIS is unknown. Furthermore, the commenter states the TIS should have assessed traffic operation at the RPX freeway ramps and RPX/Commerce Boulevard.

Refer to Responses to Comments A2-09 and A2-18. The LOS analysis indicated that in the future, some motorists would most likely choose to take other routes when Golf Course Drive would be at or near capacity and future forecasts and trip distribution were accounted for in the TIS of the Draft TEIR. A preliminary review of the intersections in question indicated that it is unlikely additional significant impacts would be identified beyond what has been identified the revised TIS (Appendix G of the Final TEIR) for Friday peak hour conditions.

A2-25

The commenter points out that the majority of the traffic orientation to US 101 is overestimated by the TIS. W-trans utilized Streetlight Data to conduct an origin-destination analysis and concluded that the total trip distribution to US 101 South would be approximately 33 percent (similar to existing Resort trip distribution). The commenter further explains the TIS overestimation due to the assignment of additional US 101 South traffic via RPX interchange. If half of the 21.3 percent assigned to RPX east of Redwood is assumed to be oriented to US 101 South, then the trip distribution would be similar to the existing Resort.

Refer to Response to Comment A2-24.

A2-26

The commenter claims that the applied 9.1 percent trip distribution to Golf Course Drive east of Commerce Boulevard is likely too high. The commenter notes that if the trip generation was at this level, the TIS should've analyzed operation at the Roberts lake intersection. However, the actual trip distribution to Golf course Drive east of Commerce Boulevard is likely to be much lower.

Refer to Response to Comment A2-24.

A2-27

The commenter discusses Figure 5 of the TIS, which displays no project-related traffic making westbound left-turns or northbound right turns at the intersection of Golf Course Drive West/Redwood Drive. However, the LOS calculation sheets indicate some traffic was assigned to those movements.

Figure 5 of Appendix G of the Final TEIR has been revised to include westbound left turns and right turns at the intersection of Golf Course Drive West/Redwood Drive.

A2-28

The commenter claims that the TIS would benefit from trip refinement due to overestimation and underestimation of turning movements. The effects of the trip distribution are likely pronounced at the Gold Course Drive interchange, Redwood Drive, US 101 South Ramps, Commerce Boulevard, and the US 101 North ramps. The commenter notes that the actual LOS effects at these locations may be somewhat worse that reflected in the TIS.

Refer to Response to Comment A2-24.

A2-29

The commenter notes that the TIS of the Draft TEIR presents an analysis of weekday peak hour traffic operation during two future year time horizons. The first is referred to as a "Baseline" and included a 10 percent increase to traffic volumes in 2022. The 10 percent growth is applied as a uniform factor to all intersection turning movements. The second time horizon is referred to as "Cumulative" and reflects the conditions of the year 2040.

Comment noted.

A2-30

The commenter notes the TIS cumulative volumes are based on the Sonoma County Traffic Model and Northwest Specific Plan but provides no details as to the source of volumes or methodology used to estimate growth on individual intersection turning movements. W-trans analyzed turning movements shown in the TIS and determined that the 2040 volumes were developed by applying an 18.6 percent growth factor to 2022 traffic volumes. The commenter criticizes the approach of using a basic uniform growth factor as it is not optimal for a complex roadway network, particularly in an interchange area.

The number in question was based on a 10 percent increase in traffic to 2025 and then a 0.5 percent per year increase in traffic from there to the year 2040.

A2-31

The commenter discusses the growth factor applied to the 2022 traffic volumes to project the 2040 volumes. They note that the source of the 18.6 percent value is unclear and that a review of the SCTA travel demand indicated p.m. peak hour volumes at the intersection of Golf Course Drive/Redwood Drive are projected to increase 23 to 28 percent by 2040 (absent of the expansion). The SCTA model also shows that east-west through movements are projected to encounter dramatic growth while other movements (to and from the northern leg of Redwood Drive) are projected to have much lower growth levels.

Refer to Response to Comment A2-30. The commenter does not raise concerns with the generation of traffic discussed in the Draft TEIR.

A2-32

The commenter summarizes their review of the TIS cumulative assumptions for growth and notes concerns about the use of a growth factor versus turning movements from the County model.
Refer to Response to Comment A2-30.

A2-33

The commenter notes that the LOS calculations reflected in the TIS appear to be based on reasonable assumptions at signalized and unsignalized intersections that are not part of coordinated signal networks. Several LOS results reported within and near the Golf Course Drive freeway interchange and Rohnert Park Expressway/Redwood Drive were better than expected. W-Trans investigated this further.

Comment noted.

A2-34

The commenter notes that all signalized intersections were assumed to operate independently with actuated, rather than, coordinated timing in the TIS. The assumption also does not account for the minimum green times needed for pedestrian crossings. The comment also notes that, in many cases, the optimized cycle lengths were substantially lower than those in the field.

The TIS of the Draft TEIR does assume that intersections operate independently as the worst-case assumption. Typically, assuming traffic signals are coordinated together will improve the LOS results, and the TIS did confirm this was the case with the Golf Course Drive intersections. Assuming the signals are coordinated results in a slight improvement to the LOS at these intersections. The signal cycle lengths used in the Synchro model of the TIS model do not appear on the LOS printouts in the appendix. The TIS analysis was based on cycle lengths of 120 seconds for all intersections, except for the main entrance intersection on Golf Course Road at Labath Avenue, which was assumed to have a 110-second cycle length. These cycle lengths were not optimized between scenarios and remained the same in all scenarios.

A2-35

The commenter continues their discussion regarding signal timing assumptions.

Refer to Response to Comment A2-34.

A2-36

The commenter discusses signalized intersections at and within the Golf Course Drive interchange. The commenter claims that the close spacing of these signals heavily influences one another and that the TIS provides an incomplete picture of these influences. Further, the commenter claims that the TIS did not include any queuing analyses or assessments of how the signal system functions as a whole which is crucial for analyzing cumulative conditions and determining infrastructure.

Refer to Response to Comment A2-34.

A2-37

The commenter points out that the TIS did not include an analysis of weekend afternoon peak hours. Combined, these effects limit the LOS analysis of the TIS from determining infrastructure modifications needed to support the project and background growth.
Refer to Responses to Comments A2-09 and A2-14. Updated review found no evidence that analysis of additional weekend time periods would yield other useful information about the project's potential to cause operational impacts. This is especially true since the City's General Plan only specifies intersection LOS standards for the PM peak commute hour.

A2-38

The commenter discusses mitigation in the TIS of the Draft TEIR, which entails widening Golf Course Drive West to accommodate dual westbound left-turns onto Labath Avenue and the Project Site. The commenter notes that this measure is not impacted by the comments above and is therefore an appropriate roadway improvement.

Comment noted.

A2-39

The commenter discusses the second mitigation measure (MM 2b) which entails minor roadway striping, updating the southbound US 101 off-ramp approach at Golf Course Drive to remark the center lane as a left-turn/through-right-turn lane utilization patterns. The commenter is unsure if this recommendation should be maintained as W-Trans believes that a superior option would be to add a second dedicated right-turn lane through minor widening and/or potential use of the wide shoulder and sidewalk. This shoulder and sidewalk were constructed to accommodate future transit but have remained unused.

Comment noted.

A2-40 through A2-44

The commenter points out that both the City and Tribe have an interest in ensuring that residents, employees, and visitors have adequate transportation facilities in place in both the near-term and the future. They further explain that W-trans has developed a list of potential roadway improvements to provide additional traffic capacity.

Refer to Responses to Comments A2-09 and A2-18.

Regarding the Dowdell Extension, the TIS did not identify direct impacts associated with the Proposed Project in this area. Other infrastructure improvements have been added to Section 4.13 of the Final TEIR as Mitigation Measure 4.13-5 to offset traffic impacts of the Proposed Project, especially those associated with post-event theater conditions on weekends.

A2-45

The commenter summarizes their recommendation for routine monitoring and adjustments to the Golf Course Drive and Rohnert Park Expressway signal systems.

Sections 3.0 and 4.13 of the Draft TEIR discussed the implementation of a Traffic Control Plan for special events at the theater to resolve any traffic safety issues, potential congestion, or delay.

A2-46

The commenter summarizes their recommendation for improvements at the Rohnert Park Expressway/Redwood Drive intersection.

Refer to Responses to Comments A2-09 and A2-18.

A2-47

The commenter notes that the TIS analysis of potential VMT per employee for the proposed project uses the baseline values available in the SCTA travel demand model. The TIS indicates that the project needs to reduce its VMT per employee by over 50 percent to meet the applicable significance threshold. The commenter claims that this reduction is infeasible and the resulting VMT impact is significant and unavoidable. W-Trans concurs with the TIS findings of VMT per employee and notes that the Transportation Demand Management (TDM) plan should be prepared with specific measures or reduction targets.

Refer to Responses to Comments A2-09 and A2-18.

A2-48 and A2-49

The commenter notes the TIS analysis is not compliant with CEQA.

Refer to Response to Comment A1-15.

A2-50

The commenter discusses VMT reduction strategies identified by W-Trans that could reduce the VMT impact as well as effects on traffic operation. These recommendations include the operation of a shuttle to Rohnert Park SMART station and bus hub on Commerce Boulevard, subsidies for employee transit passes, incentives for visitors who use transit, operation of vanpools for employees, expansion of the regional bus service, construction of offsite pedestrian bicycle facilities (Dodwell Avenue, Millbrae Avenue, Laguna de Santa Rosa along Hinebaugh Creek), the contribution of funds for a pedestrian-bicycle overcrossing at Copeland Creek, and implementation of paid visitor parking.

Refer to Response to Comment A1-17.

A2-51

The commenter notes that the TIS concludes that the Proposed Project would not adversely affect non-auto modes including transit users, bicyclists, and pedestrians. W-Trans concurs that CEQA-related impacts to these users are unlikely to occur. However, they recommend that improvements to these modes will play an important role in reducing VMT and traffic impacts and recommend added shuttles, vanpools, transit subsidies, and new multi-use pathways.

Refer to Response to Comment A1-15.

A2-52

The commenter summarizes their analysis of post-event Friday evening traffic operations and presents additional infrastructure improvement recommendations to address this scenario.

Refer to Responses to Comments A2-09 and A2-18.

A2-53

The commenter summarizes their analysis of the proportionate share of the improvements that have been recommended and the resulting project share of growth.

Refer to Responses to Comments A2-09 and A2-18.

A2-54

The commenter summarizes their analysis of daily trip generation from the existing Resort and the highest peak hour volume on weekends.

Comment noted.

A2-55

The commenter notes that no weekend trip generation information is provided. The commenter also notes that the theater trip generation is not provided in the appendix.

Refer to response to comment A2-37. The requested information is now included in the revised TIS technical appendix.

A2-56

The commenter notes that based on the existing Resort trip generation, the Proposed Project will generate more peak hour traffic on weekend afternoons (particularly Sundays) than during the weekday pm peak hours included in the TIS.

Refer to Response to Comment A2-37.

A2-57

The commenter concludes that the TIS did not capture the projects worst-case effects on the LOS as it does not assess weekend afternoon peak hour trip generation or traffic operation.

Refer to Response to Comment A2-37.

A2-58

The commenter notes that the TIS' distribution of vehicle trips would benefit from refinement as some locations of origins/destinations appear five to ten percent too high or low. The effects of trip distribution on LOS would likely be the most pronounced at the Golf Course Interchange area intersections.
Refer to Response to Comment A2-24.

A2-59

The commenter points out that approximately 21.3 percent of trips were assigned to RPX east of Redwood Drive for the operational analysis. They claim it is unclear what portion of these trips are oriented to the US 101 South versus RPX to the east of the freeway. Further, additional intersections at the RPX interchange and Commerce Boulevard should have been analyzed given the number of trips being assigned to this area.

Refer to Response to Comment A2-24.

A2-60

The commenter discusses background forecasts used in the TIS and their bases on a flat growth rate of 18.6 percent applied to all turning movements. The commenter claims that outputs from the SCTA model indicate that average 2040 growth should be higher (23 to 28 percent) and that traffic growth would vary based on turning movement.

Refer to Response to Comment A2-09.

A2-61

The commenter claims that methodologies in the TIS used to analyze unsignalized and isolated signals appear to be reasonable despite the unrealistic timing assumptions used at the Golf Course Drive interchange-area signals and the intersection of Rohnert Park Expressway and Redwood Drive.

Refer to Response to Comment A2-34.

A2-62

The commenter claims the LOS analysis contained in the TIS is of limited use in determining appropriate traffic improvement measures due to the lack of analysis during weekend afternoon peak periods and unrealistic signal timing assumptions at interchange-area intersections.

Refer to Response to Comment A2-37.

A2-63

The commenter notes that the TIS conclusion of a significant and unavoidable impact related to the project's VMT per employee is appropriate. The commenter claims that the TIS should have included an analysis of VMT associated with guests as a significant and unavoidable impact would likely be associated. The existing Resort has an average trip length of 24.6 miles on weekdays and 32.7 miles on weekends.

The commenter notes the TIS does not evaluate VMT associated with guest travel and should also have included an analysis of VMT associated with guests. A discussion of VMT analysis can be found in Response to Comment A2-48. The commenter also concurs with the TIS conclusion that the impact on VMT per employee is significant and unavoidable.

A2-64

The commenter notes that the TIS indicates the TDM plan would be required to mitigate VMT impacts but provides no specific measures for implementation.

Refer to Response to Comment A2-47

A2-65

Commenter claims that post-event conditions on Friday evenings can be maintained within the LOS D range as long as the signal system is operating at peak efficiency and the intersection improvement recommendations to Golf Course Drive West/Redwood Drive and Golf Course Drive/US 101 South Ramps are implemented.

Refer to Responses to Comments A2-09 and A2-18.

A2-66

Commenter notes the Proposed Project is estimated to be responsible for 29 to 43 percent of future traffic growth occurring at intersections in need of future infrastructure improvements.
Refer to Responses to Comments A2-09 and A2-18.

A2-67

The commenter recommends that the City should work with the Tribe to implement physical infrastructure improvements aimed at maintaining traffic flow in the areas where the Proposed Project would generate traffic.

Refer to Responses to Comments A2-09 and A2-18.

A2-68

The commenter recommends roadway improvements to help offset the Proposed Project’s adverse effects on traffic operations.

Refer to Responses to Comments A2-09 and A2-18.

A2-69

The commenter suggests a list of TDM measures that would be expected to help offset VMT impacts and reduce adverse effects on traffic operations.

Refer to Responses to Comments A2-09 and A2-18.

A2-70

The commenter recommends that additional measures should be implemented to accommodate surges in event traffic generated by the theater, including manual traffic control at both the intersections of Golf Course Drive West/Labath Avenue and Business Park Drive/Dowdell Avenue.
Refer to Responses to Comments A2-09 and A2-18.

4.0 LETTER A3: SANTA ROSA PLAIN GROUNDWATER SUSTAINABILITY AGENCY

A3-01

The commenter presents comments on behalf of the members of the Santa Rosa Plain Groundwater Sustainability Agency (GSA). Appreciation is expressed for the opportunity to comment on the DTEIR.

Comment noted.

A3-02

The commenter notes the evaluation of potential impacts on groundwater conditions within the Santa Rosa Plain Sub-basin that were identified within the DTEIR. The commenter encourages the pursuit of the mitigation measures in the DTEIR.

Comment noted.

A3-03

The commenter suggests funding projects that reduce groundwater demand or supplement groundwater supplies.

Refer to Response to Comment A1-54.

A3-04

The commenter urges the Tribe to conduct an analysis of the potential impacts on groundwater-dependent ecosystems.

Refer to Response to Comment A1-54. A statewide spatial database has been prepared that considers data from the California Department of Water Resources, the California Department of Fish and Wildlife, and the Nature Conservancy to identify groundwater dependent ecosystems within the state of California. Several potential groundwater dependent ecosystems are present in the vicinity of the Project Site. Significant effects to groundwater could affect the quality and quantity of groundwater dependent ecosystems in the vicinity of the Project Site. Section 4.8.3 of the TEIR includes mitigation measures to offset potential impacts associated with groundwater.

A3-05

The commenter asks the Tribe to consider the installation of low-flow fixtures and other water reduction technology to be included as mitigation measures instead of as BMPs. Additionally, the commenter requests that Mitigation Measure 4.8-2 be revised to specify the amount of groundwater offset necessary to reduce impacts to a less-than-significant level.

Per Section 4.8.4 of the DTEIR, the projected water demand of the Proposed Project is 153,900 gpd. This number does not include implementation of BMPs. Therefore, the analysis is conservative in using the full 153,900 gpd operational demand value. The significance determination also assumed an absence of BMPs. The BMPs are not necessary to reduce impacts to less-than-significant, and would be implemented in addition to the mitigation measures in Section 4.8.3 of the TEIR.

Appendix D of the DTEIR discusses the amount of water needed to offset significant impacts (35 gpm to ensure the Resort in combination with the Proposed Project uses 200 gpm or less). Mitigation Measure 4.8-2 has been revised in the FTEIR to reflect this number.

A3-06

The commenter discusses their appreciation of the collaborative relationship between the GSA and the Tribe. Additionally, the GSA hopes to continue engaging in development that includes water resource planning that benefits the Tribe and local community.

Comment noted.

A3-07

The commenter requests that the Tribe analyze the effects of groundwater usage on groundwater-dependent ecosystems.

Refer to Response to Comment A3-04.