

**CALIFORNIA ENVIRONMENTAL QUALITY ACT  
NOTICE OF DETERMINATION**

To: Office of Planning and Research  
State Clearinghouse  
P.O. Box 3044, 1400 Tenth Street, Room 212  
Sacramento, CA 95812-3044

From: City of San Pablo  
Planning Division  
1000 Gateway Avenue  
San Pablo, CA 94806

**Subject:** FILING OF NOTICE OF DETERMINATION IN COMPLIANCE WITH SECTION 21108 OF THE PUBLIC RESOURCES CODE

**Project Title:** 2364 Road 20

**State Clearinghouse Number:** 2008082069

**Project Location:** 2364 Road 20, San Pablo, CA

**County:** Contra Costa

**Project Applicant:** Arris Studio Architects

**Project Description:** The project activities involve construction and operation of 64 residential units in a five-story building placed on a 1.04-acre site which is consistent with the land use and zoning specified in the General Plan. The development will be accomplished through the approval of a Major Design Review, Conditional Use Permit, and Density Bonus with Waivers/Concessions and Variances for the proposed project on the site.

The City of San Pablo utilized information and analysis in the 2030 San Pablo General Plan environmental impact report (EIR) to support a final determination about the type of environmental document required to be prepared for the 2364 Road 20 project as provided by Sections 15162, 15163, and 15164 of the California Environmental Quality Act (CEQA) Guidelines, which was determined to be an Addendum. The EIR was adopted by the City of San Pablo on September 19, 2011. The EIR evaluated the potential environmental effects of developing the 2364 Road 20 site, and the project will be consistent with the overall assumptions for development on the 2364 Road 20 site as presented in the General Plan.

As Lead Agency under the CEQA, the City of San Pablo approved the above-described project on October 25, 2022 and has made the following determinations:

1. The project will not have a significant effect on the environment.
2. An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures were not made a condition of project approval.
4. A Statement of Overriding Considerations was not adopted for this project.
5. Findings were made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative declaration, is available to the General Public at:

City of San Pablo, Planning Division, 1000 Gateway Avenue, San Pablo, CA 94806

Contact Person:  
Elizabeth Tyler, Ph.D, FAICP

Contact Title:  
Community Development Director

Phone Number:  
(510) 215-3036

Signature:



Date:

October 26, 2022

Date Received for Filing and Posting at OPR: \_\_\_\_\_

**Addendum to the  
City of San Pablo General Plan  
Environmental Impact Report**

**1.1 OVERVIEW**

On April 18, 2011, the City of San Pablo adopted the General Plan environmental impact report (EIR), which included analysis of the potential environmental impacts associated with construction and operation of a partially vacant lot at 2364 Road 20 (Project) in the City of San Pablo. The City of San Pablo General Plan specifically supports residential infill on vacant lots within existing neighborhoods (Policy LU-I-16). After the adoption of the EIR, the property owner submitted for approval of a Major Design Review, Conditional Use Permit, and Density Bonus with Waivers/ Concessions and Variances for the Project. The project will develop 64 residential units in a five-story building placed on a 1.04-acre site. The project will also include a parking garage and surface parking. The project will continue to be consistent with the land use and zoning for the Project site specified in the General Plan. However, the Project will exceed the allowed building height limit and will encroach into the side yard and creekbank setbacks. In response, the Project developer is requesting the grant of a density bonus in exchange for dedicating 10 percent of the allowable dwelling units (6 units) for very low-income households. By providing 6 units for very low-income households, the Project developer requests receiving two concessions (as allowed by California Government Code Section 65915(d)(2)(B)). One concession requested is for the required building height limit and one concession is for the encroachment into the side-yard setback. In addition, the Project has requested Density Bonus waivers/reductions or variances to allow for minor encroachments into the 30-foot from top of creekbank setback to accommodate support piers and a second level overhang and for an increase in the number of allowable stories from four to five. Density Bonus Law also allows a reduced off-street parking requirement which the project would meet by providing 72 parking spaces.

**1.2 PURPOSE OF ADDENDUM**

According to Section 15164 of the California Environmental Quality Act (CEQA) Guidelines, an addendum to a previously certified EIR or adopted negative declaration shall be prepared by a lead agency if changes or additions to the document are necessary but none of the conditions described in Section 15162 requiring the preparation of a subsequent EIR or negative declaration are applicable. An addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration. The decision-making body considers the addendum with the final EIR or adopted negative declaration prior to making a decision on the project, as modified.

Section 15162 of the State CEQA Guidelines states that, for a project covered by a certified EIR or adopted negative declaration, preparation of a subsequent EIR or negative declaration is required if one or more of the following conditions occur:

1. Substantial changes are proposed in the project that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.
2. Substantial changes occur with respect to the circumstances under which the project is undertaken that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
  - a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
  - b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
  - c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
  - d. Mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

### 1.3 SCOPE AND CONTENT OF ADDENDUM

This Addendum has been prepared in accordance with the requirements of the CEQA (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (Title 14 California Code of Regulations Section 15000 et seq.). The City of San Pablo considered each of the environmental impacts that were analyzed in the prior EIR and focused on determining whether the modified project would result in an increase in the severity of the impacts identified in the prior EIR or would result in any new impacts not previously considered in the prior EIR.

### 1.4 CONCLUSION

Based on review of the project and of the previous analysis, the City of San Pablo determined that the potential environmental impacts associated with a Major Design Review, Conditional Use Permit, Density Bonus Concessions/Waivers, and Variances for a development project on the 2364 Road 20 site have been fully analyzed and addressed in the previously prepared EIR and will not result in conditions outlined in State CEQA Guidelines Section 15162 that would require preparation of a subsequent EIR. Existing General Plan policies and implementation measures identified in the General Plan EIR will continue to reduce the potential effects of development of the 2364 Road 20 site to less than significant levels.

Project site current land use is designated Vacant in the General Plan Land Use Element. In addition, the General Plan includes Implementing Policy LU-I-16 which identifies the City supports residential infill on vacant lots within existing neighborhoods. This policy also identifies residential infill on vacant lots should be sensitive to the design elements (building elements, setbacks, and heights) of adjacent properties. As described previously, the project requested concessions for height and side yard setback and waivers/variance for an increase in the number of stories and encroachments in to the top-of-bank creek setback in exchange for providing 10 percent of the allowable dwelling units (6 units) for very low-income households. Related to open space requirements, the project will construct limited portions of the building inside the required 30-foot setback from the top of bank for the San Pablo Creek (for the southern portion of five support columns and to allow up to five-foot of overhang on the second level). It should be noted that the previously existing development on the site extended past the 30-foot setback and a few feet over the San Pablo Creek itself. In addition, there are no sensitive biological resources in or near the portion of San Pablo Creek adjacent to the project site (see further discussion below). Related to building heights, the tallest buildings in the project area are 2-½ stories in height on the north side of Road 20 (residences addressed at 110 through 114 Road 20). The project will construct a building double the height of any nearby buildings. However, the project site is envisioned for future high-density residential uses and vacant lots are encouraged to be developed for residential infill (Implementing Policy LU-I-16). In addition, surrounding land uses include high-density residential uses located along Road 20 and across San Pablo Creek to the south. Overall, the project will not be required to meet requirements for setbacks and building heights with approval of the requested concessions/waivers; however, the project is considered consistent with the City's General Plan intent and vision for future development at the site (conformance with Implementing Policy LU-I-16).

As mentioned previously, the project will provide the minimum required number of parking spaces, as modified by Density Bonus Law. In addition, the project site was previously used for an unpermitted tow truck operation. Therefore, the project was examined to determine if potentially new or increased impacts related to traffic, cultural resources, biological resources, or soils could occur.

#### Traffic Impact Analysis

A project-specific Traffic Impact Analysis Report (Traffic Report) was conducted to analyze the potential traffic impacts from implementing a residential development comprising of a new 64-unit multi-family building, consisting of four levels of dwelling units and one level parking garage. The Traffic Report considered all housing units will be studio or two-bedroom units and be located at the of single family and multifamily land uses. The Traffic Report provides an intersection Level of Service (LOS) analysis and a vehicle miles traveled (VMT) analysis along with evaluations and recommendations concerning project site access and on-site circulation for vehicles, bicycles, and pedestrians. The Traffic Report is provided as **Attachment A** to this Addendum.

The Traffic Report evaluated traffic conditions at two study intersections (San Pablo Avenue/Road 20-23rd Street (signalized), El Portal Drive/Road 20 (signalized)) during the a.m. and p.m. peak hours for a typical weekday. The study intersections were selected in consultation with City of San Pablo staff. The peak periods were determined to occur between 7:00 a.m. – 9:00 a.m. and 4:00 p.m. – 6:00 p.m. The proposed project is expected to generate approximately 23 weekday a.m. peak hour trips (6 inbound trips, 17 outbound trips), and 29 weekday p.m. peak hour trips (18 inbound trips, 11 outbound trips). Based on this estimated trip generation, all of the study intersections will continue to operate within applicable jurisdictional LOS standards of LOS D or better during both peak hours under existing plus project conditions. However, it should be noted that the addition of project trips will further

increase the queue lengths that already exceed existing storage lengths at the San Pablo Avenue/Road 20-23rd Street intersection.

The Traffic Report concludes circulation aisles satisfy the minimum 22 feet requirement from the City of San Pablo Municipal Code. However, the Traffic Report recommended the proposed project perform a truck turning analysis to confirm a variety of trucks, including garbage trucks and emergency vehicles, can adequately circulate on-site. The Traffic Report continues to conclude that the project will not conflict with existing and planned pedestrian facilities and will not conflict with existing and planned bicycle facilities.

#### *VMT Analysis*

The Governor's Office of Planning and Research (OPR) Technical Advisory (December 2018) provides guidance to analysts and local jurisdictions for implementing VMT as a metric for determining the transportation impact for land use projects. The OPR guidelines state that for analysis purposes, "VMT" refers to automobile VMT, specifically passenger vehicles and light trucks. Heavy truck traffic is typically excluded. The Contra Costa County *Transportation Analysis Guidelines* (June 2020) provide additional guidance on evaluating VMT impacts from projects within the County.

Both the OPR and County guidelines provide standards for identifying which projects should be exempt from further VMT analysis, based on characteristics such as their size, proximity to transit, or expected number of total daily trips. The Traffic Report determined the project is exempt from VMT requirements per Contra Costa County *Transportation Analysis Guidelines* which states:

*There are five screening criteria that lead agencies can apply to screen projects out of conducting project-level VMT analysis. Even if a project satisfies one or more of the screening criteria, lead agencies may still require a VMT analysis if there is evidence that the project has characteristics that might lead to a significant amount of VMT.*

*2.4: Projects Located in Transit Priority Areas (TPAs). Projects located within a TPA can be presumed to have a less-than significant impact absent substantial evidence to the contrary.*

The Traffic Report determined the project meets the Transit Priority Area exemption because the project is located within a half mile of a high transit frequency bus stop (under 15-minute headways). The project is also located in a Metropolitan Transportation Commission defined transit rich Priority Development Area (PDA) called the "San Pablo Avenue & 23rd Street Corridor." For these reasons, the project is exempt from conducting a project specific VMT analysis.

#### *Parking Supply*

As mentioned previously, the Project will provide the minimum required number of parking spaces under State Density Bonus Law, but would not meet the pre-empted local parking requirements (72 spaces provided, 94 spaces required). The project site is located in a Transit Priority Area and transit rich PDA which reduces the demand, and thereby the needed supply, for onsite parking. Based on the location of the project site in an area with readily available public transit (bus stop with under 15-minute headways) and close access (within a half mile of a high transit frequency bus stop), the number of parking spaces provided by the project are considered sufficient and will avoid any potential conflicts with City of San Pablo policy.

#### Cultural Resources Study

A project-specific Cultural Resources Identification Study (Cultural Study) was prepared to determine whether the project could result in significant impacts to historical and archaeological resources as defined by CEQA Section 15064.5. The Cultural Study includes a Northwest Information Center (NWIC) records search; literature, historical map, and aerial photo review; local historical group consultation; archaeological buried site sensitivity analysis; pedestrian survey; and evaluation of the property for inclusion in the California Register of Historical Resources (California Register). The Cultural Study is provided as **Attachment B** to this Addendum.

The Cultural Study considered the project to involve demolishing an existing single-family residence and large shed and constructing a new multifamily five-story residential building. The Cultural Study assumed development would include 64 multifamily rental units, a parking garage, surface parking, and parking lifts. The Cultural Study identifies the San Pablo Creek runs along the southern end of the parcel and assumed no structures will be constructed within a 30-foot setback from the top bank of the creek. Lastly, the Cultural Study identifies two existing decks on the site, which extend through the 30-foot setback and over the creek top of the bank, will be removed as part of the project.

NWIC staff conducted a cultural resources records search (File No. 21-1074) of the project area and a half-mile search radius on February 7, 2022. As part of the records search and background research, the following federal and California inventories were reviewed:

- National Register of Historic Places (National Register) (National Park Service 2022)
- California Points of Historical Interest (OHP 2022a)
- California Historical Landmarks (OHP 2022a)
- Archaeological Determinations of Eligibility (OHP 2012)
- California Inventory of Historic Resources (1976)
- Built Environment Resources Directory for Contra Costa County (OHP 2022b). The directory includes resources reviewed for eligibility for the National Register and the California Historical Landmarks programs through federal and state environmental compliance laws, and resources nominated under federal and state registration programs, including the National Register, California Register, California Historical Landmarks, and California Points of Historical Interest.

No cultural resources were identified on the project and 13 cultural resources were identified within the half-mile search radius of the project. In addition, no cultural resources studies have been previously completed for the project site, but 45 cultural resource studies have been completed within the half-mile search radius.

Cultural staff reviewed literature, historical maps, and aerial photographs for historical information about the project area and the vicinity. A 1939 aerial photograph shows the property was undeveloped, and the neighboring parcels to the east and north were sparsely developed and appear to have supported agricultural uses. During World War II, the agricultural land across Road 20 to the north was developed with a temporary defense workers' housing project called El Portal Park. El Portal Park was later redeveloped with portions used to build a shopping center, tract homes, and Contra Costa Community College. USGS topographic quadrangle maps show the project area was developed with several buildings sited parallel to Road 20 as early as 1947. The county assessor's data for the extant building on the property indicates it was constructed in 1943. By 1952, the project site was in use as a nursery. Aerial photographs appear to show several buildings on the project site parallel to the road through about 1980. The western side of the property was cleared of structures by the late 1980s. The property was sold and ceased being used as a nursery in approximately the late 2000s.

On February 1, 2022, an archaeologist conducted a pedestrian survey of the project area. The exposed ground surface was walked over in single transects spaced approximately 15 meters apart. No cultural materials or anthropogenic soils were identified within the project area during the survey.

Sensitivity for cultural resources consisting of archaeological sites is considered moderate based upon the known cultural resources in the vicinity of the project, the shallow previous disturbance in the project area, and various natural factors including being located adjacent to San Pablo Creek, number of previously documented sites in the project vicinity, accumulating soil environment, and likely shallow ground disturbance from previous site construction. Therefore, the Cultural Study concluded the project site has moderate sensitivity for buried significant or potentially significant prehistoric or historic-period archaeology sites as a result of historic and modern development.

The Cultural Study concludes no historical or archaeological resources as defined by CEQA Section 15064.5(a) were identified on the project site as a result of the NWIC records search, literature, map, and aerial photo review, historical society consultation, pedestrian survey, and California Register evaluation. The Cultural Study also concludes that sensitivity for buried archaeological resources is moderate because there is a potential for disturbing previously unknown archaeological resources during ground-disturbing activities associated with project construction. However, the City of San Pablo's General Plan (Implementing Policy OSC-I-15) requires pre-construction surveys and monitoring during any ground disturbance for all development in areas of historic or archaeological sensitivity. In addition, Implementing Policy OSC-I-16 of the City's General Plan requires educating developers and the community-at-large about the connections between Native American history and the environmental features that characterize the local landscape. Because appreciating, protecting, and preserving known and unknown cultural resources is standard City policy and will be implemented as a condition of approval for the project, potentially significant impacts to unknown cultural resources will be avoided.

#### Biological Resources Study

A project-specific Biological Resources Technical Memorandum (Bio Study) was prepared to evaluate the existing biological conditions of the project site with the goal of determining whether the site provides any habitat value for endangered, rare, or threatened species. The Bio Study considered the project to involve the construction of a new multi-family five story residential building on the existing developed area of a 1.04-acre parcel southeast of the Road 20 and San Pablo Avenue intersection. The Bio Study assumed development will include 64 rental units,

a parking garage, surface parking, and parking lifts. The Bio Study identified the San Pablo Creek runs along the southern end of the project site and, other than the southern portions of five narrow support columns, no structures will be constructed within a 30-foot setback from the creek top of bank. The Bio Study also identified two existing decks on the parcel that extend through the 30-foot setback and over the creek top of bank and assumed the decks will be removed as part of the project. The Bio Study is provided as **Attachment C** to this Addendum.

A biologist conducted a reconnaissance survey of the project sites on September 8, 2021, between the hours of 3:00 p.m. and 4:00 p.m. to document existing site conditions, assess vegetation communities, and evaluate the potential for the project site to support special status species habitat, including sensitive plant and wildlife species. A biologist also conducted record searches of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB, nine-quad search). The California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants and the United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) were also accessed for the Bio Study to obtain comprehensive information regarding State- and federally-listed species, as well as other special status species and sensitive plant communities considered to have potential to occur or known to occur within the *Richmond, California* USGS 7.5-minute topographic quadrangle and/or surrounding eight quadrangles.

The Bio Study identified the project site as including developed area on the northern half of the site along Road 20 and a fragment of riparian woodland along San Pablo Creek at the southern edge of the site. The developed area of the project site is paved or graveled and surrounded by wooden or chain-link fencing. Existing structures occur on the eastern half of the site, including a house with an attached deck that extends south towards the creek, a large shed at the northeast corner of the site, and a smaller deck at the southeastern edge of the site. The house is currently occupied by tenants who operate a tow truck company from the site. A paved area on the western half of the site is used as a parking lot. Although largely devoid of plants, small patches of ruderal vegetation and escaped ornamentals are present in the developed area. Despite the presence of a perennial creek (San Pablo Creek), the area surrounding the project site is heavily developed and urbanized. The creek itself is disturbed by anthropogenic activity and invasive plant species.

The Bio Study concluded that the narrow band of riparian woodland on either side of San Pablo Creek within and adjacent to the project site contains both native and non-native species but is disturbed by anthropogenic activities and largely isolated as a result of surrounding residential and commercial development. Riparian vegetation and the aquatic habitat of San Pablo Creek within the project site may provide marginally suitable habitat for wildlife, including steelhead, Cooper's hawk, nesting birds, and roosting bats. However, the project is designed to only impact previously developed areas and avoid impacts within 30 feet of the San Pablo Creek top of bank. Therefore, implementation of the project is unlikely to affect special status species.

The Bio Study also concludes that if any trees or vegetation must be impacted as part of construction activities, the City of San Pablo's General Plan (Implementing Policy OSC-I-8) requires scheduling of construction and vegetation removal outside of nesting bird season or conducting a preconstruction nesting bird survey. If removal of mature trees is required, the General Plan (Implementing Policy OSC I-9) requires a pre-construction acoustic survey to determine if bats are present. Any disturbance to San Pablo Creek water quality through removal of the deck structures will be avoided through implementation of best management practices (BMPs) such as preparing and implementing a stormwater pollution prevention plan, as required by Implementing Policy OSC I-9 in the General Plan and the Municipal Code (Chapter 17.40). Because protecting nesting birds, roosting bats, and water quality is standard City policy and will be implemented as a condition of approval for the project, potentially significant impacts to special status species and their habitats will be avoided.

#### Geotechnical (Soils) Analysis

Based on historic uses at the site, a project-specific Soil Analysis was conducted to analyze the potential environmental issues with onsite soils. Three soil discrete samples were collected from the site and no known past environmental issues or concerns exist at the site. Soil samples were analyzed for the presence of asbestos, organochlorine pesticides, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organics, metals, total petroleum hydrocarbon (TPH) as gasoline with benzene, toluene, ethylbenzene, and xylene (BTEX) and Methyl tert-butyl ether (MTBE), and TPH-diesel and TPH-motor oil. The Soil Analysis is provided as **Attachment D** to this Addendum.

Only arsenic was detected in the three soil samples at concentration of 6.2 milligrams per kilogram (mg/kg), 6.5 mg/kg, and 9.4 mg/kg which exceed the environmental screening levels (ESL) standards. However, the indicated level is not considered to be high enough to be a concern because background arsenic levels are naturally elevated in the Bay Area, and in any case are not high enough to warrant soluble threshold limit concentration (STLC) testing. The San Francisco Regional Water Quality Control Board (RWQCB) references a 2011 Master's thesis that

evaluates background arsenic concentrations in the San Francisco Bay Region. This thesis proposes an upper (99th percentile) estimate of background arsenic of 11 mg/kg within undifferentiated urbanized Bay Area flatland soils.

Chromium was detected in one soil sample at a concentration of 67 mg/kg, above the Tier 1-ESLs. Soluble threshold limit concentrations (STLC) is used to define the “soluble fraction” that classifies a “waste” as California hazardous. Non-hazardous disposal facilities utilize a rule-of-thumb guideline to interpret total contaminant concentrations relative to the STLC hazardous waste criteria. Soils or waste with total contaminant concentrations in excess of 10 times the STLC (50 mg/kg) have the potential to be classified as hazardous and they are also analyzed by the California Waste Extraction Test (WET) when the subsequent solute analysis results exceed the STLC for chromium (5 mg/L). The result of the STLC for chromium was not detected in the lab. Therefore, the soil is not considered to be a California hazardous waste.

Overall, the project site does not contain any substantial soil contaminants that are considered hazardous to future residential uses.

The project will be consistent with the overall assumptions for development on the vacant site as presented in the General Plan and the project will not result in any new significant impacts or increase the severity of any potentially significant impacts identified in the General Plan EIR. The circumstances under which the project will be undertaken have not substantially changed such that new or substantially increased impacts will occur. Further, there is nothing peculiar about the project or the project site that will result in impacts substantially greater than discussed in the prior EIR. Therefore, no further environmental analysis is required.

# Draft Traffic Impact Analysis Report

## **2364 Road 20**

San Pablo, California

September 22, 2021



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Appendix B – Existing Conditions Intersection Level of Service and Queuing Analysis Work Sheets

Appendix C – Existing plus Project Conditions Intersections Level of Service and Queuing Work Sheets

## EXECUTIVE SUMMARY

This report summarizes the results of the Traffic Impact Analysis (TIA) conducted for the residential development located at 2364 Road 20 in City of San Pablo, CA. The development comprises of a new 64-unit multi-family building, consisting of four levels of dwelling units and one level parking garage. All housing units will be studio or two-bedroom units. The proposed development will be located on the south side of Road 20, approximately 375 feet east of the Road 20/San Pablo Avenue intersection. The proposed development edges single family and multifamily land uses. Other surrounding land uses include a retail center and a middle school.

This report provides the intersection Level of Service (LOS) related to the project. Additionally, the report also includes vehicle miles traveled (VMT), evaluations and recommendations concerning project site access and on-site circulation for vehicles, bicycles, and pedestrians.

To evaluate the impacts on the transportation infrastructure due to the addition of traffic from the proposed project, two study intersections were evaluated during the weekday morning (a.m.) peak hour and evening (p.m.) peak hour under two study scenarios. The study intersections were evaluated under *No Project* and *Plus Project* scenarios for Existing Conditions. For the purpose of this analysis, potential traffic operational effects from the proposed project are identified based on established operational thresholds described in the report.

### ***Project Trip Generation***

The proposed project is expected to generate approximately 23 weekday a.m. peak hour trips (6 inbound trips, 17 outbound trips), and 29 weekday p.m. peak hour trips (18 inbound trips, 11 outbound trips).

### ***Existing Conditions***

Under this scenario, all of the study intersections operate within applicable jurisdictional LOS standards of LOS D or better during both peak hours.

### ***Existing plus Project Conditions***

Under this scenario, all of the study intersections continue to operate within applicable jurisdictional LOS standards of LOS D or better during both peak hours.

### ***Queueing Analysis***

The following are movements where the addition of project trips would further increase the queue lengths that already exceed existing storage lengths:

- San Pablo Avenue/Road 20-23<sup>rd</sup> Street
  - ✓ Eastbound left-turn lane during the p.m. peak hour only. Eastbound through-left lane during both peak hours.
  - ✓ Westbound through-left lane during both peak hours.
  - ✓ Northbound left-turn lane during the p.m. peak hour only.

- ✓ Southbound left-turn lane during the a.m. peak hour only. Southbound through lane during the p.m. peak hour only. Southbound right-turn lane during the p.m. peak hour only.

### **Site Access and On-Site Circulation**

The proposed vehicular access to the project site is via one project entrance on Road 20. Main driveway access is to the proposed parking garage. From the site plan, it appears that existing sidewalks and on-street parking along the project frontage will be maintained. Sight distance between vehicles travelling westbound on Road 20 and vehicles exiting the project site is clear and visible for at least 200 feet; however, sight distance between vehicles travelling eastbound on Road 20 and vehicles exiting the project site is slightly obstructed by the horizontal curvature of Road 20, west of the project site. TJKM recommends the project use landscaping below eye level to avoid further obstructing sight distance west of the project site.

Based on the current site plan, circulation aisles seem to satisfy the minimum 22 feet requirement from the City of San Pablo Municipal Code. The proposed project should perform a truck turning analysis to confirm a variety of trucks, including garbage trucks and emergency vehicles, can circulate on-site. Based on a preliminary review of the project site plan, the site access and on-site circulation is considered adequate.

### **Pedestrian Impacts**

The proposed project should provide adequate street lighting at the project driveway. The proposed project does not conflict with existing and planned pedestrian facilities; therefore, the impact to pedestrian facilities is **less than significant**.

### **Bicycle Impacts**

The project does not conflict with existing and planned bicycle facilities; therefore, the impact to bicycle facilities is **less than significant**.

### **Transit Impacts**

The project site is within walking distance to various AC Transit bus stops on Road 20 and San Pablo Avenue. Impacts to transit service are expected to be **less than significant**.

### **Vehicle Miles Traveled**

Since the proposed project is exempt from CEQA (CEQA exemption #15332), in accordance to CCTA VMT requirements, it is also not required to conduct a VMT analysis.

## 1.0 INTRODUCTION

This report summarizes the results of the Traffic Impact Analysis (TIA) for the proposed residential development located in City of San Pablo, California.

### 1.1 PROJECT DESCRIPTION

The project proposes to develop 42,842 square feet (sq. ft.) of multifamily residential use, including four levels of dwelling units and one level parking garage. The project proposes to provide 72 parking spaces in a one-story parking garage.

The project is located on the south side of Road 20 between San Pablo Avenue and El Portal Drive. The project entrances will consist of one new driveway into the parking garage. The project site is located across from the existing College Center and an existing multifamily development.

The following section discusses the TIA Purpose, study intersections, and analysis scenarios.

### 1.2 PROJECT PURPOSE

The purpose of the Traffic Impact Analysis is to evaluate the impacts on the transportation infrastructure due to the addition of the traffic from the proposed project. The report also includes evaluations and recommendations concerning Vehicle Miles Traveled (VMT), project site access and on-site circulation for vehicles, bicycles, and pedestrians, queuing analysis at the study intersections, and parking supply.

### 1.3 STUDY INTERSECTIONS

TJKM evaluated traffic conditions at two study intersections during the a.m. and p.m. peak hours for a typical weekday. The study intersections were selected in consultation with City of San Pablo staff. The peak periods were between 7:00 a.m. – 9:00 a.m. and 4:00 p.m. – 6:00 p.m. The study intersections and associated traffic controls are as follows:

1. San Pablo Avenue/Road 20 – 23<sup>rd</sup> Street (Signal)
2. El Portal Drive/Road 20 (Signal)

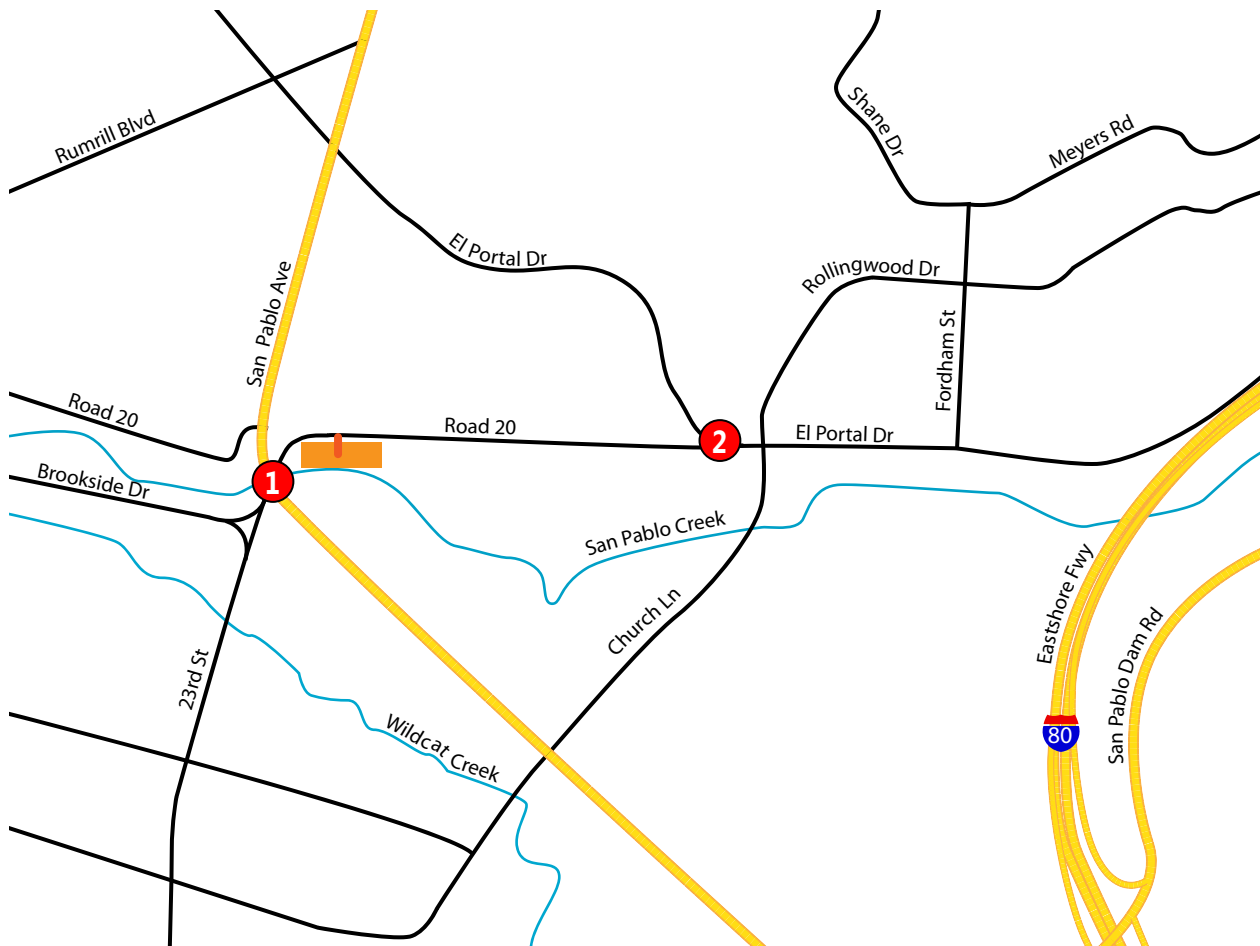
**Figure 1** illustrates the study intersections and the vicinity map of the proposed project. **Figure 2** shows the proposed project site plan.

### 1.4 ANALYSIS SCENARIOS

This study addresses the following two traffic scenarios:

- **Existing Conditions** – This scenario evaluates the study intersections based on existing traffic volumes, lane geometry, and traffic controls.
- **Existing plus Project Conditions** – This scenario is identical to Existing Conditions, but with the addition of traffic from the proposed project.

Figure 1: Vicinity Map

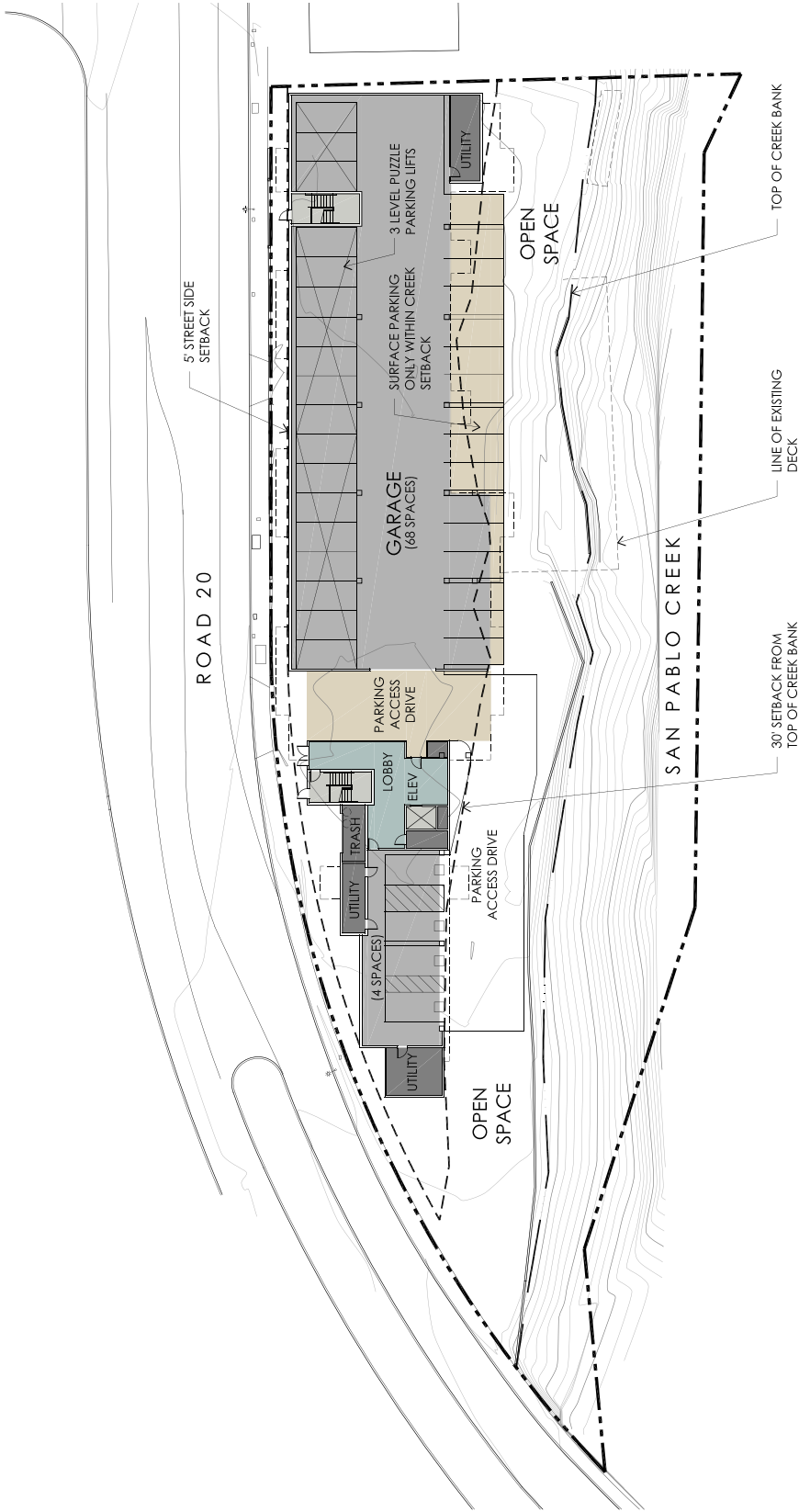


## LEGEND

-  Project Site
-  Study Intersection
-  Project Access



Figure 2: Site Plan



## 2.0 STUDY METHODOLOGY

Traffic impacts related to the proposed project were evaluated for both compliance with applicable regulatory documents and environmental significance as defined in the California Environmental Quality Act (CEQA). In CEQA published by the Governor's Office of Planning and Research (OPR), the July 1, 2020 Technical Memorandum prepared by Fehr & Peers describing the VMT methodology adopted by the Contra Costa Transportation Authority (CCTA). As of July 1, 2020, intersection level of service (LOS) can no longer be used to determine significant CEQA impacts.

### 2.1 LEVEL OF SERVICE ANALYSIS METHODOLOGY

Level of Service (LOS) is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. LOS generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The operational LOS are given letter designations from A to F, with A representing the best operating conditions (free-flow) and F the worst (severely-congested flow with high delays). The intersection capacity analysis was conducted using the Synchro 10th Edition software to implement the Highway Capacity Manual, 2000 Edition (Transportation Research Board, 2000) (HCM) methodology to determine the overall intersection delay. The HCM methodology calculates the average delay, in seconds, of a vehicle passing through the intersection in any direction. The average delay is used to determine the intersection LOS according to the LOS definitions provided in **Table 1**.

**Table 1: Level of Service Definitions for Intersections**

| Level of Service | Description                                                                                                                                                                                               | Delay in seconds         |                            |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------|
|                  |                                                                                                                                                                                                           | Signalized Intersections | Unsignalized Intersections |
| A                | EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.                                                                                                                | $\leq 10.0$              | 0.0-10.0                   |
| B                | VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.                                                                      | $> 10.0$ and $\leq 20.0$ | 10.1-15.0                  |
| C                | GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.                                                                                 | $> 20.0$ and $\leq 35.0$ | 15.1-25.0                  |
| D                | FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.                            | $> 35.0$ and $\leq 55.0$ | 25.1-35.0                  |
| E                | POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.                                                          | $> 55.0$ and $\leq 80.0$ | 35.1-50.0                  |
| F                | FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths. | $> 80.0$                 | $> 50.0$                   |

Source: Highway Capacity Manual 2000 (Transportation Research Board, 2000)

## 2.2 SIGNIFICANT IMPACT CRITERIA/LEVEL OF SERVICE STANDARDS

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines, Contra Costa County, City of San Pablo plans and policies, and professional standards, a project impact would be considered significant if:

- The project would conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the 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.
- The project conflicts with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.
- If the project substantially increases hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- The project results in inadequate emergency access

The following criteria are not subject to CEQA significance criteria but should be addressed as appropriate in the findings of the traffic study:

- If the project site design does not have adequate parking or circulation capacity to accommodate the anticipated demand
- If the project would result in inadequate internal circulation to accommodate project traffic.

**Table 2: Impact Criteria and Significance Thresholds**

| Intersection Control Type | Significant Impact Threshold                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Signalized                | <p>The Project</p> <ul style="list-style-type: none"> <li>• Causes an acceptable LOS (LOS D or better) to decline to an unacceptable LOS (LOS E or F), or</li> <li>• Increases the average delay by more than 5 seconds per vehicle at an intersection having an unacceptable LOS without project traffic.</li> </ul>                                                     |
| Unsignalized              | <p>The Project</p> <ul style="list-style-type: none"> <li>• Causes an acceptable LOS to decline to an unacceptable LOS, or</li> <li>• For intersections already operating at an unacceptable LOS without the project, it is considered a significant impact if the project related traffic increases the worst movement/approach delay by more than 5 seconds.</li> </ul> |

Source: *The San Pablo General Plan 2030 (April 2011)*

## 2.3 VEHICLE MILES TRAVELED

As the City of San Pablo does not currently have an adopted policy document regarding VMT standards or methodology, this study evaluates project-related VMT as outlined in the draft CCTA VMT

methodology<sup>1</sup>. This methodology includes a screening process, in order to streamline evaluation of projects that can be presumed to generate a less-than-significant impact on VMT by exempting them from further analysis. Absent evidence that the project has characteristics that might lead to a significant amount of VMT, a screened out project can be presumed to have a less-than-significant impact.

If a project meets any of the following screening criteria and does not have characteristics indicating high VMT generation, CCTA does not require further VMT analysis:

- Qualifies for CEQA exemption
- Considered a small project
- Contains only local-serving uses
- Located in Transit Priority Areas (TPAs)
- Located in low VMT areas.

VMT is further discussed in Section 5.4 of this report.

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<sup>1</sup> [Contra Costa County Transportation Analysis Guidelines](#)

### 3.0 EXISTING CONDITIONS

This section describes existing conditions in the immediate project site vicinity, including roadway facilities, bicycle and pedestrian facilities, and available transit service. In addition, existing traffic volumes and operations are presented for the study intersections, including the results of LOS calculations.

#### 3.1 EXISTING SETTING AND ROADWAY SYSTEM

Regional roadway facilities providing access to the proposed residential development is provided via San Pablo Avenue. Local access to the proposed project is provided via Road 20, El Portal Drive and 23<sup>rd</sup> Street.

**San Pablo Avenue** is a four-lane, north-south mixed use boulevard in the study area, extending from Hercules in the north to downtown Oakland to the south. In the project vicinity, the roadway features a raised median and on-street parking. San Pablo Avenue provides continuous sidewalks on both sides. Class II bike lanes exist on both sides of the roadway, south of Road 20. Continuous lighting is present via overhead street lights on both sides of the roadway. The posted speed limit is 35 miles per hour (mph) in the project vicinity.

**Road 20** is a two-lane, east-west Avenue in the City of San Pablo, extending between Rumrill Boulevard and El Portal Drive. Road 20 provides direct access to multifamily residential uses and a middle school. The roadway features a two-way left-turn lane median and on-street parking on both sides of the roadway. Continuous sidewalks provide pedestrian access along the roadway. Continuous lighting is present via overhead street lights on both sides of the roadway. The posted speed limit along Road 20 ranges from 15 to 30 mph, however a school zone speed limit of 25 mph is present in the study area.

**El Portal Drive** is a two- to four-lane, east-west arterial in San Pablo and Richmond. In the City of San Pablo, El Portal Drive is classified as an urban arterial between San Pablo Avenue and Church Lane and an auto arterial between Church Lane and eastern City limits. El Portal Drive provides residents access to and from I-80 to the east. In the project vicinity, the roadway continuous sidewalks on both sides. Class II bike lanes exist on both sides of the roadway, east of Church Lane. Continuous lighting is present via overhead street lights in a raised median. The posted speed limit along El Portal Drive is 30 mph.

**23<sup>rd</sup> Street** is a two- to three-lane, north-south mixed use boulevard in the study area, extending from San Pablo Avenue in the north to Cutting Boulevard to the south. This road provides residents access between San Pablo and the City of Richmond. In the project vicinity, the roadway has continuous sidewalks on both sides and Class II bike lanes exist on both sides of the roadway. Continuous lighting is present via overhead street lights on both sides of the roadway. The posted speed limit along 23<sup>rd</sup> Street is 25 mph in the project vicinity.

#### 3.2 EXISTING PEDESTRIAN FACILITIES

Walkability is defined as the ability to travel easily and safely between various origins and destinations without having to rely on automobiles or other motorized travel. The ideal “walkable” community includes wide sidewalks, a mix of land uses such as residential, employment, and shopping opportunities, a limited

number of conflict points with vehicle traffic, easy access to transit facilities and services and a network of pedestrian facilities. Pedestrian facilities are comprised of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access the destinations such as institutions, businesses, public transportation, and recreation facilities. Along the project frontage on Road 20, the width of the sidewalk is approximately six feet wide. All of the study signalized intersections have marked crosswalks with pedestrian pushbuttons and pedestrian signal heads.

At the intersection of San Pablo Avenue/Road 20-23<sup>rd</sup> Street and El Portal Drive/Road 20 there are ADA compliant curb-ramps and crosswalk markings. At the El Portal Drive/Road 20 intersection curb ramps at the northeast and southeast quadrants are not ADA-compliant. Throughout the project vicinity, Road 20, San Pablo Avenue, El Portal Drive and 23<sup>rd</sup> Street feature continuous sidewalks on both sides and high visibility crosswalks.

### 3.3 EXISTING BICYCLE FACILITIES

The 2017 City of San Pablo Bicycle and Pedestrian Master Plan outlines goals and objectives to improve the current active transportation system that includes walking and biking. The various bicycle facilities throughout the city are described below.

- **Class I Shared-Use Path:** Class I bikeways are a completely separate right-of-way designed for the exclusive use of cyclists and pedestrians, with minimal crossings for motorists. These paths are often located along creeks, canals, and rail lines.
- **Class II Bike Lanes:** Class II bike lanes use special lane markings, pavement legends, and signage. Bike lanes provide designated street space for bicyclists, typically adjacent to outer vehicle travel lanes. Buffered bike lanes increase separation through painted buffers between vehicle lanes and/or parking, and green paint at conflict zones (e.g., driveways or intersections).
- **Class III Bike Routes:** Bike routes provide enhanced mixed-traffic conditions for bicyclists through signage, sharrow striping, and or traffic calming treatments, and provide continuity to a bikeway network. Bike routes are typically designated along gaps between bike trails or bike lanes, or along low-volume, low-speed streets. Bicycle Boulevards further enhance bike routes by encouraging slower speeds and discouraging non-local vehicle traffic using traffic diverters, chicanes, traffic circles, and speed tables.
- **Class IV Bikeway:** Bikeways are also known as cycle tracks or separated bikeways, are set aside for the exclusive use of bicycles and physically separated from vehicle traffic. Separated bikeways were adopted by Caltrans in 2015. Separation may include grade separation, flexible posts, physical barriers, or on-street parking.

In the vicinity of the project, there are Class II bicycle facilities along 23<sup>rd</sup> Street, and El Portal Drive. Additionally, the Wildcat Creek Trail, a Class I shared use path, is accessible on 23<sup>rd</sup> Street, located 0.2 miles southwest of the project site. There are no bicycle facilities that provide direct access to the project site.

### 3.4 EXISTING TRANSIT FACILITIES

AC Transit provides transit service throughout Richmond, San Pablo, and East Contra Costa County. In the project vicinity, transit stops for AC Transit are located along San Pablo Avenue, 23<sup>rd</sup> Street, Road 20 and El Portal Drive. **Table 3** summarizes the existing AC Transit services in the project vicinity.

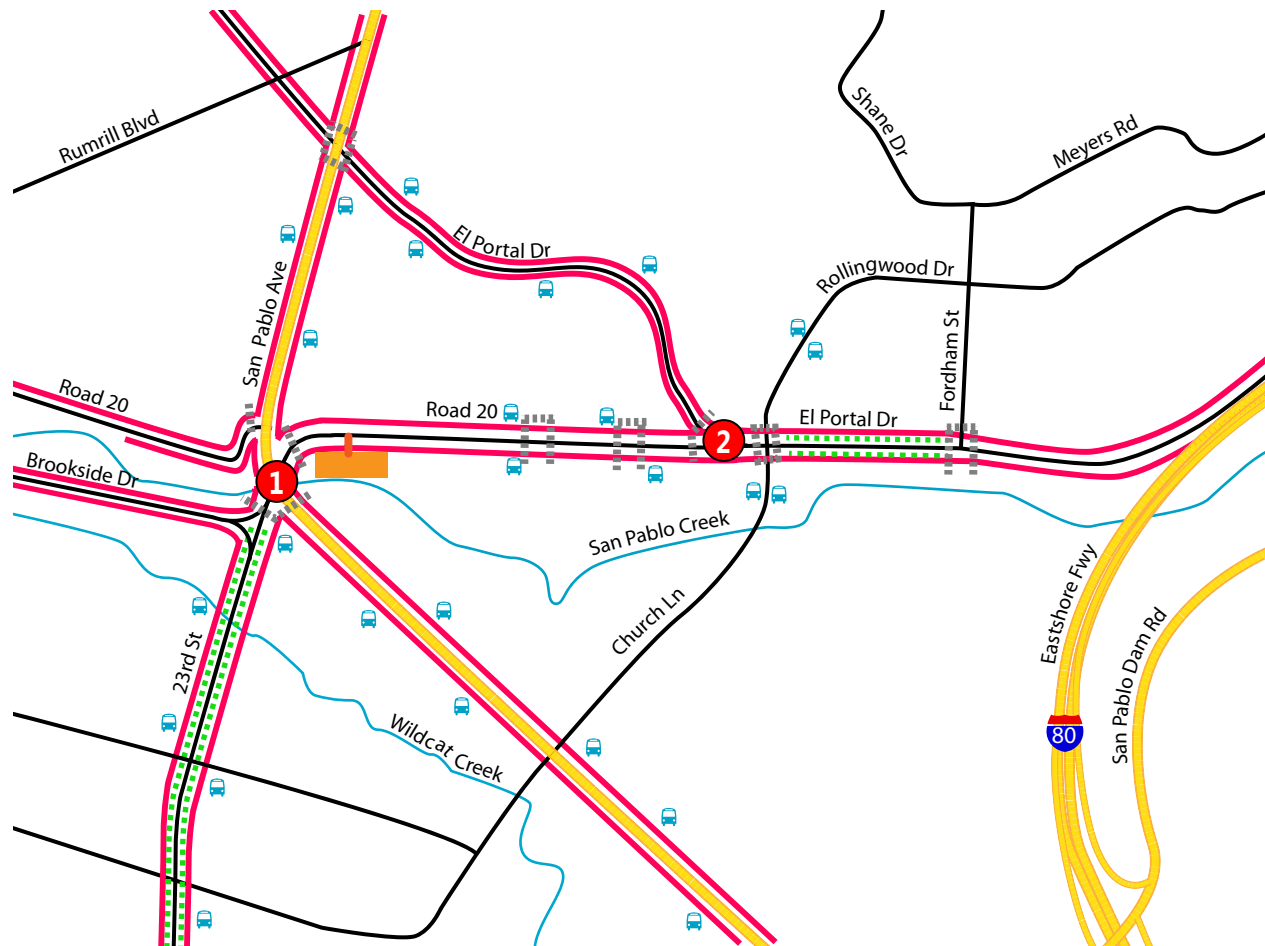
**Table 3: Existing Tri Delta Transit Service**

| Route | From                               | To                              | Weekdays              |                                | Weekends              |                   |
|-------|------------------------------------|---------------------------------|-----------------------|--------------------------------|-----------------------|-------------------|
|       |                                    |                                 | Operating Hours       | Headway (minutes)              | Operating Hours       | Headway (minutes) |
| 72    | Hilltop Mall                       | Jack London Square              | 5:07 a.m. – 1:02 a.m. | 19-40                          | 4:59 a.m. – 1:28 a.m. | 27-40             |
| 72R   | Jack London Square                 | Contra Costa College            | 5:50 a.m. – 8:01 p.m. | 6-22                           | 6:59 a.m. – 7:40 p.m. | 12-18             |
| 74    | Castro Ranch Rd/Sherwood Forest Dr | Harbour Way South/Ford Point    | 6:41 a.m. – 8:16 p.m. | 30-60                          | 6:42 a.m. – 8:14 p.m. | 30-62             |
| 76    | El Cerrito Del Norte BART          | Richmond Parkway Transit Center | 6:17 a.m. – 8:27 p.m. | 6-30                           | 6:33 a.m. – 8:27 p.m. | 30                |
| 607   | Richmond High                      | Point Richmond                  | 7:05 a.m. – 7:39 a.m. | One a.m. cycle only            | Not in Service        | Not in Service    |
| 669   | Crespi Middle                      | San Pablo Dam                   | 7:26 a.m. – 4:51 p.m. | One a.m. cycle; 77 for p.m.    | Not in Service        | Not in Service    |
| 676   | De Anza                            | Rollingwood                     | 7:47 a.m. – 4:19 p.m. | One a.m. cycle; 60-75 for p.m. | Not in Service        | Not in Service    |

Source: AC Transit Website

**Figure 3** illustrates existing pedestrian, bicycle and transit facilities in the project vicinity.

Figure 3: Existing Pedestrian, Bike, and Transit Facilities



## LEGEND

- |                                                                                                        |                                                                                                        |                                                                                                   |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|  Project Site       |  Sidewalk           |  Transit Stop |
|  Study Intersection |  Marked Crosswalk   |                                                                                                   |
|  Project Access     |  Class II Bike Lane |                                                                                                   |



### 3.5 EXISTING PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS

The existing operations of the study intersections were evaluated for the highest one-hour volumes during weekday morning and evening peak periods. Recent turning movement counts for vehicles, bicycles, and pedestrians were conducted during the weekday a.m. peak period (7:00 a.m.-9:00 a.m.) and p.m. peak period (4:00-6:00 p.m.) at the study intersections on Tuesday, August 31, 2021. TJKM compared the traffic counts at the intersection of San Pablo Avenue/Road 20-23<sup>rd</sup> Street and El Portal Drive/Road 20 before COVID-19 conditions (March 2019) and present traffic counts (August 2021) during the COVID-19 pandemic conditions. TJKM applied a growth factor of 1.08 during the a.m. peak hour and 1.05 during the p.m. peak hour to the present traffic volumes at San Pablo Avenue/Road 20-23<sup>rd</sup> Street intersection to establish baseline conditions. Similarly, TJKM applied a growth factor of 1.18 during the a.m. peak hour and 1.24 during the p.m. peak hour to the present traffic volumes at El Portal Drive/Road 20 intersection to establish baseline conditions. These adjustment rates were applied to all volume data including pedestrians and bicyclists at the two study intersections. **Appendix A** includes all data sheets for the collected vehicle, bicycle, and pedestrian counts. **Figure 4** illustrates the existing lane geometry, and traffic controls at the study intersections. **Figure 5** illustrates the existing a.m. and p.m. peak hour vehicle turning movement volumes at the study intersections.

### 3.6 INTERSECTION LEVEL OF SERVICE ANALYSIS – EXISTING CONDITIONS

Existing intersection lane configurations, signal timings, and turning movement volumes are used to calculate the level of service for the study intersections during each peak hour. **Table 4** below summarizes peak hour LOS at the study intersections under Existing Conditions. Due to the limitations of HCM 2010 methodology, the study intersections were evaluated using HCM 2000 Methodology.

Under this scenario, all of the study intersections operate at the applicable jurisdictional standards of LOS D or better during both peak periods. **Appendix B** contains the detailed LOS calculation sheets for Existing Conditions.

**Table 4: Intersection Level of Service Analysis – Existing Conditions**

| # | Intersection                                     | Control | Peak Hour <sup>1</sup> | Existing Conditions |                  |
|---|--------------------------------------------------|---------|------------------------|---------------------|------------------|
|   |                                                  |         |                        | Delay <sup>2</sup>  | LOS <sup>3</sup> |
| 1 | San Pablo Avenue/Road 20-23 <sup>rd</sup> Street | Signal  | A.M.                   | 53.2                | D                |
|   |                                                  |         | P.M.                   | 47.1                | D                |
| 2 | El Portal Drive/Road 20                          | Signal  | A.M.                   | 11.9                | B                |
|   |                                                  |         | P.M.                   | 8.2                 | A                |

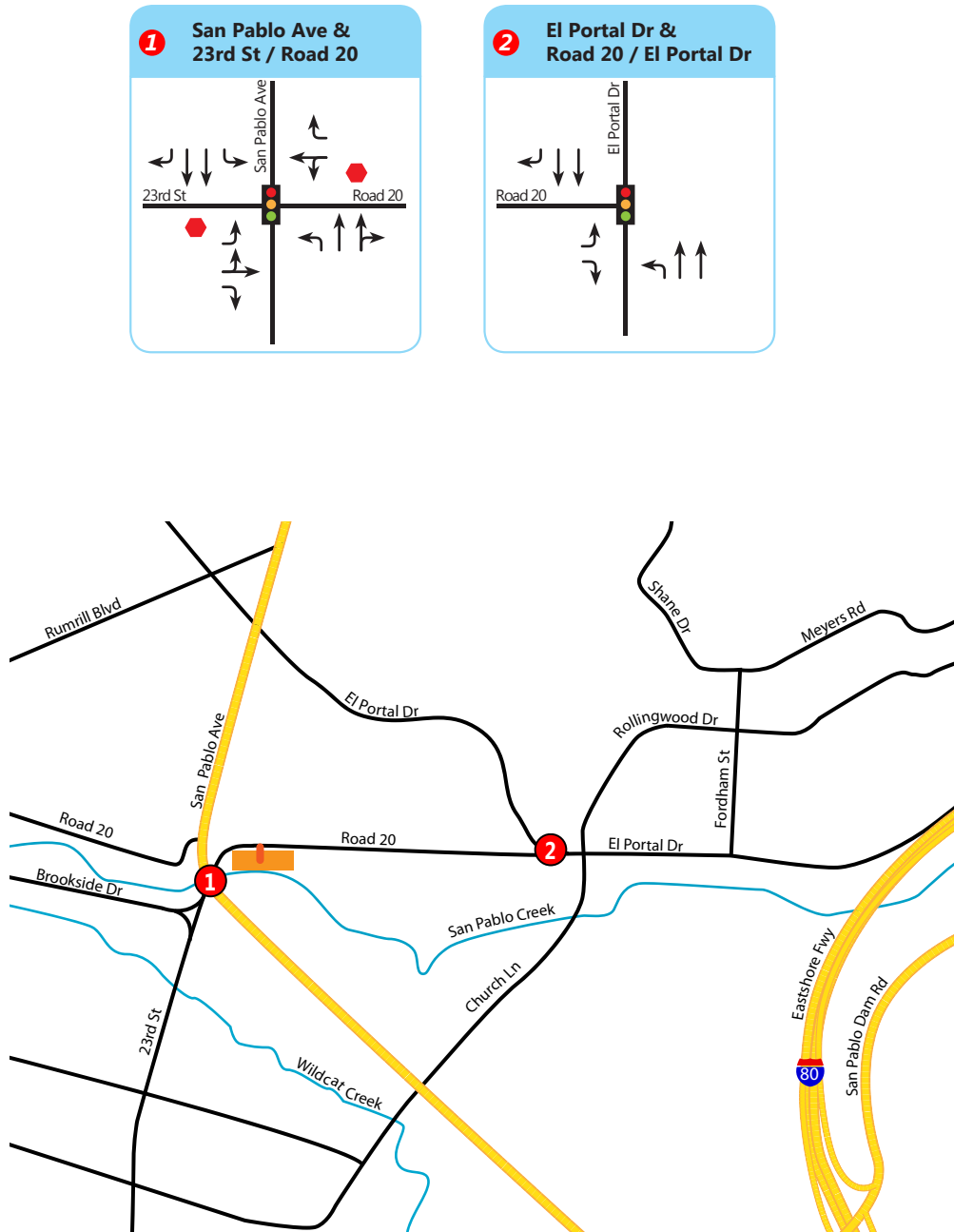
Notes:

1. AM – morning peak hour, PM – evening peak hour

2. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections.

3. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.

Figure 4: Existing Lane Geometry and Traffic Control

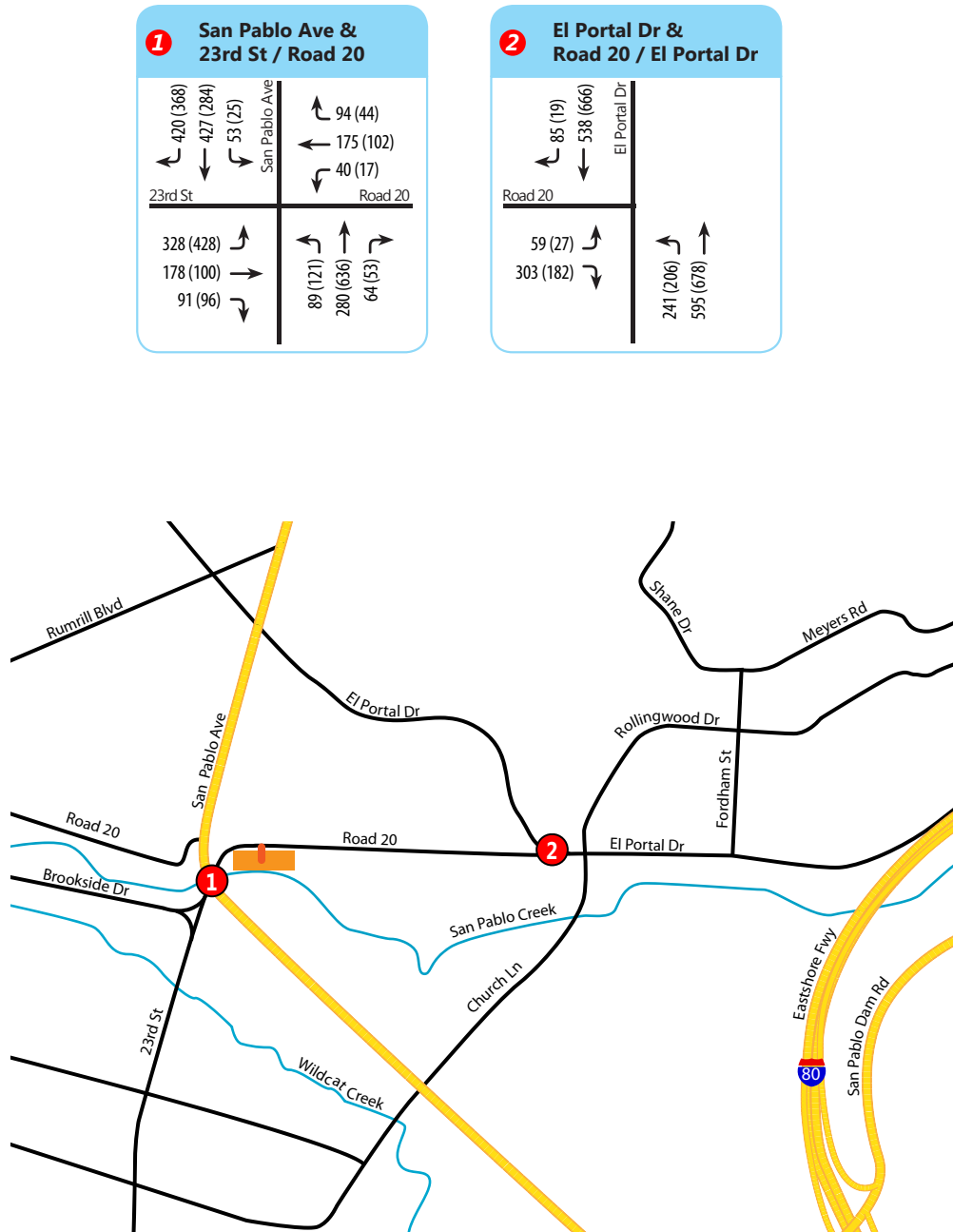


## LEGEND

- Project Site
- ⊗ Study Intersection
- Project Access
- ⬡ Stop Sign
- ⬢ Traffic Signal



Figure 5: Existing Peak Hour Traffic Volumes



## LEGEND

- Project Site
- ✕ Study Intersection
- Project Access
- XX AM Peak Hour Traffic Volumes
- (XX) PM Peak Hour Traffic Volumes



## 4.0 EXISTING PLUS PROJECT CONDITIONS

The impacts of the proposed project on the transportation system are discussed in this chapter. First, the method used to estimate the amount of traffic generated by the project is described. Then, the results of the level of service calculations for Existing plus Project Conditions are presented. (Existing plus Project Conditions are defined as Existing Conditions plus traffic generated by the proposed project). A comparison of intersections under Existing plus Project Conditions and Existing Conditions is presented and the impacts of the project on the study intersections are discussed.

The amount of traffic added to the roadway system by the proposed development is estimated using a three-step process.

- Trip Generation – Estimates the amount of traffic added to the roadway network,
- Trip Distribution – Estimates the direction of travel to and from the project site,
- Trip Assignment – The new trips are assigned to specific street segments and intersection turning movements.

### 4.1 PROJECT TRIP GENERATION

TJKM developed estimated project trip generation for the proposed project based on published trip generation rates from the *Institute of Transportation Engineers' (ITE) publication Trip Generation (10th Edition)*. TJKM used published trip rates for the ITE land use Multifamily Housing (Mid-Rise) (ITE Code 221) for the proposed residential development.

**Table 5** shows the trip generation expected to be generated by the proposed project. The proposed project is expected to generate approximately 348 net new daily trips, including 23 weekday a.m. peak hour trips (6 inbound trips, 17 outbound trips), and 29 weekday p.m. peak hour trips (18 inbound trips, 11 outbound trips).

**Table 5: Project Trip Generation**

| Proposed Land Uses (ITE Code)                     | Size  | Daily |            | AM Peak |          |             |           | PM Peak |          |              |           |
|---------------------------------------------------|-------|-------|------------|---------|----------|-------------|-----------|---------|----------|--------------|-----------|
|                                                   |       | Rate  | Trips      | Rate    | In/out % | In/out      | Total     | Rate    | In/out % | In/out       | Total     |
| Multifamily Housing (Mid-Rise) (221) <sup>1</sup> | 64 DU | 5.44  | 348        | 0.36    | 26/74    | 6/17        | 23        | 0.44    | 61/39    | 18/11        | 29        |
| <b>Total Net Trips</b>                            |       |       | <b>348</b> |         |          | <b>6/17</b> | <b>23</b> |         |          | <b>18/11</b> | <b>29</b> |

Source - ITE Trip Generation Manual, 10th Edition (2019).

<sup>1</sup>Multifamily Housing (Mid-Rise), General Urban/Suburban (ITE Land Use Code 221) vehicle trip rates are based upon number of dwelling units.

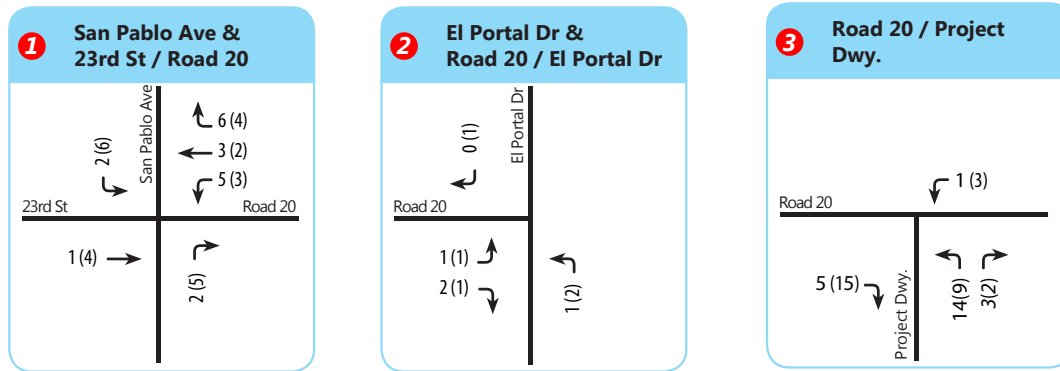
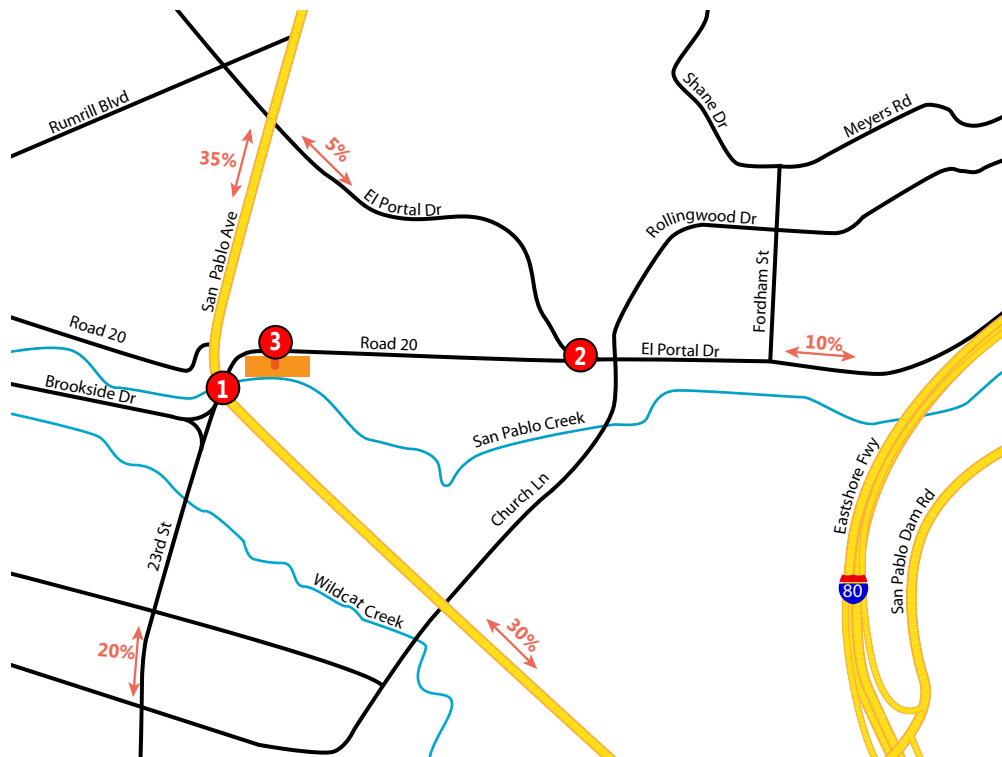
### 4.2 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution is a process that determines in what proportion vehicles would be expected to travel between the project site and various destinations outside the project study area and also determines the various routes that vehicles would take from the project site to each destination using the calculated trip

distribution. Trip distribution assumptions for the proposed project were developed based on existing travel patterns, and knowledge of the study area.

**Figure 6** illustrates the trip distribution percentages and trip assignment project volumes developed for the proposed project. The assigned project trips were then added to traffic volumes under Existing Conditions to generate Existing plus Project Conditions traffic volumes.

Figure 6: Project Trip Distribution and Assignment



## LEGEND

Project Site

Study Intersection

Project Access

XX AM Peak Hour Project Trips

(XX) PM Peak Hour Project Trips

Trip Distribution



### 4.3 INTERSECTION LEVEL OF SERVICE ANALYSIS – EXISTING PLUS PROJECT CONDITIONS

The intersection LOS analysis results for Existing plus Project Conditions are summarized in **Table 6**. The results for Existing Conditions are included for comparison purposes. **Figure 7** displays projected peak hour turning movement volumes at all of the study intersections for Existing plus Project Conditions.

All study intersections are expected to continue operating within applicable jurisdictional standards of LOS D or better under Existing plus Project Conditions. **Appendix C** contains the detailed LOS calculation sheets for Existing plus Project Conditions.

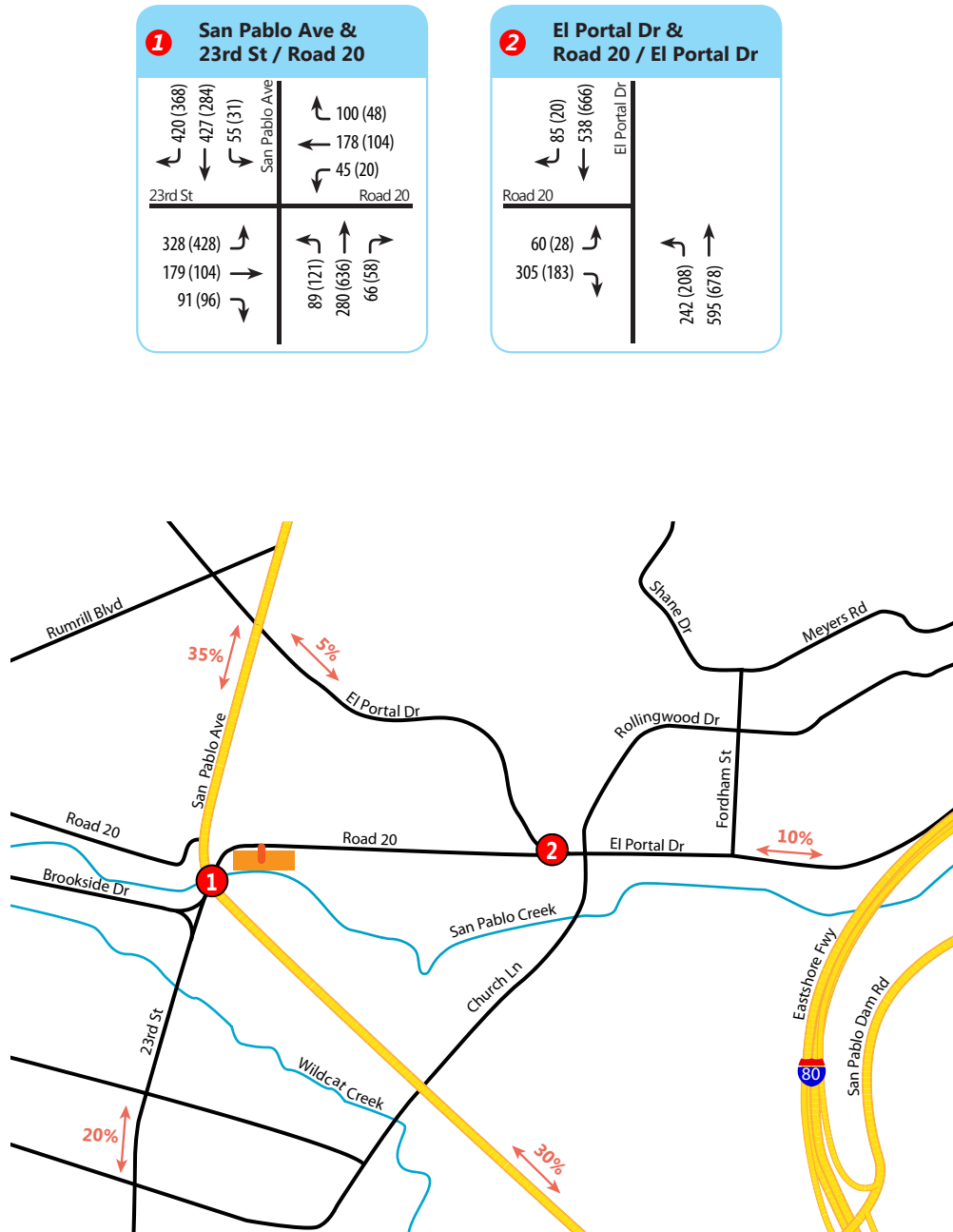
**Table 6: Intersection Level of Service Analysis – Existing plus Project Conditions**

| # | Study Intersections                              | Control | Peak Hour <sup>1</sup> | Existing Conditions |                  | Existing Plus Project Conditions |                  | Change in Delay | Significant? |
|---|--------------------------------------------------|---------|------------------------|---------------------|------------------|----------------------------------|------------------|-----------------|--------------|
|   |                                                  |         |                        | Delay <sup>2</sup>  | LOS <sup>3</sup> | Delay <sup>2</sup>               | LOS <sup>3</sup> |                 |              |
| 1 | San Pablo Avenue/Road 20-23 <sup>rd</sup> Street | Signal  | A.M.                   | 53.2                | D                | 53.9                             | D                | 0.7             | N            |
|   |                                                  |         | P.M.                   | 47.1                | D                | 48.2                             | D                | 1.1             | N            |
| 2 | El Portal Drive/Road 20                          | Signal  | A.M.                   | 11.9                | B                | 11.9                             | B                | 0.0             | N            |
|   |                                                  |         | P.M.                   | 8.2                 | A                | 8.3                              | A                | 0.1             | N            |

Notes:

1. AM – morning peak hour, PM – evening peak hour
2. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections.
3. LOS – Level of Service.

Figure 7: Existing plus Project Peak Hour Traffic Volumes



## LEGEND

- Project Site
- Study Intersection
- Project Access
- XX AM Peak Hour Traffic Volumes
- (XX) PM Peak Hour Traffic Volumes
- XX% Trip Distribution



#### 4.4 QUEUING ANALYSIS – EXISTING PLUS PROJECT CONDITIONS

TJKM conducted a vehicle queueing and storage analysis for exclusive left and right turn pockets at the study intersections where project traffic is added under Existing plus Project Conditions. The 95<sup>th</sup> percentile queues were analyzed using Synchro 10.0 software. Detailed calculations are included in the LOS appendices corresponding to each analysis scenario. **Table 7** summarizes the 95<sup>th</sup> percentile queue lengths at selected study intersections under Existing and Existing plus Project scenarios. It should be noted that queue lengths at some locations already exceed capacity, creating deficient conditions.

**Table 7: 95<sup>th</sup> Percentile Queues at Study Intersections**

| # | Study Intersections                              | Lane Group | Storage Length | Existing   |            | Existing Plus Project Conditions |            | Change |    |
|---|--------------------------------------------------|------------|----------------|------------|------------|----------------------------------|------------|--------|----|
|   |                                                  |            |                | AM         | PM         | AM                               | PM         | AM     | PM |
| 1 | San Pablo Avenue/Road 20-23 <sup>rd</sup> Street | EBL        | 325            | <b>525</b> | <b>490</b> | <b>525</b>                       | <b>505</b> | 0      | 15 |
|   |                                                  | EBTL       | 325            | <b>535</b> | <b>500</b> | <b>540</b>                       | <b>505</b> | 5      | 5  |
|   |                                                  | EBR        | 135            | 20         | 25         | 20                               | 25         | 0      | 0  |
|   |                                                  | WBTL       | 70             | <b>440</b> | <b>245</b> | <b>460</b>                       | <b>255</b> | 20     | 10 |
|   |                                                  | WBR        | 70             | 20         | 0          | 35                               | 0          | 15     | 0  |
|   |                                                  | NBL        | 155            | <b>220</b> | <b>285</b> | <b>220</b>                       | <b>290</b> | 0      | 5  |
|   |                                                  | NBTR       | 1,025          | 280        | 540        | 280                              | 550        | 0      | 10 |
|   |                                                  | SBL        | 90             | <b>175</b> | 75         | <b>185</b>                       | 90         | 10     | 15 |
|   |                                                  | SBT        | 90             | <b>370</b> | <b>225</b> | <b>370</b>                       | <b>230</b> | 0      | 5  |
|   |                                                  | SBR        | 90             | <b>405</b> | <b>280</b> | <b>405</b>                       | <b>285</b> | 0      | 5  |
| 2 | El Portal Drive/Road 20                          | EBL        | 170            | 40         | 30         | 45                               | 30         | 5      | 0  |
|   |                                                  | EBR        | 300            | 0          | 0          | 0                                | 0          | 0      | 0  |
|   |                                                  | NBL        | 155            | <b>235</b> | <b>190</b> | <b>235</b>                       | <b>190</b> | 0      | 0  |
|   |                                                  | NBT        | 350            | 115        | 135        | 115                              | 135        | 0      | 0  |
|   |                                                  | SBT        | 445            | 160        | 240        | 160                              | 240        | 0      | 0  |
|   |                                                  | SBR        | 45             | 40         | 20         | 40                               | 20         | 0      | 0  |

Notes: Storage length and 95th percentile queue is expressed in feet per lane

AM – morning peak hour, PM – evening peak hour

1 vehicle = 25 feet

**Bold** indicates queue lengths exceeding capacity

The following are movements where the addition of project trips would exceed existing storage or further increase the queue lengths that already exceed existing storage lengths:

- Eastbound left-turn lane at San Pablo Avenue/Road 20-23<sup>rd</sup> Street: the proposed project would further increase the already exceeding exiting queue length by less than one vehicle (1 vehicle = 25 ft.) during the p.m. peak only. Improvements to this intersection have been identified in the *Update of the Contra Costa Congestion Management Program* (CCTA, 2019) that include widening the intersection to accommodate additional eastbound left-turn lanes. However, specific improvements to this approach have not been identified yet.

- Eastbound through-left lane at San Pablo Avenue/Road 20-23<sup>rd</sup> Street: the proposed project would further increase the already exceeding existing queue length by less than one (1 vehicle = 25 feet) during both peak periods.
- Westbound through-left lane at San Pablo Avenue/Road 20-23<sup>rd</sup> Street: the proposed project would further increase the already exceeding existing queue length by less than one vehicle (1 vehicle = 25 feet) during both peak periods.
- Northbound left-turn lane at San Pablo Avenue/Road 20-23<sup>rd</sup> Street: the proposed project would further increase the already exceeding existing queue length by less than one vehicle (1 vehicle = 25 feet) during the p.m. peak period only.
- Southbound left-turn lane at San Pablo Avenue/Road 20-23<sup>rd</sup> Street: the proposed project would further increase the already exceeding existing queue length by less than one vehicle (1 vehicle = 25 feet) during the a.m. peak period only.
- Southbound through lane at San Pablo Avenue/Road 20-23<sup>rd</sup> Street: the proposed project would further increase the already exceeding existing queue length by less than one vehicle (1 vehicle = 25 ft.) during the p.m. peak only.
- Southbound right-turn lane at San Pablo Avenue/Road 20-23<sup>rd</sup> Street: the proposed project would further increase the already exceeding existing queue length by less than one vehicle (1 vehicle = 25 ft.) during the p.m. peak only.

#### 4.5 QUEUING ANALYSIS AT PROJECT DRIVEWAY

TJKM conducted a vehicle queuing analysis at the project driveway along Road 20. The 95<sup>th</sup> percentile (maximum) queues were analyzed using the HCM 2000 Queue methodology contained in Synchro 10 software for the project driveways. **Table 8** summarizes the 95<sup>th</sup> percentile queue lengths at the project driveway under Existing plus Project scenario. As shown in **Table 8**, under Existing plus Project Conditions the 95<sup>th</sup> percentile queues at the outbound approach of project driveway are expected to be minimal.

**Table 8: 95<sup>th</sup> Percentile Queues at Project Driveways**

| Intersection              | Control      | Existing plus Project Conditions |                                                     |     |                                                     |
|---------------------------|--------------|----------------------------------|-----------------------------------------------------|-----|-----------------------------------------------------|
|                           |              | AM                               |                                                     | PM  |                                                     |
|                           |              | LOS                              | 95 <sup>th</sup> Percentile Queue (ft) <sup>1</sup> | LOS | 95 <sup>th</sup> Percentile Queue (ft) <sup>1</sup> |
| Road 20/ Project Driveway | One-Way Stop | B                                | 25                                                  | B   | 25                                                  |

Notes:

1 vehicle=25 feet

<sup>1</sup>Reported values of 95<sup>th</sup> percentile queues are for the outbound movements at the project driveways

## 5.0 ADDITIONAL ANALYSES

The following sections provide additional analyses of other transportation issues associated with the project site, including:

- Site Access and Onsite Circulation;
- Pedestrian, Bicycle, and Transit Impacts
- Vehicle Miles Traveled (VMT) Analysis

Unlike the LOS impact methodology, the analyses in these sections is based on professional judgment in accordance with the standards and methods employed by traffic engineers. Although operational issues are not considered CEQA impacts, they do describe traffic conditions that are relevant to the project environment.

### 5.1 SITE ACCESS AND ON-SITE CIRCULATION

#### Site Access

The proposed vehicular access to the project site is via one project entrance on Road 20. Main driveway access is to the proposed parking garage. From the site plan, it appears that existing sidewalks and on-street parking along the project frontage will be maintained. The posted speed limit along the project frontage is 30 mph, requiring a stopping sight distance of 200 feet. Sight distance between vehicles travelling westbound on Road 20 and vehicles exiting the project site is clear and visible for at least 200 feet; however, sight distance between vehicles travelling eastbound on Road 20 and vehicles exiting the project site is slightly obstructed by the horizontal curvature of Road 20, west of the project site. TJKM recommends the project use landscaping below eye level to avoid further obstructing sight distance west of the project site.

#### On-Site Circulation

In terms of external access, the project site plan (**Figure 2**) shows that the proposed project would provide access via one bidirectional driveway. The driveway does not have any turning restrictions and appears to accommodate two-way travel. Based on the current site plan, circulation aisles seem to satisfy the minimum 22 feet requirement from the City of San Pablo Municipal Code.

The proposed project proposes to provide a single level of parking garage space with one two-way circulation aisle. The southern side of the parking garage features surface level parking and the northern side of the garage features three-level parking lifts. The proposed project should perform a truck turning analysis to confirm a variety of trucks, including garbage trucks and emergency vehicles, can circulate on-site. Based on a preliminary review of the project site plan, the site access and on-site circulation is considered adequate. Garbage trucks can access the project site via the parking access driveway between the garage and accessible parking lot. Emergency vehicles may access the project site via the parking access driveway between the garage and accessible parking lot or the on-street parking along the project frontage.

## 5.2 PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS

### Pedestrian Access

Pedestrian access to the project site will be facilitated by existing sidewalks along Road 20, San Pablo Avenue, 23<sup>rd</sup> Street and El Portal Drive. Additionally, a Class I shared use path called the Wildcat Creek Trail can be accessed via 23<sup>rd</sup> Street, located 0.2 miles southwest of the project site. Based on the project site plan, the project proposes to maintain the existing sidewalk adjacent to the project site. There is existing street lighting that is adequate along Road 20. However, the project should provide street lighting at the project driveway to increase pedestrian visibility. The proposed project does not conflict with existing and planned pedestrian facilities; therefore, the impact to pedestrian facilities is **less than significant**.

### Bicycle Access

In terms of bicycle access to the project site, there are currently Class II bicycle facilities along 23<sup>rd</sup> Street, and El Portal Drive. Additionally, the Wildcat Creek Trail, a Class I shared use path, is accessible on 23<sup>rd</sup> Street, located 0.2 miles southwest of the project site. There are no bicycle facilities that provide direct access to the project site. The project does not conflict with existing and planned bicycle facilities; therefore, the impact to bicycle facilities is **less than significant**.

### Transit Access

AC Transit bus stops exist on Road 20, San Pablo Avenue, El Portal Drive and 23<sup>rd</sup> Street within the project vicinity. The project site is within a quarter mile of the San Pablo Avenue and Purisima Street, and Road 20 at Abella Circle AC Transit bus stops. AC Transit can connect riders locally to Richmond and Hilltop Mall. The existing pedestrian facilities in the project vicinity provide adequate connectivity for pedestrians to the transit stops. Impacts to transit service are expected to be **less than significant**.

## 5.4 VEHICLES MILES TRAVELED (VMT)

The Governor's Office of Planning and Research (OPR) *Technical Advisory* (December 2018) provides guidance to analysts and local jurisdictions for implementing VMT as a metric for determining the transportation impact for land use projects. The OPR guidelines state that for analysis purposes, "VMT" refers to automobile VMT, specifically passenger vehicles and light trucks. Heavy truck traffic is typically excluded. The Contra Costa County *Transportation Analysis Guidelines* (June 2020) provide additional guidance on evaluating VMT impacts from projects within the County.

Both the OPR and County guidelines provide standards for identifying which projects should be exempt from further VMT analysis, based on characteristics such as their size, proximity to transit, or expected number of total daily trips. **Table 9** summarizes the VMT screening criteria as outlined in the Transportation analysis Guidelines.

**Table 9: Contra Costa County VMT Screening Criteria**

| Type of Project                                           | Screening Criteria                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General                                                   | Generate or attract fewer than 110 daily vehicle trips; or<br>Projects of 10,000 square feet or less of non-residential space or 20 residential units or less, or<br>otherwise generating less than 836 VMT per day.                                                                                                                                            |
| Residential, retail,<br>office, or mixed-<br>use projects | Projects within ½ mile of an existing major transit stop or an existing stop along a high<br>quality transit corridor.                                                                                                                                                                                                                                          |
| Residential,<br>employment                                | Residential projects (home-based) at 15% or below the baseline County-wide home-based<br>average VMT per capita; or<br>Employment projects (employee VMT) at 15% or below the baseline Bay Area average<br>commute VMT per employee in areas with low VMT that incorporate similar VMT reducing<br>features (i.e. density, mix of uses, transit accessibility). |
| Public facilities<br>and government<br>buildings          | Public facilities (e.g. emergency services, passive parks (low-intensity recreation, open space),<br>libraries, community centers, public utilities) are exempt.                                                                                                                                                                                                |

Source: Contra Costa County Transportation Analysis Guidelines

The project is located in the city of San Pablo consists of 64 multi-family housing units on a site east of San Pablo near the downtown area. Currently, there is a small single family house on the site of the Project.

This project is exempt from VMT requirements per Contra Costa County Transportation Analysis Guidelines (6/23/2020, page 7) which states:

*There are five screening criteria that lead agencies can apply to screen projects out of conducting project-level VMT analysis. Even if a project satisfies one or more of the screening criteria, lead agencies may still require a VMT analysis if there is evidence that the project has characteristics that might lead to a significant amount of VMT.*

*2.1: CEQA Exemption. Any project that is exempt from CEQA is not required to conduct a VMT analysis.*

This project can claim CEQA exemption #15332, as stated below:

**15332. IN-FILL DEVELOPMENT PROJECTS**

*Class 32 consists of projects characterized as in-fill development meeting the conditions described in this section:*

- A. The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations.*
- B. The proposed development occurs within city limits on a project site of no more than five acres substantially surrounded by urban uses.*
- C. The project site has no value as habitat for endangered, rare or threatened species.*

- D. Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality.*
- E. The site can be adequately served by all required utilities and public services.*

*Note: Authority cited: Section 21083, Public Resources Code. Reference: Section 21084, Public Resources Code.*

Since this project is exempt from CEQA, in accordance to CCTA VMT requirements, it is also not required to conduct a VMT analysis.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

### ***Project Trip Generation***

The proposed project is expected to generate approximately 23 weekday a.m. peak hour trips (6 inbound trips, 17 outbound trips), and 29 weekday p.m. peak hour trips (18 inbound trips, 11 outbound trips).

### ***Existing Conditions***

Under this scenario, all of the study intersections operate within applicable jurisdictional LOS standards of LOS D or better during both peak hours.

### ***Existing plus Project Conditions***

Under this scenario, all of the study intersections continue to operate within applicable jurisdictional LOS standards of LOS D or better during both peak hours.

### ***Queueing Analysis***

The following are movements where the addition of project trips would further increase the queue lengths that already exceed existing storage lengths:

- San Pablo Avenue/Road 20-23<sup>rd</sup> Street
  - ✓ Eastbound left-turn lane during the p.m. peak hour only. Eastbound through-left lane during both peak hours.
  - ✓ Westbound through-left lane during both peak hours.
  - ✓ Northbound left-turn lane during the p.m. peak hour only.
  - ✓ Southbound left-turn lane during the a.m. peak hour only. Southbound through lane during the p.m. peak hour only. Southbound right-turn lane during the p.m. peak hour only.

### ***Site Access and On-Site Circulation***

The proposed vehicular access to the project site is via one project entrance on Road 20. Main driveway access is to the proposed parking garage. From the site plan, it appears that existing sidewalks and on-street parking along the project frontage will be maintained. Sight distance between vehicles travelling westbound on Road 20 and vehicles exiting the project site is clear and visible for at least 200 feet; however, sight distance between vehicles travelling eastbound on Road 20 and vehicles exiting the project site is slightly obstructed by the horizontal curvature of Road 20, west of the project site. TJKM recommends the project use landscaping below eye level to avoid further obstructing sight distance west of the project site.

Based on the current site plan, circulation aisles seem to satisfy the minimum 22 feet requirement from the City of San Pablo Municipal Code. The proposed project should perform a truck turning analysis to confirm a variety of trucks, including garbage trucks and emergency vehicles, can circulate on-site. Based on a preliminary review of the project site plan, the site access and on-site circulation is considered adequate.

***Pedestrian Impacts***

The proposed project should provide adequate street lighting at the project driveway. The proposed project does not conflict with existing and planned pedestrian facilities; therefore, the impact to pedestrian facilities is ***less than significant***.

***Bicycle Impacts***

The project is does not conflict with existing and planned bicycle facilities; therefore, the impact to bicycle facilities is ***less than significant***.

***Transit Impacts***

The project site is within walking distance to various AC Transit bus stops on Road 20 and San Pablo Avenue. Impacts to transit service are expected to be ***less than significant***.

***Vehicle Miles Traveled***

Since the proposed project is exempt from CEQA (CEQA exemption #15332), in accordance to CCTA VMT requirements, it is also not required to conduct a VMT analysis.

## Appendix A – Existing Traffic Counts

| AM PEAK HOUR TRAFFIC VOLUMES |                                      |     |     |     |     |     |     |     |     |     |     |     |     |
|------------------------------|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| #                            | Intersection                         | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 1                            | San Pablo Avenue/Road 20-23rd Street | 89  | 280 | 64  | 53  | 427 | 420 | 328 | 178 | 91  | 40  | 175 | 94  |
| 2                            | El Portal Drive/Road 20              | 241 | 595 | 0   | 0   | 538 | 85  | 59  | 0   | 303 | 1   | 0   | 2   |
| PM PEAK HOUR TRAFFIC VOLUMES |                                      |     |     |     |     |     |     |     |     |     |     |     |     |
| #                            | Intersection                         | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 1                            | San Pablo Avenue/Road 20-23rd Street | 121 | 636 | 53  | 25  | 284 | 368 | 428 | 100 | 96  | 17  | 102 | 44  |
| 2                            | El Portal Drive/Road 20              | 206 | 678 | 0   | 0   | 666 | 19  | 27  | 0   | 182 | 0   | 0   | 1   |



## Two-Hour Count Summaries

| Interval Start |     | Rd 20     |    |    |    |     | Rd 20     |    |     |    |     | San Pablo Ave |     |    |     |    | San Pablo Ave |    |     |     |    | 23rd St        |    |     |     |     | 15-min Total | Rolling One Hour |
|----------------|-----|-----------|----|----|----|-----|-----------|----|-----|----|-----|---------------|-----|----|-----|----|---------------|----|-----|-----|----|----------------|----|-----|-----|-----|--------------|------------------|
|                |     | Eastbound |    |    |    |     | Westbound |    |     |    |     | Northbound    |     |    |     |    | Southbound    |    |     |     |    | Northeastbound |    |     |     |     |              |                  |
|                |     | UT        | LT | TH | RT | HR  | UT        | LT | BL  | TH | RT  | UT            | HL  | LT | TH  | RT | UT            | LT | TH  | BR  | RT | UT             | HL | BL  | BR  | HR  |              |                  |
| 7:00 AM        |     | 0         | 1  | 1  | 5  | 5   | 0         | 1  | 9   | 0  | 7   | 0             | 13  | 0  | 28  | 2  | 0             | 2  | 53  | 36  | 1  | 0              | 0  | 36  | 13  | 14  | 227          | 0                |
| 7:15 AM        |     | 0         | 0  | 3  | 8  | 8   | 0         | 6  | 24  | 0  | 5   | 0             | 7   | 0  | 32  | 5  | 0             | 3  | 76  | 57  | 0  | 0              | 0  | 42  | 12  | 14  | 302          | 0                |
| 7:30 AM        |     | 0         | 0  | 1  | 9  | 5   | 0         | 6  | 16  | 0  | 10  | 0             | 12  | 0  | 40  | 6  | 0             | 6  | 109 | 65  | 5  | 0              | 0  | 64  | 13  | 15  | 382          | 0                |
| 7:45 AM        |     | 0         | 1  | 2  | 11 | 7   | 0         | 3  | 20  | 0  | 11  | 0             | 20  | 0  | 71  | 8  | 0             | 4  | 131 | 83  | 2  | 0              | 0  | 111 | 21  | 14  | 520          | 1,431            |
| 8:00 AM        |     | 0         | 0  | 3  | 7  | 5   | 0         | 8  | 27  | 0  | 21  | 0             | 20  | 0  | 68  | 6  | 0             | 3  | 104 | 100 | 4  | 0              | 0  | 105 | 28  | 21  | 530          | 1,734            |
| 8:15 AM        |     | 0         | 1  | 3  | 4  | 4   | 0         | 10 | 23  | 0  | 18  | 0             | 16  | 0  | 44  | 9  | 1             | 11 | 112 | 120 | 5  | 0              | 0  | 72  | 35  | 28  | 516          | 1,948            |
| 8:30 AM        |     | 0         | 0  | 1  | 7  | 0   | 0         | 5  | 51  | 0  | 17  | 0             | 19  | 0  | 79  | 30 | 0             | 11 | 84  | 104 | 6  | 0              | 0  | 56  | 67  | 18  | 555          | 2,121            |
| 8:45 AM        |     | 0         | 0  | 2  | 9  | 1   | 0         | 14 | 61  | 0  | 31  | 0             | 27  | 0  | 68  | 14 | 0             | 23 | 95  | 65  | 8  | 0              | 0  | 71  | 35  | 17  | 541          | 2,142            |
| Count Total    |     | 0         | 3  | 16 | 60 | 35  | 0         | 53 | 231 | 0  | 120 | 0             | 134 | 0  | 430 | 80 | 1             | 63 | 764 | 630 | 31 | 0              | 0  | 557 | 224 | 141 | 3,573        | 0                |
| Peak Hour      | All | 0         | 1  | 9  | 27 | 10  | 0         | 37 | 162 | 0  | 87  | 0             | 82  | 0  | 259 | 59 | 1             | 48 | 395 | 389 | 23 | 0              | 0  | 304 | 165 | 84  | 2,142        | 0                |
|                | HV  | 0         | 0  | 0  | 0  | 1   | 0         | 0  | 4   | 0  | 3   | 0             | 3   | 0  | 8   | 0  | 0             | 2  | 15  | 5   | 0  | 0              | 0  | 6   | 0   | 3   | 50           | 0                |
|                | HV% | -         | 0% | 0% | 0% | 10% | -         | 0% | 2%  | -  | 3%  | -             | 4%  | -  | 3%  | 0% | 0%            | 4% | 4%  | 1%  | 0% | -              | -  | 2%  | 0%  | 4%  | 2%           | 0                |

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

| Interval Start | Heavy Vehicle Totals |    |    |    |     |       | Bicycles |    |    |    |     |       | Pedestrians (Crossing Leg) |      |       |       |           |       |
|----------------|----------------------|----|----|----|-----|-------|----------|----|----|----|-----|-------|----------------------------|------|-------|-------|-----------|-------|
|                | EB                   | WB | NB | SB | NEB | Total | EB       | WB | NB | SB | NEB | Total | East                       | West | North | South | Southwest | Total |
| 7:00 AM        | 0                    | 2  | 3  | 0  | 3   | 8     | 0        | 1  | 0  | 0  | 0   | 1     | 0                          | 1    | 0     | 1     | 0         | 2     |
| 7:15 AM        | 0                    | 2  | 3  | 10 | 3   | 18    | 0        | 0  | 1  | 0  | 0   | 1     | 2                          | 5    | 0     | 0     | 1         | 8     |
| 7:30 AM        | 0                    | 1  | 3  | 9  | 6   | 19    | 0        | 0  | 0  | 0  | 1   | 1     | 1                          | 3    | 1     | 0     | 1         | 6     |
| 7:45 AM        | 2                    | 1  | 4  | 9  | 3   | 19    | 0        | 0  | 0  | 0  | 0   | 0     | 5                          | 6    | 0     | 6     | 5         | 22    |
| 8:00 AM        | 0                    | 1  | 2  | 4  | 3   | 10    | 0        | 1  | 1  | 1  | 0   | 3     | 6                          | 9    | 0     | 11    | 3         | 29    |
| 8:15 AM        | 1                    | 3  | 2  | 5  | 1   | 12    | 0        | 0  | 0  | 0  | 0   | 0     | 3                          | 5    | 0     | 26    | 4         | 38    |
| 8:30 AM        | 0                    | 2  | 1  | 2  | 2   | 7     | 0        | 0  | 0  | 0  | 0   | 0     | 4                          | 2    | 4     | 25    | 12        | 47    |
| 8:45 AM        | 0                    | 1  | 6  | 11 | 3   | 21    | 0        | 0  | 0  | 0  | 0   | 0     | 6                          | 3    | 0     | 15    | 3         | 27    |
| Count Total    | 3                    | 13 | 24 | 50 | 24  | 114   | 0        | 2  | 2  | 1  | 1   | 6     | 27                         | 34   | 5     | 84    | 29        | 179   |
| Peak Hr        | 1                    | 7  | 11 | 22 | 9   | 50    | 0        | 1  | 1  | 1  | 0   | 3     | 19                         | 19   | 4     | 77    | 22        | 141   |

## Two-Hour Count Summaries - Heavy Vehicles

| Interval Start | Rd 20<br>Eastbound |    |    |    |    | Rd 20<br>Westbound |    |    |    |    | San Pablo Ave<br>Northbound |    |    |    |    | San Pablo Ave<br>Southbound |    |    |    |    | 23rd St<br>Northeastbound |    |    |    |    | 15-min<br>Total | Rolling<br>One<br>Hour |
|----------------|--------------------|----|----|----|----|--------------------|----|----|----|----|-----------------------------|----|----|----|----|-----------------------------|----|----|----|----|---------------------------|----|----|----|----|-----------------|------------------------|
|                | UT                 | LT | TH | RT | HR | UT                 | LT | BL | TH | RT | UT                          | HL | LT | TH | RT | UT                          | LT | TH | BR | RT | UT                        | HL | BL | BR | HR |                 |                        |
| 7:00 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 1  | 0  | 1  | 0                           | 2  | 0  | 1  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 1  | 1  | 1  | 8               | 0                      |
| 7:15 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 1  | 0  | 1  | 0                           | 0  | 0  | 3  | 0  | 0                           | 2  | 4  | 4  | 0  | 0                         | 0  | 2  | 1  | 0  | 18              | 0                      |
| 7:30 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 1  | 0  | 0  | 0                           | 2  | 0  | 1  | 0  | 0                           | 1  | 4  | 4  | 0  | 0                         | 0  | 4  | 1  | 1  | 19              | 0                      |
| 7:45 AM        | 0                  | 0  | 0  | 2  | 0  | 0                  | 0  | 0  | 0  | 1  | 0                           | 0  | 0  | 4  | 0  | 0                           | 1  | 5  | 3  | 0  | 0                         | 0  | 3  | 0  | 0  | 19              | 64                     |
| 8:00 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 1  | 0  | 0  | 0                           | 0  | 0  | 2  | 0  | 0                           | 0  | 3  | 1  | 0  | 0                         | 0  | 2  | 0  | 1  | 10              | 66                     |
| 8:15 AM        | 0                  | 0  | 0  | 0  | 1  | 0                  | 0  | 1  | 0  | 2  | 0                           | 1  | 0  | 1  | 0  | 0                           | 1  | 3  | 1  | 0  | 0                         | 0  | 0  | 0  | 1  | 12              | 60                     |
| 8:30 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 2  | 0  | 0  | 0                           | 0  | 0  | 1  | 0  | 0                           | 0  | 1  | 1  | 0  | 0                         | 0  | 2  | 0  | 0  | 7               | 48                     |
| 8:45 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 1  | 0                           | 2  | 0  | 4  | 0  | 0                           | 1  | 8  | 2  | 0  | 0                         | 0  | 2  | 0  | 1  | 21              | 50                     |
| Count Total    | 0                  | 0  | 0  | 2  | 1  | 0                  | 0  | 7  | 0  | 6  | 0                           | 7  | 0  | 17 | 0  | 0                           | 6  | 28 | 16 | 0  | 0                         | 0  | 16 | 3  | 5  | 114             | 0                      |
| Peak Hour      | 0                  | 0  | 0  | 0  | 1  | 0                  | 0  | 4  | 0  | 3  | 0                           | 3  | 0  | 8  | 0  | 0                           | 2  | 15 | 5  | 0  | 0                         | 0  | 6  | 0  | 3  | 50              | 0                      |

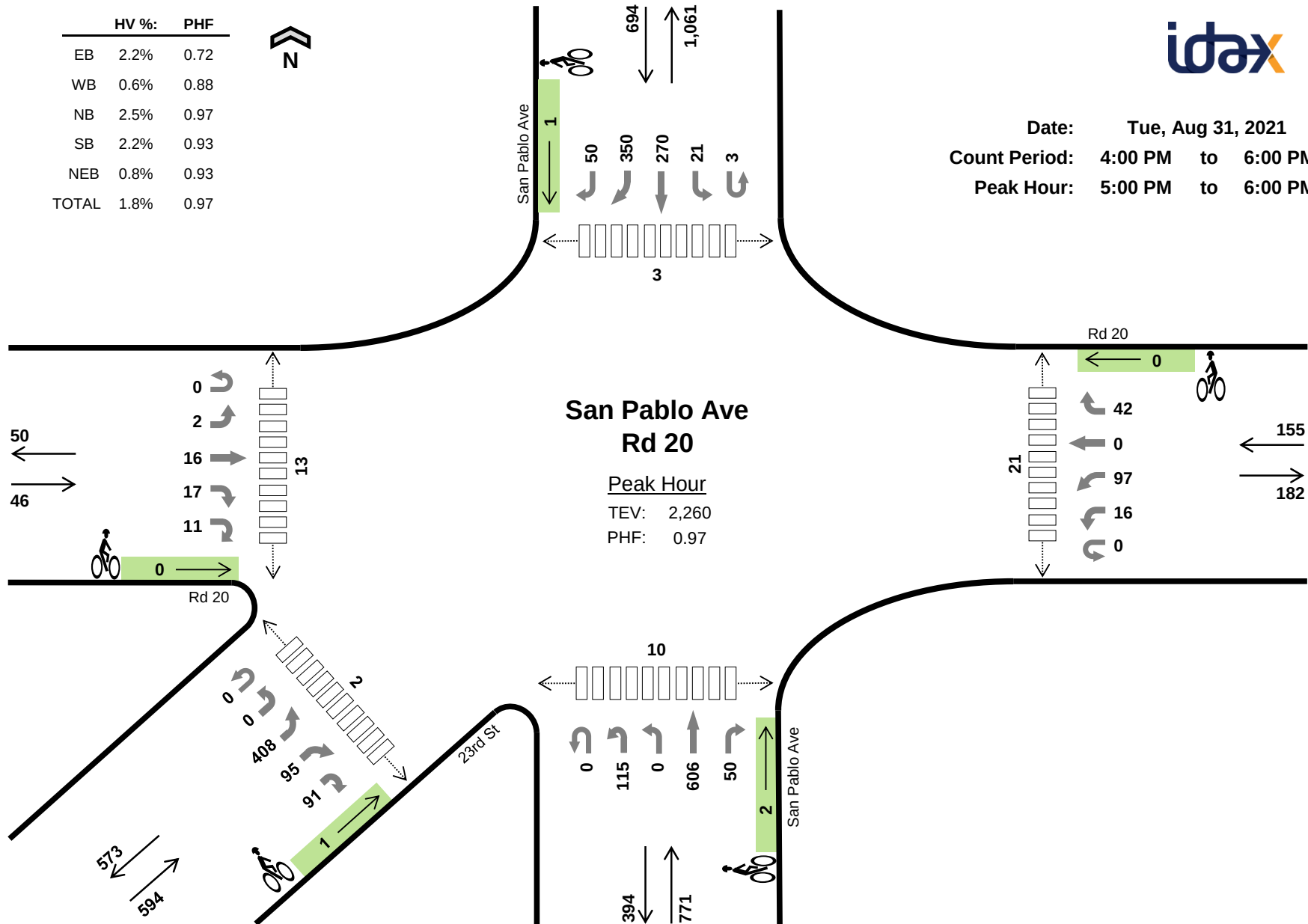
## Two-Hour Count Summaries - Bikes

| Interval Start | Rd 20<br>Eastbound |    |    |    |    | Rd 20<br>Westbound |    |    |    |    | San Pablo Ave<br>Northbound |    |    |    |    | San Pablo Ave<br>Southbound |    |    |    |    | 23rd St<br>Northeastbound |    |    |    |    | 15-min<br>Total | Rolling<br>One<br>Hour |
|----------------|--------------------|----|----|----|----|--------------------|----|----|----|----|-----------------------------|----|----|----|----|-----------------------------|----|----|----|----|---------------------------|----|----|----|----|-----------------|------------------------|
|                | UT                 | LT | TH | RT | HR | UT                 | LT | BL | TH | RT | UT                          | HL | LT | TH | RT | UT                          | LT | TH | BR | RT | UT                        | HL | BL | BR | HR |                 |                        |
| 7:00 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 1  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 1               | 0                      |
| 7:15 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 1  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 1               | 0                      |
| 7:30 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 1  | 0  | 0  | 1               | 0                      |
| 7:45 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 0               | 3                      |
| 8:00 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 1  | 0                           | 0  | 0  | 1  | 0  | 0                           | 0  | 0  | 0  | 1  | 0                         | 0  | 0  | 0  | 0  | 3               | 5                      |
| 8:15 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 0               | 4                      |
| 8:30 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 0               | 3                      |
| 8:45 AM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 0               | 3                      |
| Count Total    | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 1  | 0  | 1  | 0                           | 1  | 0  | 1  | 0  | 0                           | 0  | 0  | 0  | 1  | 0                         | 0  | 1  | 0  | 0  | 6               | 0                      |
| Peak Hour      | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 1  | 0                           | 0  | 0  | 1  | 0  | 0                           | 0  | 0  | 0  | 1  | 0                         | 0  | 0  | 0  | 0  | 3               | 0                      |



Date: Tue, Aug 31, 2021  
 Count Period: 4:00 PM to 6:00 PM  
 Peak Hour: 5:00 PM to 6:00 PM

|       | HV %: | PHF  |
|-------|-------|------|
| EB    | 2.2%  | 0.72 |
| WB    | 0.6%  | 0.88 |
| NB    | 2.5%  | 0.97 |
| SB    | 2.2%  | 0.93 |
| NEB   | 0.8%  | 0.93 |
| TOTAL | 1.8%  | 0.97 |



Two-Hour Count Summaries

| Interval Start |     | Rd 20     |    |    |    |    | Rd 20     |    |     |    |    | San Pablo Ave |     |    |       |    | San Pablo Ave |    |     |     |     | 23rd St        |    |     |     |     | 15-min Total | Rolling One Hour |
|----------------|-----|-----------|----|----|----|----|-----------|----|-----|----|----|---------------|-----|----|-------|----|---------------|----|-----|-----|-----|----------------|----|-----|-----|-----|--------------|------------------|
|                |     | Eastbound |    |    |    |    | Westbound |    |     |    |    | Northbound    |     |    |       |    | Southbound    |    |     |     |     | Northeastbound |    |     |     |     |              |                  |
|                |     | UT        | LT | TH | RT | HR | UT        | LT | BL  | TH | RT | UT            | HL  | LT | TH    | RT | UT            | LT | TH  | BR  | RT  | UT             | HL | BL  | BR  | HR  |              |                  |
| 4:00 PM        |     | 0         | 0  | 3  | 6  | 0  | 0         | 6  | 31  | 0  | 13 | 0             | 34  | 0  | 125   | 6  | 0             | 10 | 73  | 114 | 18  | 0              | 0  | 107 | 22  | 18  | 586          | 0                |
| 4:15 PM        |     | 0         | 1  | 1  | 9  | 0  | 0         | 4  | 20  | 0  | 16 | 0             | 38  | 0  | 140   | 4  | 1             | 7  | 78  | 97  | 8   | 0              | 0  | 78  | 13  | 16  | 531          | 0                |
| 4:30 PM        |     | 0         | 0  | 2  | 4  | 1  | 0         | 2  | 18  | 0  | 12 | 0             | 28  | 0  | 159   | 7  | 0             | 5  | 63  | 78  | 14  | 0              | 0  | 122 | 13  | 25  | 553          | 0                |
| 4:45 PM        |     | 0         | 0  | 0  | 4  | 0  | 0         | 9  | 23  | 0  | 14 | 0             | 19  | 0  | 159   | 14 | 2             | 8  | 67  | 82  | 11  | 0              | 0  | 91  | 17  | 22  | 542          | 2,212            |
| 5:00 PM        |     | 0         | 1  | 3  | 6  | 1  | 0         | 4  | 28  | 0  | 12 | 0             | 28  | 0  | 140   | 12 | 1             | 5  | 68  | 79  | 13  | 0              | 0  | 107 | 22  | 30  | 560          | 2,186            |
| 5:15 PM        |     | 0         | 0  | 6  | 4  | 6  | 0         | 1  | 21  | 0  | 12 | 0             | 38  | 0  | 139   | 17 | 0             | 4  | 66  | 92  | 5   | 0              | 0  | 97  | 21  | 25  | 554          | 2,209            |
| 5:30 PM        |     | 0         | 1  | 2  | 5  | 2  | 0         | 7  | 19  | 0  | 10 | 0             | 25  | 0  | 166   | 7  | 0             | 7  | 64  | 88  | 15  | 0              | 0  | 99  | 29  | 17  | 563          | 2,219            |
| 5:45 PM        |     | 0         | 0  | 5  | 2  | 2  | 0         | 4  | 29  | 0  | 8  | 0             | 24  | 0  | 161   | 14 | 2             | 5  | 72  | 91  | 17  | 0              | 0  | 105 | 23  | 19  | 583          | 2,260            |
| Count Total    |     | 0         | 3  | 22 | 40 | 12 | 0         | 37 | 189 | 0  | 97 | 0             | 234 | 0  | 1,189 | 81 | 6             | 51 | 551 | 721 | 101 | 0              | 0  | 806 | 160 | 172 | 4,472        | 0                |
| Peak Hour      | All | 0         | 2  | 16 | 17 | 11 | 0         | 16 | 97  | 0  | 42 | 0             | 115 | 0  | 606   | 50 | 3             | 21 | 270 | 350 | 50  | 0              | 0  | 408 | 95  | 91  | 2,260        | 0                |
|                | HV  | 0         | 0  | 0  | 1  | 0  | 0         | 0  | 1   | 0  | 0  | 0             | 3   | 0  | 14    | 2  | 0             | 1  | 7   | 5   | 2   | 0              | 0  | 5   | 0   | 0   | 41           | 0                |
|                | HV% | -         | 0% | 0% | 6% | 0% | -         | 0% | 1%  | -  | 0% | -             | 3%  | -  | 2%    | 4% | 0%            | 5% | 3%  | 1%  | 4%  | -              | -  | 1%  | 0%  | 0%  | 2%           | 0                |

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

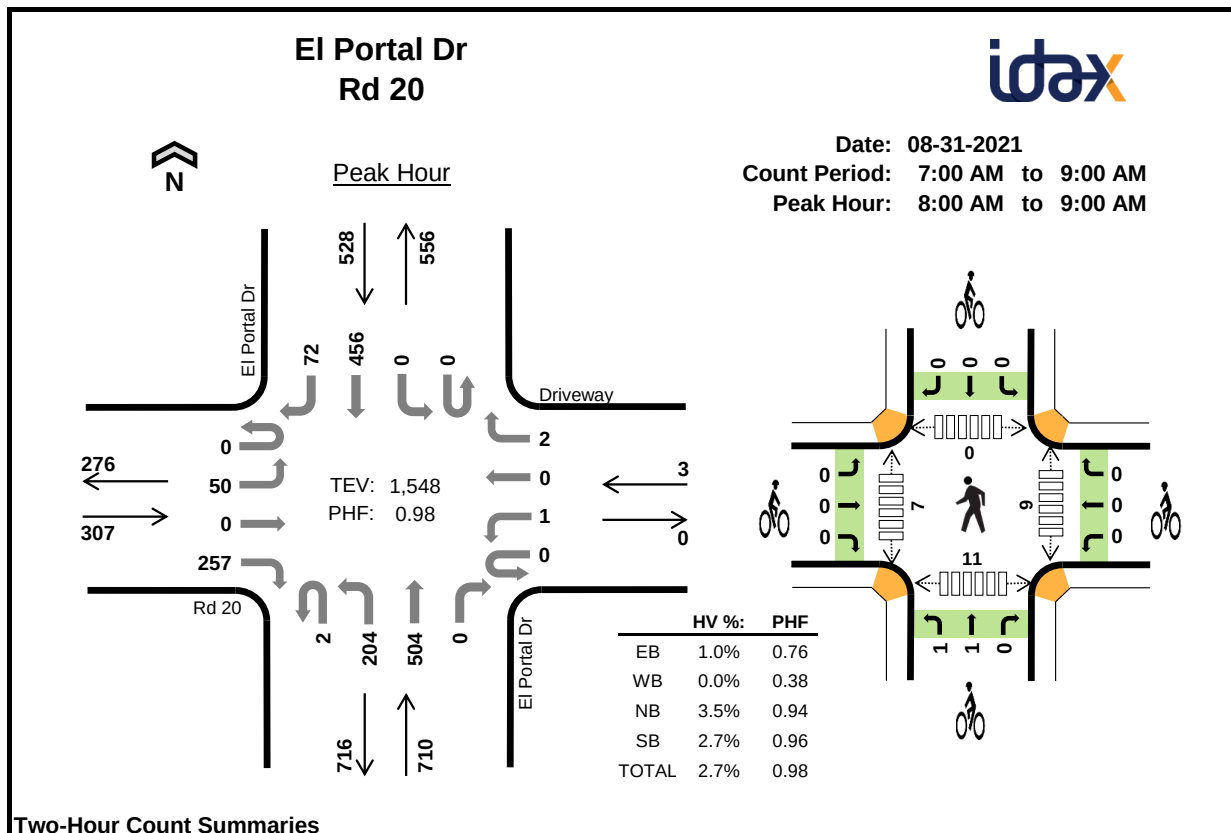
| Interval Start | Heavy Vehicle Totals |    |    |    |     |       | Bicycles |    |    |    |     |       | Pedestrians (Crossing Leg) |      |       |       |           |       |
|----------------|----------------------|----|----|----|-----|-------|----------|----|----|----|-----|-------|----------------------------|------|-------|-------|-----------|-------|
|                | EB                   | WB | NB | SB | NEB | Total | EB       | WB | NB | SB | NEB | Total | East                       | West | North | South | Southwest | Total |
| 4:00 PM        | 0                    | 1  | 9  | 7  | 2   | 19    | 0        | 0  | 0  | 2  | 0   | 2     | 1                          | 8    | 0     | 5     | 2         | 16    |
| 4:15 PM        | 0                    | 0  | 2  | 8  | 1   | 11    | 0        | 0  | 0  | 0  | 0   | 0     | 4                          | 7    | 0     | 6     | 3         | 20    |
| 4:30 PM        | 0                    | 2  | 5  | 4  | 3   | 14    | 1        | 1  | 0  | 0  | 0   | 2     | 2                          | 4    | 0     | 4     | 5         | 15    |
| 4:45 PM        | 0                    | 0  | 3  | 4  | 0   | 7     | 0        | 0  | 1  | 0  | 0   | 1     | 3                          | 7    | 0     | 2     | 2         | 14    |
| 5:00 PM        | 0                    | 0  | 7  | 4  | 2   | 13    | 0        | 0  | 1  | 1  | 0   | 2     | 5                          | 5    | 0     | 1     | 1         | 12    |
| 5:15 PM        | 0                    | 0  | 4  | 4  | 0   | 8     | 0        | 0  | 0  | 0  | 0   | 0     | 4                          | 3    | 2     | 0     | 0         | 9     |
| 5:30 PM        | 1                    | 0  | 4  | 4  | 0   | 9     | 0        | 0  | 0  | 0  | 1   | 1     | 2                          | 3    | 1     | 3     | 1         | 10    |
| 5:45 PM        | 0                    | 1  | 4  | 3  | 3   | 11    | 0        | 0  | 1  | 0  | 0   | 1     | 10                         | 2    | 0     | 6     | 0         | 18    |
| Count Total    | 1                    | 4  | 38 | 38 | 11  | 92    | 1        | 1  | 3  | 3  | 1   | 9     | 31                         | 39   | 3     | 27    | 14        | 114   |
| Peak Hr        | 1                    | 1  | 19 | 15 | 5   | 41    | 0        | 0  | 2  | 1  | 1   | 4     | 21                         | 13   | 3     | 10    | 2         | 49    |

Two-Hour Count Summaries - Heavy Vehicles

| Interval Start | Rd 20<br>Eastbound |    |    |    |    | Rd 20<br>Westbound |    |    |    |    | San Pablo Ave<br>Northbound |    |    |    |    | San Pablo Ave<br>Southbound |    |    |    |    | 23rd St<br>Northeastbound |    |    |    |    | 15-min<br>Total | Rolling<br>One<br>Hour |
|----------------|--------------------|----|----|----|----|--------------------|----|----|----|----|-----------------------------|----|----|----|----|-----------------------------|----|----|----|----|---------------------------|----|----|----|----|-----------------|------------------------|
|                | UT                 | LT | TH | RT | HR | UT                 | LT | BL | TH | RT | UT                          | HL | LT | TH | RT | UT                          | LT | TH | BR | RT | UT                        | HL | BL | BR | HR |                 |                        |
| 4:00 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 1  | 0  | 0  | 0                           | 3  | 0  | 6  | 0  | 0                           | 1  | 2  | 4  | 0  | 0                         | 0  | 2  | 0  | 0  | 19              | 0                      |
| 4:15 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 1  | 1  | 0                           | 1  | 4  | 3  | 0  | 0                         | 0  | 1  | 0  | 0  | 11              | 0                      |
| 4:30 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 2  | 0                           | 1  | 0  | 4  | 0  | 0                           | 0  | 3  | 1  | 0  | 0                         | 0  | 3  | 0  | 0  | 14              | 0                      |
| 4:45 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 2  | 0  | 1  | 0  | 0                           | 1  | 2  | 1  | 0  | 0                         | 0  | 0  | 0  | 0  | 7               | 51                     |
| 5:00 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 1  | 0  | 6  | 0  | 0                           | 0  | 2  | 2  | 0  | 0                         | 0  | 2  | 0  | 0  | 13              | 45                     |
| 5:15 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 3  | 1  | 0                           | 1  | 3  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 8               | 42                     |
| 5:30 PM        | 0                  | 0  | 0  | 1  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 3  | 1  | 0                           | 0  | 2  | 1  | 1  | 0                         | 0  | 0  | 0  | 0  | 9               | 37                     |
| 5:45 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 1  | 0  | 0  | 0                           | 2  | 0  | 2  | 0  | 0                           | 0  | 0  | 2  | 1  | 0                         | 0  | 3  | 0  | 0  | 11              | 41                     |
| Count Total    | 0                  | 0  | 0  | 1  | 0  | 0                  | 0  | 2  | 0  | 2  | 0                           | 9  | 0  | 26 | 3  | 0                           | 4  | 18 | 14 | 2  | 0                         | 0  | 11 | 0  | 0  | 92              | 0                      |
| Peak Hour      | 0                  | 0  | 0  | 1  | 0  | 0                  | 0  | 1  | 0  | 0  | 0                           | 3  | 0  | 14 | 2  | 0                           | 1  | 7  | 5  | 2  | 0                         | 0  | 5  | 0  | 0  | 41              | 0                      |

Two-Hour Count Summaries - Bikes

| Interval Start | Rd 20<br>Eastbound |    |    |    |    | Rd 20<br>Westbound |    |    |    |    | San Pablo Ave<br>Northbound |    |    |    |    | San Pablo Ave<br>Southbound |    |    |    |    | 23rd St<br>Northeastbound |    |    |    |    | 15-min<br>Total | Rolling<br>One<br>Hour |
|----------------|--------------------|----|----|----|----|--------------------|----|----|----|----|-----------------------------|----|----|----|----|-----------------------------|----|----|----|----|---------------------------|----|----|----|----|-----------------|------------------------|
|                | UT                 | LT | TH | RT | HR | UT                 | LT | BL | TH | RT | UT                          | HL | LT | TH | RT | UT                          | LT | TH | BR | RT | UT                        | HL | BL | BR | HR |                 |                        |
| 4:00 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 1  | 1  | 0                         | 0  | 0  | 0  | 0  | 2               | 0                      |
| 4:15 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 0               | 0                      |
| 4:30 PM        | 0                  | 0  | 1  | 0  | 0  | 0                  | 0  | 0  | 0  | 1  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 2               | 0                      |
| 4:45 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 1  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 1               | 5                      |
| 5:00 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 1  | 0  | 0                           | 0  | 1  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 2               | 5                      |
| 5:15 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 0               | 5                      |
| 5:30 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 1  | 0  | 1               | 4                      |
| 5:45 PM        | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 1  | 0  | 0                           | 0  | 0  | 0  | 0  | 0                         | 0  | 0  | 0  | 0  | 1               | 4                      |
| Count Total    | 0                  | 0  | 1  | 0  | 0  | 0                  | 0  | 0  | 0  | 1  | 0                           | 0  | 0  | 3  | 0  | 0                           | 0  | 1  | 1  | 1  | 0                         | 0  | 0  | 1  | 0  | 9               | 0                      |
| Peak Hour      | 0                  | 0  | 0  | 0  | 0  | 0                  | 0  | 0  | 0  | 0  | 0                           | 0  | 0  | 2  | 0  | 0                           | 0  | 1  | 0  | 0  | 0                         | 0  | 0  | 1  | 0  | 4               | 0                      |

**Two-Hour Count Summaries**

| Interval Start |     | Rd 20     |    |    |     | Driveway  |    |    |    | El Portal Dr |     |     |    | El Portal Dr |    |     |    | 15-min Total | Rolling One Hour |
|----------------|-----|-----------|----|----|-----|-----------|----|----|----|--------------|-----|-----|----|--------------|----|-----|----|--------------|------------------|
|                |     | Eastbound |    |    |     | Westbound |    |    |    | Northbound   |     |     |    | Southbound   |    |     |    |              |                  |
|                |     | UT        | LT | TH | RT  | UT        | LT | TH | RT | UT           | LT  | TH  | RT | UT           | LT | TH  | RT |              |                  |
| 7:00 AM        |     | 0         | 3  | 0  | 33  | 0         | 0  | 0  | 1  | 1            | 15  | 62  | 0  | 0            | 0  | 117 | 4  | 236          | 0                |
| 7:15 AM        |     | 0         | 2  | 0  | 41  | 0         | 0  | 0  | 1  | 0            | 23  | 58  | 0  | 0            | 0  | 105 | 1  | 231          | 0                |
| 7:30 AM        |     | 0         | 4  | 0  | 40  | 0         | 0  | 0  | 1  | 0            | 21  | 84  | 0  | 0            | 0  | 105 | 5  | 260          | 0                |
| 7:45 AM        |     | 0         | 6  | 0  | 60  | 0         | 0  | 0  | 1  | 0            | 22  | 84  | 0  | 0            | 0  | 115 | 11 | 299          | 1,026            |
| 8:00 AM        |     | 0         | 9  | 0  | 53  | 0         | 1  | 0  | 1  | 1            | 55  | 132 | 0  | 0            | 0  | 118 | 8  | 378          | 1,168            |
| 8:15 AM        |     | 0         | 15 | 0  | 58  | 0         | 0  | 0  | 0  | 0            | 49  | 124 | 0  | 0            | 0  | 121 | 17 | 384          | 1,321            |
| 8:30 AM        |     | 0         | 10 | 0  | 61  | 0         | 0  | 0  | 0  | 0            | 54  | 131 | 0  | 0            | 0  | 113 | 23 | 392          | 1,453            |
| 8:45 AM        |     | 0         | 16 | 0  | 85  | 0         | 0  | 0  | 1  | 1            | 46  | 117 | 0  | 0            | 0  | 104 | 24 | 394          | 1,548            |
| Count Total    |     | 0         | 65 | 0  | 431 | 0         | 1  | 0  | 6  | 3            | 285 | 792 | 0  | 0            | 0  | 898 | 93 | 2,574        | 0                |
| Peak Hour      | All | 0         | 50 | 0  | 257 | 0         | 1  | 0  | 2  | 2            | 204 | 504 | 0  | 0            | 0  | 456 | 72 | 1,548        | 0                |
|                | HV  | 0         | 0  | 0  | 3   | 0         | 0  | 0  | 0  | 0            | 6   | 19  | 0  | 0            | 0  | 13  | 1  | 42           | 0                |
|                | HV% | -         | 0% | -  | 1%  | -         | 0% | -  | 0% | 0%           | 3%  | 4%  | -  | -            | -  | 3%  | 1% | 3%           | 0                |

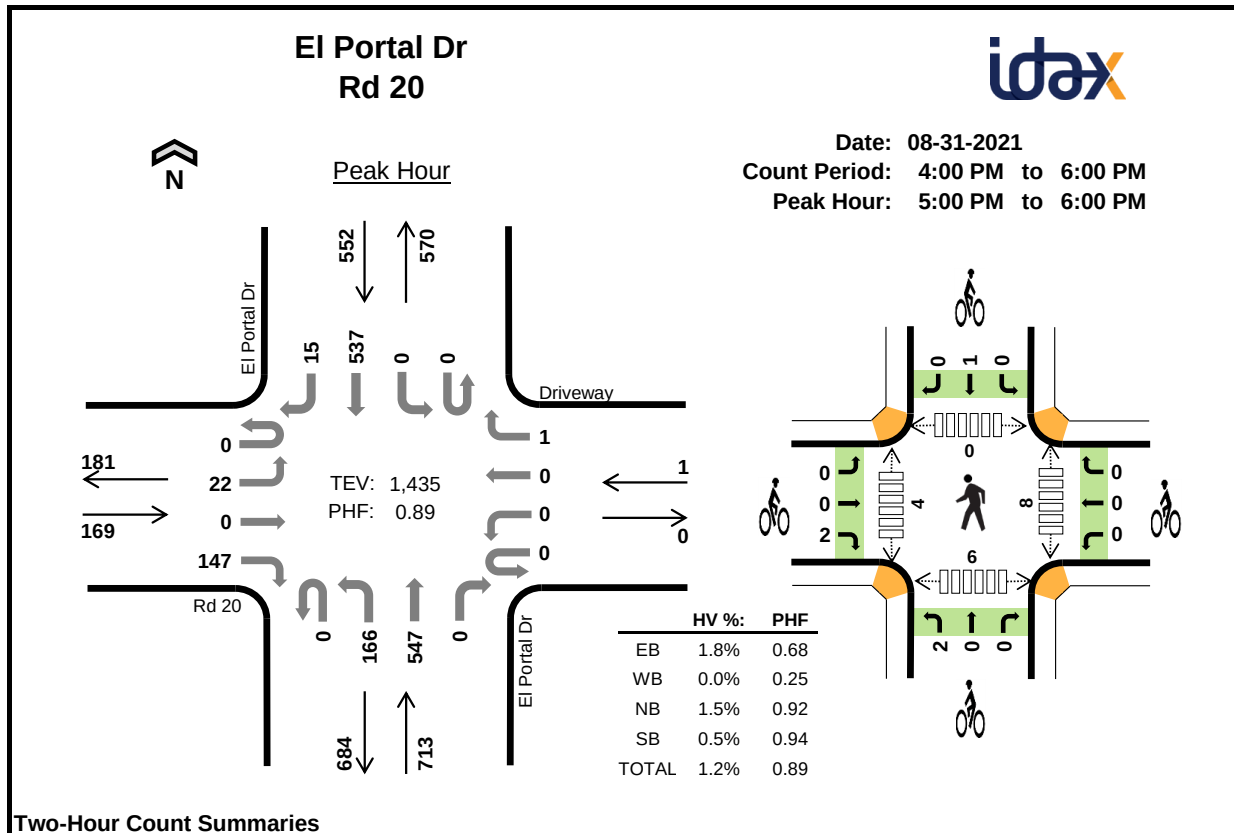
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

| Interval Start | Heavy Vehicle Totals |    |    |    |       | Bicycles |    |    |    |       | Pedestrians (Crossing Leg) |      |       |       |       |
|----------------|----------------------|----|----|----|-------|----------|----|----|----|-------|----------------------------|------|-------|-------|-------|
|                | EB                   | WB | NB | SB | Total | EB       | WB | NB | SB | Total | East                       | West | North | South | Total |
| 7:00 AM        | 4                    | 0  | 6  | 3  | 13    | 0        | 0  | 0  | 0  | 0     | 1                          | 0    | 0     | 1     | 2     |
| 7:15 AM        | 3                    | 0  | 5  | 6  | 14    | 0        | 0  | 1  | 0  | 1     | 0                          | 0    | 0     | 0     | 0     |
| 7:30 AM        | 1                    | 0  | 7  | 3  | 11    | 0        | 0  | 1  | 0  | 1     | 0                          | 1    | 0     | 0     | 1     |
| 7:45 AM        | 1                    | 0  | 5  | 9  | 15    | 0        | 0  | 1  | 0  | 1     | 0                          | 1    | 0     | 0     | 1     |
| 8:00 AM        | 0                    | 0  | 6  | 4  | 10    | 0        | 0  | 2  | 0  | 2     | 2                          | 0    | 0     | 2     | 4     |
| 8:15 AM        | 1                    | 0  | 5  | 3  | 9     | 0        | 0  | 0  | 0  | 0     | 1                          | 1    | 0     | 0     | 2     |
| 8:30 AM        | 0                    | 0  | 7  | 4  | 11    | 0        | 0  | 0  | 0  | 0     | 3                          | 5    | 0     | 4     | 12    |
| 8:45 AM        | 2                    | 0  | 7  | 3  | 12    | 0        | 0  | 0  | 0  | 0     | 3                          | 1    | 0     | 5     | 9     |
| Count Total    | 12                   | 0  | 48 | 35 | 95    | 0        | 0  | 5  | 0  | 5     | 10                         | 9    | 0     | 12    | 31    |
| Peak Hour      | 3                    | 0  | 25 | 14 | 42    | 0        | 0  | 2  | 0  | 2     | 9                          | 7    | 0     | 11    | 27    |

| Two-Hour Count Summaries - Heavy Vehicles |           |    |    |    |           |    |    |    |              |    |    |    |              |    |    |    |              |                  |
|-------------------------------------------|-----------|----|----|----|-----------|----|----|----|--------------|----|----|----|--------------|----|----|----|--------------|------------------|
| Interval Start                            | Rd 20     |    |    |    | Driveway  |    |    |    | El Portal Dr |    |    |    | El Portal Dr |    |    |    | 15-min Total | Rolling One Hour |
|                                           | Eastbound |    |    |    | Westbound |    |    |    | Northbound   |    |    |    | Southbound   |    |    |    |              |                  |
|                                           | UT        | LT | TH | RT | UT        | LT | TH | RT | UT           | LT | TH | RT | UT           | LT | TH | RT |              |                  |
| 7:00 AM                                   | 0         | 2  | 0  | 2  | 0         | 0  | 0  | 0  | 0            | 1  | 5  | 0  | 0            | 0  | 2  | 1  | 13           | 0                |
| 7:15 AM                                   | 0         | 0  | 0  | 3  | 0         | 0  | 0  | 0  | 0            | 1  | 4  | 0  | 0            | 0  | 6  | 0  | 14           | 0                |
| 7:30 AM                                   | 0         | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0            | 1  | 6  | 0  | 0            | 0  | 3  | 0  | 11           | 0                |
| 7:45 AM                                   | 0         | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0            | 1  | 4  | 0  | 0            | 0  | 8  | 1  | 15           | 53               |
| 8:00 AM                                   | 0         | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0            | 2  | 4  | 0  | 0            | 0  | 3  | 1  | 10           | 50               |
| 8:15 AM                                   | 0         | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0            | 2  | 3  | 0  | 0            | 0  | 3  | 0  | 9            | 45               |
| 8:30 AM                                   | 0         | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0            | 0  | 7  | 0  | 0            | 0  | 4  | 0  | 11           | 45               |
| 8:45 AM                                   | 0         | 0  | 0  | 2  | 0         | 0  | 0  | 0  | 0            | 2  | 5  | 0  | 0            | 0  | 3  | 0  | 12           | 42               |
| Count Total                               | 0         | 2  | 0  | 10 | 0         | 0  | 0  | 0  | 0            | 10 | 38 | 0  | 0            | 0  | 32 | 3  | 95           | 0                |
| Peak Hour                                 | 0         | 0  | 0  | 3  | 0         | 0  | 0  | 0  | 0            | 6  | 19 | 0  | 0            | 0  | 13 | 1  | 42           | 0                |

| Two-Hour Count Summaries - Bikes |           |    |    |           |    |    |              |    |    |              |    |    |              |                  |  |  |  |  |
|----------------------------------|-----------|----|----|-----------|----|----|--------------|----|----|--------------|----|----|--------------|------------------|--|--|--|--|
| Interval Start                   | Rd 20     |    |    | Driveway  |    |    | El Portal Dr |    |    | El Portal Dr |    |    | 15-min Total | Rolling One Hour |  |  |  |  |
|                                  | Eastbound |    |    | Westbound |    |    | Northbound   |    |    | Southbound   |    |    |              |                  |  |  |  |  |
|                                  | LT        | TH | RT | LT        | TH | RT | LT           | TH | RT | LT           | TH | RT |              |                  |  |  |  |  |
| 7:00 AM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 0  | 0  | 0            | 0                |  |  |  |  |
| 7:15 AM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 1  | 0  | 0            | 0  | 0  | 1            | 0                |  |  |  |  |
| 7:30 AM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 1  | 0  | 0            | 0  | 0  | 1            | 0                |  |  |  |  |
| 7:45 AM                          | 0         | 0  | 0  | 0         | 0  | 0  | 1            | 0  | 0  | 0            | 0  | 0  | 1            | 3                |  |  |  |  |
| 8:00 AM                          | 0         | 0  | 0  | 0         | 0  | 0  | 1            | 1  | 0  | 0            | 0  | 0  | 2            | 5                |  |  |  |  |
| 8:15 AM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 0  | 0  | 0            | 4                |  |  |  |  |
| 8:30 AM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 0  | 0  | 0            | 3                |  |  |  |  |
| 8:45 AM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 0  | 0  | 0            | 2                |  |  |  |  |
| Count Total                      | 0         | 0  | 0  | 0         | 0  | 0  | 2            | 3  | 0  | 0            | 0  | 0  | 5            | 0                |  |  |  |  |
| Peak Hour                        | 0         | 0  | 0  | 0         | 0  | 0  | 1            | 1  | 0  | 0            | 0  | 0  | 2            | 0                |  |  |  |  |

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

**Two-Hour Count Summaries**

| Interval Start |         | Rd 20     |    |    |     | Driveway  |    |    |    | El Portal Dr |     |       |    | El Portal Dr |    |       |    | 15-min Total | Rolling One Hour |
|----------------|---------|-----------|----|----|-----|-----------|----|----|----|--------------|-----|-------|----|--------------|----|-------|----|--------------|------------------|
|                |         | Eastbound |    |    |     | Westbound |    |    |    | Northbound   |     |       |    | Southbound   |    |       |    |              |                  |
|                |         | UT        | LT | TH | RT  | UT        | LT | TH | RT | UT           | LT  | TH    | RT | UT           | LT | TH    | RT |              |                  |
|                | 4:00 PM | 0         | 2  | 0  | 29  | 0         | 0  | 0  | 1  | 0            | 50  | 128   | 0  | 0            | 0  | 140   | 7  | 357          | 0                |
|                | 4:15 PM | 0         | 5  | 0  | 28  | 0         | 0  | 0  | 0  | 0            | 50  | 131   | 0  | 0            | 0  | 122   | 7  | 343          | 0                |
|                | 4:30 PM | 0         | 2  | 0  | 31  | 0         | 0  | 0  | 2  | 0            | 39  | 116   | 1  | 0            | 0  | 139   | 10 | 340          | 0                |
|                | 4:45 PM | 0         | 5  | 0  | 43  | 0         | 0  | 0  | 1  | 0            | 48  | 135   | 0  | 0            | 0  | 111   | 6  | 349          | 1,389            |
|                | 5:00 PM | 0         | 7  | 0  | 30  | 0         | 0  | 0  | 1  | 0            | 40  | 136   | 0  | 0            | 0  | 128   | 3  | 345          | 1,377            |
|                | 5:15 PM | 0         | 3  | 0  | 34  | 0         | 0  | 0  | 0  | 0            | 41  | 139   | 0  | 0            | 0  | 131   | 4  | 352          | 1,386            |
|                | 5:30 PM | 0         | 1  | 0  | 32  | 0         | 0  | 0  | 0  | 0            | 37  | 126   | 0  | 0            | 0  | 136   | 3  | 335          | 1,381            |
|                | 5:45 PM | 0         | 11 | 0  | 51  | 0         | 0  | 0  | 0  | 0            | 48  | 146   | 0  | 0            | 0  | 142   | 5  | 403          | 1,435            |
| Count Total    |         | 0         | 36 | 0  | 278 | 0         | 0  | 0  | 5  | 0            | 353 | 1,057 | 1  | 0            | 0  | 1,049 | 45 | 2,824        | 0                |
| Peak Hour      | All     | 0         | 22 | 0  | 147 | 0         | 0  | 0  | 1  | 0            | 166 | 547   | 0  | 0            | 0  | 537   | 15 | 1,435        | 0                |
|                | HV      | 0         | 0  | 0  | 3   | 0         | 0  | 0  | 0  | 0            | 2   | 9     | 0  | 0            | 0  | 3     | 0  | 17           | 0                |
|                | HV%     | -         | 0% | -  | 2%  | -         | -  | -  | 0% | -            | 1%  | 2%    | -  | -            | -  | 1%    | 0% | 1%           | 0                |

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

| Interval Start | Heavy Vehicle Totals |    |    |    |       | Bicycles |    |    |    |       | Pedestrians (Crossing Leg) |      |       |       |       |
|----------------|----------------------|----|----|----|-------|----------|----|----|----|-------|----------------------------|------|-------|-------|-------|
|                | EB                   | WB | NB | SB | Total | EB       | WB | NB | SB | Total | East                       | West | North | South | Total |
| 4:00 PM        | 1                    | 0  | 5  | 2  | 8     | 0        | 0  | 0  | 0  | 0     | 2                          | 1    | 0     | 2     | 5     |
| 4:15 PM        | 2                    | 0  | 3  | 4  | 9     | 0        | 0  | 1  | 1  | 2     | 1                          | 3    | 1     | 2     | 7     |
| 4:30 PM        | 0                    | 0  | 14 | 2  | 16    | 0        | 0  | 1  | 0  | 1     | 2                          | 1    | 0     | 1     | 4     |
| 4:45 PM        | 1                    | 0  | 4  | 4  | 9     | 0        | 0  | 0  | 1  | 1     | 0                          | 2    | 0     | 0     | 2     |
| 5:00 PM        | 1                    | 0  | 2  | 0  | 3     | 0        | 0  | 2  | 1  | 3     | 0                          | 1    | 0     | 2     | 3     |
| 5:15 PM        | 1                    | 0  | 1  | 1  | 3     | 2        | 0  | 0  | 0  | 2     | 6                          | 1    | 0     | 2     | 9     |
| 5:30 PM        | 1                    | 0  | 4  | 2  | 7     | 0        | 0  | 0  | 0  | 0     | 1                          | 1    | 0     | 1     | 3     |
| 5:45 PM        | 0                    | 0  | 4  | 0  | 4     | 0        | 0  | 0  | 0  | 0     | 1                          | 1    | 0     | 1     | 3     |
| Count Total    | 7                    | 0  | 37 | 15 | 59    | 2        | 0  | 4  | 3  | 9     | 13                         | 11   | 1     | 11    | 36    |
| Peak Hour      | 3                    | 0  | 11 | 3  | 17    | 2        | 0  | 2  | 1  | 5     | 8                          | 4    | 0     | 6     | 18    |

| Two-Hour Count Summaries - Heavy Vehicles |           |    |    |    |           |    |    |    |              |    |    |    |              |    |    |    |              |                  |
|-------------------------------------------|-----------|----|----|----|-----------|----|----|----|--------------|----|----|----|--------------|----|----|----|--------------|------------------|
| Interval Start                            | Rd 20     |    |    |    | Driveway  |    |    |    | El Portal Dr |    |    |    | El Portal Dr |    |    |    | 15-min Total | Rolling One Hour |
|                                           | Eastbound |    |    |    | Westbound |    |    |    | Northbound   |    |    |    | Southbound   |    |    |    |              |                  |
|                                           | UT        | LT | TH | RT | UT        | LT | TH | RT | UT           | LT | TH | RT | UT           | LT | TH | RT |              |                  |
| 4:00 PM                                   | 0         | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0            | 0  | 5  | 0  | 0            | 0  | 2  | 0  | 8            | 0                |
| 4:15 PM                                   | 0         | 0  | 0  | 2  | 0         | 0  | 0  | 0  | 0            | 1  | 2  | 0  | 0            | 0  | 4  | 0  | 9            | 0                |
| 4:30 PM                                   | 0         | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0            | 3  | 10 | 1  | 0            | 0  | 2  | 0  | 16           | 0                |
| 4:45 PM                                   | 0         | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0            | 0  | 4  | 0  | 0            | 0  | 4  | 0  | 9            | 42               |
| 5:00 PM                                   | 0         | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0            | 0  | 2  | 0  | 0            | 0  | 0  | 0  | 3            | 37               |
| 5:15 PM                                   | 0         | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0            | 0  | 1  | 0  | 0            | 0  | 1  | 0  | 3            | 31               |
| 5:30 PM                                   | 0         | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0            | 1  | 3  | 0  | 0            | 0  | 2  | 0  | 7            | 22               |
| 5:45 PM                                   | 0         | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0            | 1  | 3  | 0  | 0            | 0  | 0  | 0  | 4            | 17               |
| Count Total                               | 0         | 0  | 0  | 7  | 0         | 0  | 0  | 0  | 0            | 6  | 30 | 1  | 0            | 0  | 15 | 0  | 59           | 0                |
| Peak Hour                                 | 0         | 0  | 0  | 3  | 0         | 0  | 0  | 0  | 0            | 2  | 9  | 0  | 0            | 0  | 3  | 0  | 17           | 0                |

| Two-Hour Count Summaries - Bikes |           |    |    |           |    |    |              |    |    |              |    |    |              |                  |  |  |  |  |
|----------------------------------|-----------|----|----|-----------|----|----|--------------|----|----|--------------|----|----|--------------|------------------|--|--|--|--|
| Interval Start                   | Rd 20     |    |    | Driveway  |    |    | El Portal Dr |    |    | El Portal Dr |    |    | 15-min Total | Rolling One Hour |  |  |  |  |
|                                  | Eastbound |    |    | Westbound |    |    | Northbound   |    |    | Southbound   |    |    |              |                  |  |  |  |  |
|                                  | LT        | TH | RT | LT        | TH | RT | LT           | TH | RT | LT           | TH | RT |              |                  |  |  |  |  |
| 4:00 PM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 0  | 0  | 0            | 0                |  |  |  |  |
| 4:15 PM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 1  | 0  | 0            | 1  | 0  | 2            | 0                |  |  |  |  |
| 4:30 PM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 1  | 0  | 0            | 0  | 0  | 1            | 0                |  |  |  |  |
| 4:45 PM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 1  | 0  | 1            | 4                |  |  |  |  |
| 5:00 PM                          | 0         | 0  | 0  | 0         | 0  | 0  | 2            | 0  | 0  | 0            | 1  | 0  | 3            | 7                |  |  |  |  |
| 5:15 PM                          | 0         | 0  | 2  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 0  | 0  | 2            | 7                |  |  |  |  |
| 5:30 PM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 0  | 0  | 0            | 6                |  |  |  |  |
| 5:45 PM                          | 0         | 0  | 0  | 0         | 0  | 0  | 0            | 0  | 0  | 0            | 0  | 0  | 0            | 5                |  |  |  |  |
| Count Total                      | 0         | 0  | 2  | 0         | 0  | 0  | 2            | 2  | 0  | 0            | 3  | 0  | 9            | 0                |  |  |  |  |
| Peak Hour                        | 0         | 0  | 2  | 0         | 0  | 0  | 2            | 0  | 0  | 0            | 1  | 0  | 5            | 0                |  |  |  |  |

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

## Appendix B – Existing Conditions Intersection Level of Service and Queuing Analysis Work Sheets

## Queues

## 1: San Pablo Ave &amp; 23rd St/Road 20

## Existing Conditions

Timing Plan: A.M. Peak

|                         |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Group Flow (vph)   | 271                                                                               | 279                                                                               | 99                                                                                | 233                                                                               | 102                                                                               | 97                                                                                | 374                                                                                | 58                                                                                  | 464                                                                                 | 457                                                                                 |
| v/c Ratio               | 0.74                                                                              | 0.74                                                                              | 0.27                                                                              | 0.74                                                                              | 0.27                                                                              | 0.63                                                                              | 0.37                                                                               | 0.55                                                                                | 0.49                                                                                | 0.57                                                                                |
| Control Delay           | 76.9                                                                              | 76.0                                                                              | 4.2                                                                               | 84.7                                                                              | 5.0                                                                               | 100.2                                                                             | 49.7                                                                               | 106.2                                                                               | 56.3                                                                                | 22.6                                                                                |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay             | 76.9                                                                              | 76.0                                                                              | 4.2                                                                               | 84.7                                                                              | 5.0                                                                               | 100.2                                                                             | 49.7                                                                               | 106.2                                                                               | 56.3                                                                                | 22.6                                                                                |
| Queue Length 50th (ft)  | 307                                                                               | 316                                                                               | 0                                                                                 | 257                                                                               | 0                                                                                 | 109                                                                               | 187                                                                                | 66                                                                                  | 247                                                                                 | 245                                                                                 |
| Queue Length 95th (ft)  | 524                                                                               | 534                                                                               | 18                                                                                | 442                                                                               | 22                                                                                | 218                                                                               | 280                                                                                | #174                                                                                | 369                                                                                 | 407                                                                                 |
| Internal Link Dist (ft) |                                                                                   | 368                                                                               |                                                                                   | 769                                                                               |                                                                                   |                                                                                   | 1025                                                                               |                                                                                     | 421                                                                                 |                                                                                     |
| Turn Bay Length (ft)    |                                                                                   |                                                                                   | 135                                                                               |                                                                                   |                                                                                   | 155                                                                               |                                                                                    | 90                                                                                  |                                                                                     | 90                                                                                  |
| Base Capacity (vph)     | 597                                                                               | 620                                                                               | 520                                                                               | 525                                                                               | 537                                                                               | 251                                                                               | 1697                                                                               | 126                                                                                 | 1510                                                                                | 1073                                                                                |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Reduced v/c Ratio       | 0.45                                                                              | 0.45                                                                              | 0.19                                                                              | 0.44                                                                              | 0.19                                                                              | 0.39                                                                              | 0.22                                                                               | 0.46                                                                                | 0.31                                                                                | 0.43                                                                                |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

1: San Pablo Ave & 23rd St/Road 20

Existing Conditions

Timing Plan: A.M. Peak

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |  |                                                                                   |  |  |  |  |                                                                                     |  |  |  |
| Traffic Volume (vph)              | 328                                                                               | 178                                                                               | 91                                                                                | 40                                                                                | 175                                                                               | 94                                                                                | 89                                                                                  | 280                                                                                 | 64                                                                                  | 53                                                                                  | 427                                                                                 | 420                                                                                 |
| Future Volume (vph)               | 328                                                                               | 178                                                                               | 91                                                                                | 40                                                                                | 175                                                                               | 94                                                                                | 89                                                                                  | 280                                                                                 | 64                                                                                  | 53                                                                                  | 427                                                                                 | 420                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 6.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 |
| Lane Util. Factor                 | 0.95                                                                              | 0.95                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 0.95                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 0.83                                                                              |                                                                                   | 1.00                                                                              | 0.98                                                                              | 1.00                                                                                | 0.99                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                                | 0.97                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     | 0.95                                                                              | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 | 1681                                                                              | 1743                                                                              | 1316                                                                              |                                                                                   | 1846                                                                              | 1551                                                                              | 1770                                                                                | 3406                                                                                |                                                                                     | 1770                                                                                | 3539                                                                                | 1583                                                                                |
| Flt Permitted                     | 0.95                                                                              | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 | 1681                                                                              | 1743                                                                              | 1316                                                                              |                                                                                   | 1846                                                                              | 1551                                                                              | 1770                                                                                | 3406                                                                                |                                                                                     | 1770                                                                                | 3539                                                                                | 1583                                                                                |
| Peak-hour factor, PHF             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 357                                                                               | 193                                                                               | 99                                                                                | 43                                                                                | 190                                                                               | 102                                                                               | 97                                                                                  | 304                                                                                 | 70                                                                                  | 58                                                                                  | 464                                                                                 | 457                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                 | 85                                                                                | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 271                                                                               | 279                                                                               | 22                                                                                | 0                                                                                 | 233                                                                               | 17                                                                                | 97                                                                                  | 374                                                                                 | 0                                                                                   | 58                                                                                  | 464                                                                                 | 457                                                                                 |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   | 77                                                                                |                                                                                   |                                                                                   | 4                                                                                 |                                                                                     |                                                                                     | 19                                                                                  |                                                                                     |                                                                                     | 22                                                                                  |
| Confl. Bikes (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1                                                                                 |                                                                                     |                                                                                     | 1                                                                                   |                                                                                     |                                                                                     | 1                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                | Perm                                                                              | Split                                                                             | NA                                                                                | Perm                                                                              | Prot                                                                                | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  | pt+ov                                                                               |
| Protected Phases                  | 4                                                                                 | 4                                                                                 |                                                                                   | 8                                                                                 | 8                                                                                 |                                                                                   | 5                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   | 6 4                                                                                 |
| Permitted Phases                  |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 34.8                                                                              | 34.8                                                                              | 34.8                                                                              |                                                                                   | 27.1                                                                              | 27.1                                                                              | 14.0                                                                                | 46.9                                                                                |                                                                                     | 9.5                                                                                 | 42.4                                                                                | 77.2                                                                                |
| Effective Green, g (s)            | 34.8                                                                              | 34.8                                                                              | 34.8                                                                              |                                                                                   | 27.1                                                                              | 27.1                                                                              | 14.0                                                                                | 46.9                                                                                |                                                                                     | 9.5                                                                                 | 42.4                                                                                | 77.2                                                                                |
| Actuated g/C Ratio                | 0.22                                                                              | 0.22                                                                              | 0.22                                                                              |                                                                                   | 0.17                                                                              | 0.17                                                                              | 0.09                                                                                | 0.29                                                                                |                                                                                     | 0.06                                                                                | 0.27                                                                                | 0.48                                                                                |
| Clearance Time (s)                | 6.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 2.0                                                                                 | 5.0                                                                                 |                                                                                     | 2.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 366                                                                               | 380                                                                               | 287                                                                               |                                                                                   | 313                                                                               | 263                                                                               | 155                                                                                 | 1001                                                                                |                                                                                     | 105                                                                                 | 940                                                                                 | 766                                                                                 |
| v/s Ratio Prot                    | c0.16                                                                             | 0.16                                                                              |                                                                                   |                                                                                   | c0.13                                                                             |                                                                                   | c0.05                                                                               | c0.11                                                                               |                                                                                     | 0.03                                                                                | 0.13                                                                                | c0.29                                                                               |
| v/s Ratio Perm                    |                                                                                   |                                                                                   | 0.02                                                                              |                                                                                   |                                                                                   | 0.01                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.74                                                                              | 0.73                                                                              | 0.08                                                                              |                                                                                   | 0.74                                                                              | 0.07                                                                              | 0.63                                                                                | 0.37                                                                                |                                                                                     | 0.55                                                                                | 0.49                                                                                | 0.60                                                                                |
| Uniform Delay, d1                 | 58.1                                                                              | 58.0                                                                              | 49.6                                                                              |                                                                                   | 62.9                                                                              | 55.6                                                                              | 70.2                                                                                | 44.7                                                                                |                                                                                     | 72.9                                                                                | 49.5                                                                                | 29.9                                                                                |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Incremental Delay, d2             | 6.9                                                                               | 6.2                                                                               | 0.0                                                                               |                                                                                   | 9.2                                                                               | 0.1                                                                               | 5.6                                                                                 | 0.5                                                                                 |                                                                                     | 3.5                                                                                 | 0.9                                                                                 | 1.9                                                                                 |
| Delay (s)                         | 65.0                                                                              | 64.3                                                                              | 49.6                                                                              |                                                                                   | 72.1                                                                              | 55.7                                                                              | 75.8                                                                                | 45.1                                                                                |                                                                                     | 76.5                                                                                | 50.3                                                                                | 31.7                                                                                |
| Level of Service                  | E                                                                                 | E                                                                                 | D                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | E                                                                                   | D                                                                                   |                                                                                     | E                                                                                   | D                                                                                   | C                                                                                   |
| Approach Delay (s)                |                                                                                   | 62.3                                                                              |                                                                                   |                                                                                   | 67.1                                                                              |                                                                                   |                                                                                     | 51.5                                                                                |                                                                                     |                                                                                     | 43.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 53.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | HCM 2000 Level of Service D                                                         |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.62                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 159.5                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | Sum of lost time (s) 30.0                                                           |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 66.9%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | ICU Level of Service C                                                              |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Queues  
2: El Portal Dr & Road 20

Existing Conditions  
Timing Plan: A.M. Peak



| Lane Group              | EBL  | NBL  | NBT  | SBT  | SBR  |
|-------------------------|------|------|------|------|------|
| Lane Group Flow (vph)   | 64   | 262  | 647  | 585  | 92   |
| v/c Ratio               | 0.25 | 0.74 | 0.23 | 0.32 | 0.11 |
| Control Delay           | 26.0 | 41.6 | 4.2  | 13.2 | 7.6  |
| Queue Delay             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Total Delay             | 26.0 | 41.6 | 4.2  | 13.2 | 7.6  |
| Queue Length 50th (ft)  | 26   | 102  | 28   | 76   | 7    |
| Queue Length 95th (ft)  | 42   | #235 | 114  | 162  | 42   |
| Internal Link Dist (ft) | 292  |      | 120  | 382  |      |
| Turn Bay Length (ft)    |      | 155  |      |      | 45   |
| Base Capacity (vph)     | 632  | 362  | 2861 | 1849 | 830  |
| Starvation Cap Reductn  | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.10 | 0.72 | 0.23 | 0.32 | 0.11 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 2: El Portal Dr & Road 20

Existing Conditions

Timing Plan: A.M. Peak



| Movement                          | EBL   | EBR  | NBL   | NBT  | SBT                       | SBR  |
|-----------------------------------|-------|------|-------|------|---------------------------|------|
| Lane Configurations               |       |      |       |      |                           |      |
| Traffic Volume (vph)              | 59    | 0    | 241   | 595  | 538                       | 85   |
| Future Volume (vph)               | 59    | 0    | 241   | 595  | 538                       | 85   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900  | 1900 | 1900                      | 1900 |
| Total Lost time (s)               | 4.0   |      | 4.0   | 5.0  | 5.0                       | 5.0  |
| Lane Util. Factor                 | 1.00  |      | 1.00  | 0.95 | 0.95                      | 1.00 |
| Flpb, ped/bikes                   | 1.00  |      | 1.00  | 1.00 | 1.00                      | 0.97 |
| Flpb, ped/bikes                   | 1.00  |      | 1.00  | 1.00 | 1.00                      | 1.00 |
| Frt                               | 1.00  |      | 1.00  | 1.00 | 1.00                      | 0.85 |
| Flt Protected                     | 0.95  |      | 0.95  | 1.00 | 1.00                      | 1.00 |
| Satd. Flow (prot)                 | 1770  |      | 1770  | 3539 | 3539                      | 1534 |
| Flt Permitted                     | 0.95  |      | 0.95  | 1.00 | 1.00                      | 1.00 |
| Satd. Flow (perm)                 | 1770  |      | 1770  | 3539 | 3539                      | 1534 |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92  | 0.92 | 0.92                      | 0.92 |
| Adj. Flow (vph)                   | 64    | 0    | 262   | 647  | 585                       | 92   |
| RTOR Reduction (vph)              | 0     | 0    | 0     | 0    | 0                         | 30   |
| Lane Group Flow (vph)             | 64    | 0    | 262   | 647  | 585                       | 62   |
| Confl. Peds. (#/hr)               |       | 11   |       |      |                           | 7    |
| Turn Type                         | Perm  |      | Prot  | NA   | NA                        | Perm |
| Protected Phases                  |       |      | 1     | 6    | 2                         |      |
| Permitted Phases                  | 8     |      |       |      |                           | 2    |
| Actuated Green, G (s)             | 8.0   |      | 14.0  | 53.0 | 35.0                      | 35.0 |
| Effective Green, g (s)            | 8.0   |      | 14.0  | 53.0 | 35.0                      | 35.0 |
| Actuated g/C Ratio                | 0.11  |      | 0.20  | 0.76 | 0.50                      | 0.50 |
| Clearance Time (s)                | 4.0   |      | 4.0   | 5.0  | 5.0                       | 5.0  |
| Vehicle Extension (s)             | 2.0   |      | 2.0   | 4.0  | 4.0                       | 4.0  |
| Lane Grp Cap (vph)                | 202   |      | 354   | 2679 | 1769                      | 767  |
| v/s Ratio Prot                    |       |      | c0.15 | 0.18 | c0.17                     |      |
| v/s Ratio Perm                    | c0.04 |      |       |      |                           | 0.04 |
| v/c Ratio                         | 0.32  |      | 0.74  | 0.24 | 0.33                      | 0.08 |
| Uniform Delay, d1                 | 28.5  |      | 26.3  | 2.5  | 10.5                      | 9.1  |
| Progression Factor                | 1.00  |      | 1.00  | 1.00 | 1.00                      | 1.00 |
| Incremental Delay, d2             | 0.3   |      | 7.1   | 0.2  | 0.5                       | 0.2  |
| Delay (s)                         | 28.8  |      | 33.4  | 2.7  | 11.0                      | 9.3  |
| Level of Service                  | C     |      | C     | A    | B                         | A    |
| Approach Delay (s)                | 28.8  |      |       | 11.6 | 10.8                      |      |
| Approach LOS                      | C     |      |       | B    | B                         |      |
| <b>Intersection Summary</b>       |       |      |       |      |                           |      |
| HCM 2000 Control Delay            |       |      | 11.9  |      | HCM 2000 Level of Service | B    |
| HCM 2000 Volume to Capacity ratio |       |      | 0.43  |      |                           |      |
| Actuated Cycle Length (s)         |       |      | 70.0  |      | Sum of lost time (s)      | 13.0 |
| Intersection Capacity Utilization |       |      | 50.9% |      | ICU Level of Service      | A    |
| Analysis Period (min)             |       |      | 15    |      |                           |      |
| c Critical Lane Group             |       |      |       |      |                           |      |

## Queues

## 1: San Pablo Ave &amp; 23rd St/Road 20

## Existing Conditions

Timing Plan: P.M. Peak

|                         |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Group Flow (vph)   | 284                                                                               | 290                                                                               | 104                                                                               | 129                                                                               | 48                                                                                | 132                                                                               | 749                                                                                | 27                                                                                  | 309                                                                                 | 400                                                                                 |
| v/c Ratio               | 0.72                                                                              | 0.72                                                                              | 0.23                                                                              | 0.58                                                                              | 0.16                                                                              | 0.64                                                                              | 0.61                                                                               | 0.30                                                                                | 0.36                                                                                | 0.50                                                                                |
| Control Delay           | 66.7                                                                              | 66.4                                                                              | 4.2                                                                               | 80.2                                                                              | 1.1                                                                               | 84.5                                                                              | 47.2                                                                               | 91.1                                                                                | 51.1                                                                                | 18.6                                                                                |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay             | 66.7                                                                              | 66.4                                                                              | 4.2                                                                               | 80.2                                                                              | 1.1                                                                               | 84.5                                                                              | 47.2                                                                               | 91.1                                                                                | 51.1                                                                                | 18.6                                                                                |
| Queue Length 50th (ft)  | 293                                                                               | 298                                                                               | 0                                                                                 | 131                                                                               | 0                                                                                 | 134                                                                               | 375                                                                                | 28                                                                                  | 147                                                                                 | 178                                                                                 |
| Queue Length 95th (ft)  | 491                                                                               | 498                                                                               | 25                                                                                | 246                                                                               | 0                                                                                 | #285                                                                              | 542                                                                                | 76                                                                                  | 227                                                                                 | 282                                                                                 |
| Internal Link Dist (ft) |                                                                                   | 368                                                                               |                                                                                   | 769                                                                               |                                                                                   |                                                                                   | 1025                                                                               |                                                                                     | 421                                                                                 |                                                                                     |
| Turn Bay Length (ft)    |                                                                                   |                                                                                   | 135                                                                               |                                                                                   |                                                                                   | 155                                                                               |                                                                                    | 90                                                                                  |                                                                                     | 90                                                                                  |
| Base Capacity (vph)     | 665                                                                               | 680                                                                               | 682                                                                               | 586                                                                               | 585                                                                               | 280                                                                               | 1931                                                                               | 140                                                                                 | 1682                                                                                | 1142                                                                                |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Reduced v/c Ratio       | 0.43                                                                              | 0.43                                                                              | 0.15                                                                              | 0.22                                                                              | 0.08                                                                              | 0.47                                                                              | 0.39                                                                               | 0.19                                                                                | 0.18                                                                                | 0.35                                                                                |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

1: San Pablo Ave & 23rd St/Road 20

Existing Conditions

Timing Plan: P.M. Peak

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |  |                                                                                   |  |  |   |  |                                                                                     |  |  |  |
| Traffic Volume (vph)              | 428                                                                               | 100                                                                               | 96                                                                                | 17                                                                                | 102                                                                               | 44                                                                                | 121                                                                                 | 636                                                                                 | 53                                                                                  | 25                                                                                  | 284                                                                                 | 368                                                                                 |
| Future Volume (vph)               | 428                                                                               | 100                                                                               | 96                                                                                | 17                                                                                | 102                                                                               | 44                                                                                | 121                                                                                 | 636                                                                                 | 53                                                                                  | 25                                                                                  | 284                                                                                 | 368                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 6.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 |
| Lane Util. Factor                 | 0.95                                                                              | 0.95                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 0.95                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 0.97                                                                              |                                                                                   | 1.00                                                                              | 0.98                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                                | 0.99                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     | 0.95                                                                              | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 | 1681                                                                              | 1716                                                                              | 1533                                                                              |                                                                                   | 1850                                                                              | 1552                                                                              | 1770                                                                                | 3484                                                                                |                                                                                     | 1770                                                                                | 3539                                                                                | 1583                                                                                |
| Flt Permitted                     | 0.95                                                                              | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 | 1681                                                                              | 1716                                                                              | 1533                                                                              |                                                                                   | 1850                                                                              | 1552                                                                              | 1770                                                                                | 3484                                                                                |                                                                                     | 1770                                                                                | 3539                                                                                | 1583                                                                                |
| Peak-hour factor, PHF             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 465                                                                               | 109                                                                               | 104                                                                               | 18                                                                                | 111                                                                               | 48                                                                                | 132                                                                                 | 691                                                                                 | 58                                                                                  | 27                                                                                  | 309                                                                                 | 400                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 80                                                                                | 0                                                                                 | 0                                                                                 | 42                                                                                | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 284                                                                               | 290                                                                               | 24                                                                                | 0                                                                                 | 129                                                                               | 6                                                                                 | 132                                                                                 | 749                                                                                 | 0                                                                                   | 27                                                                                  | 309                                                                                 | 400                                                                                 |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   | 10                                                                                |                                                                                   |                                                                                   | 3                                                                                 |                                                                                     |                                                                                     | 21                                                                                  |                                                                                     |                                                                                     | 2                                                                                   |
| Confl. Bikes (#/hr)               |                                                                                   |                                                                                   | 1                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     | 1                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                | Perm                                                                              | Split                                                                             | NA                                                                                | Perm                                                                              | Prot                                                                                | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  | pt+ov                                                                               |
| Protected Phases                  | 4                                                                                 | 4                                                                                 |                                                                                   | 8                                                                                 | 8                                                                                 |                                                                                   | 5                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   | 6 4                                                                                 |
| Permitted Phases                  |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 33.9                                                                              | 33.9                                                                              | 33.9                                                                              |                                                                                   | 17.3                                                                              | 17.3                                                                              | 16.8                                                                                | 51.1                                                                                |                                                                                     | 4.1                                                                                 | 38.4                                                                                | 72.3                                                                                |
| Effective Green, g (s)            | 33.9                                                                              | 33.9                                                                              | 33.9                                                                              |                                                                                   | 17.3                                                                              | 17.3                                                                              | 16.8                                                                                | 51.1                                                                                |                                                                                     | 4.1                                                                                 | 38.4                                                                                | 72.3                                                                                |
| Actuated g/C Ratio                | 0.23                                                                              | 0.23                                                                              | 0.23                                                                              |                                                                                   | 0.12                                                                              | 0.12                                                                              | 0.11                                                                                | 0.35                                                                                |                                                                                     | 0.03                                                                                | 0.26                                                                                | 0.49                                                                                |
| Clearance Time (s)                | 6.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 2.0                                                                                 | 5.0                                                                                 |                                                                                     | 2.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 386                                                                               | 394                                                                               | 352                                                                               |                                                                                   | 216                                                                               | 182                                                                               | 201                                                                                 | 1206                                                                                |                                                                                     | 49                                                                                  | 921                                                                                 | 775                                                                                 |
| v/s Ratio Prot                    | 0.17                                                                              | c0.17                                                                             |                                                                                   |                                                                                   | c0.07                                                                             |                                                                                   | c0.07                                                                               | c0.21                                                                               |                                                                                     | 0.02                                                                                | 0.09                                                                                | 0.25                                                                                |
| v/s Ratio Perm                    |                                                                                   |                                                                                   | 0.02                                                                              |                                                                                   |                                                                                   | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.74                                                                              | 0.74                                                                              | 0.07                                                                              |                                                                                   | 0.60                                                                              | 0.03                                                                              | 0.66                                                                                | 0.62                                                                                |                                                                                     | 0.55                                                                                | 0.34                                                                                | 0.52                                                                                |
| Uniform Delay, d1                 | 52.6                                                                              | 52.7                                                                              | 44.4                                                                              |                                                                                   | 61.8                                                                              | 57.7                                                                              | 62.6                                                                                | 40.1                                                                                |                                                                                     | 70.8                                                                                | 44.2                                                                                | 25.7                                                                                |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Incremental Delay, d2             | 6.2                                                                               | 6.1                                                                               | 0.0                                                                               |                                                                                   | 4.4                                                                               | 0.1                                                                               | 5.8                                                                                 | 1.4                                                                                 |                                                                                     | 7.4                                                                                 | 0.5                                                                                 | 1.2                                                                                 |
| Delay (s)                         | 58.8                                                                              | 58.7                                                                              | 44.5                                                                              |                                                                                   | 66.2                                                                              | 57.7                                                                              | 68.4                                                                                | 41.6                                                                                |                                                                                     | 78.2                                                                                | 44.7                                                                                | 26.8                                                                                |
| Level of Service                  | E                                                                                 | E                                                                                 | D                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | E                                                                                   | D                                                                                   |                                                                                     | E                                                                                   | D                                                                                   | C                                                                                   |
| Approach Delay (s)                |                                                                                   | 56.6                                                                              |                                                                                   |                                                                                   | 63.9                                                                              |                                                                                   |                                                                                     | 45.6                                                                                |                                                                                     |                                                                                     | 36.2                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 47.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | D                                                                                   |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.61                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 147.5                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 58.9%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Queues  
2: El Portal Dr & Road 20

Existing Conditions  
Timing Plan: P.M. Peak



| Lane Group              | EBL  | NBL  | NBT  | SBT  | SBR  |
|-------------------------|------|------|------|------|------|
| Lane Group Flow (vph)   | 29   | 224  | 737  | 724  | 21   |
| v/c Ratio               | 0.10 | 0.54 | 0.24 | 0.45 | 0.03 |
| Control Delay           | 21.7 | 25.6 | 3.5  | 13.9 | 11.4 |
| Queue Delay             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Total Delay             | 21.7 | 25.6 | 3.5  | 13.9 | 11.4 |
| Queue Length 50th (ft)  | 5    | 36   | 0    | 43   | 1    |
| Queue Length 95th (ft)  | 32   | 188  | 135  | 239  | 20   |
| Internal Link Dist (ft) | 292  |      | 120  | 382  |      |
| Turn Bay Length (ft)    |      | 155  |      |      | 45   |
| Base Capacity (vph)     | 1006 | 798  | 3229 | 2395 | 1043 |
| Starvation Cap Reductn  | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.03 | 0.28 | 0.23 | 0.30 | 0.02 |
| Intersection Summary    |      |      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

## 2: El Portal Dr & Road 20

Existing Conditions

Timing Plan: P.M. Peak



| Movement                          | EBL   | EBR   | NBL   | NBT                       | SBT   | SBR  |
|-----------------------------------|-------|-------|-------|---------------------------|-------|------|
| Lane Configurations               |       |       |       |                           |       |      |
| Traffic Volume (vph)              | 27    | 0     | 206   | 678                       | 666   | 19   |
| Future Volume (vph)               | 27    | 0     | 206   | 678                       | 666   | 19   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900  | 1900                      | 1900  | 1900 |
| Total Lost time (s)               | 4.0   |       | 4.0   | 5.0                       | 5.0   | 5.0  |
| Lane Util. Factor                 | 1.00  |       | 1.00  | 0.95                      | 0.95  | 1.00 |
| Frpb, ped/bikes                   | 1.00  |       | 1.00  | 1.00                      | 1.00  | 0.97 |
| Flpb, ped/bikes                   | 1.00  |       | 1.00  | 1.00                      | 1.00  | 1.00 |
| Frt                               | 1.00  |       | 1.00  | 1.00                      | 1.00  | 0.85 |
| Flt Protected                     | 0.95  |       | 0.95  | 1.00                      | 1.00  | 1.00 |
| Satd. Flow (prot)                 | 1770  |       | 1770  | 3539                      | 3539  | 1543 |
| Flt Permitted                     | 0.95  |       | 0.95  | 1.00                      | 1.00  | 1.00 |
| Satd. Flow (perm)                 | 1770  |       | 1770  | 3539                      | 3539  | 1543 |
| Peak-hour factor, PHF             | 0.92  | 0.92  | 0.92  | 0.92                      | 0.92  | 0.92 |
| Adj. Flow (vph)                   | 29    | 0     | 224   | 737                       | 724   | 21   |
| RTOR Reduction (vph)              | 0     | 0     | 0     | 0                         | 0     | 5    |
| Lane Group Flow (vph)             | 29    | 0     | 224   | 737                       | 724   | 16   |
| Confl. Peds. (#/hr)               |       | 6     |       |                           |       | 4    |
| Confl. Bikes (#/hr)               |       |       |       |                           |       | 1    |
| Turn Type                         | Perm  |       | Prot  | NA                        | NA    | Perm |
| Protected Phases                  |       |       | 1     | 6                         | 2     |      |
| Permitted Phases                  | 8     |       |       |                           |       | 2    |
| Actuated Green, G (s)             | 4.2   |       | 11.9  | 39.8                      | 23.9  | 23.9 |
| Effective Green, g (s)            | 4.2   |       | 11.9  | 39.8                      | 23.9  | 23.9 |
| Actuated g/C Ratio                | 0.08  |       | 0.22  | 0.75                      | 0.45  | 0.45 |
| Clearance Time (s)                | 4.0   |       | 4.0   | 5.0                       | 5.0   | 5.0  |
| Vehicle Extension (s)             | 2.0   |       | 2.0   | 4.0                       | 4.0   | 4.0  |
| Lane Grp Cap (vph)                | 140   |       | 397   | 2657                      | 1595  | 695  |
| v/s Ratio Prot                    |       |       | c0.13 | 0.21                      | c0.20 |      |
| v/s Ratio Perm                    | c0.02 |       |       |                           |       | 0.01 |
| v/c Ratio                         | 0.21  |       | 0.56  | 0.28                      | 0.45  | 0.02 |
| Uniform Delay, d1                 | 22.8  |       | 18.2  | 2.1                       | 10.0  | 8.1  |
| Progression Factor                | 1.00  |       | 1.00  | 1.00                      | 1.00  | 1.00 |
| Incremental Delay, d2             | 0.3   |       | 1.1   | 0.1                       | 0.3   | 0.0  |
| Delay (s)                         | 23.1  |       | 19.3  | 2.2                       | 10.3  | 8.1  |
| Level of Service                  | C     |       | B     | A                         | B     | A    |
| Approach Delay (s)                | 23.1  |       |       | 6.2                       | 10.3  |      |
| Approach LOS                      | C     |       |       | A                         | B     |      |
| <b>Intersection Summary</b>       |       |       |       |                           |       |      |
| HCM 2000 Control Delay            |       | 8.2   |       | HCM 2000 Level of Service |       | A    |
| HCM 2000 Volume to Capacity ratio |       | 0.46  |       |                           |       |      |
| Actuated Cycle Length (s)         |       | 53.0  |       | Sum of lost time (s)      |       | 13.0 |
| Intersection Capacity Utilization |       | 47.5% |       | ICU Level of Service      |       | A    |
| Analysis Period (min)             |       | 15    |       |                           |       |      |
| c Critical Lane Group             |       |       |       |                           |       |      |

## Appendix C – Existing plus Project Conditions Intersections Level of Service and Queuing Work Sheets

## Queues

## Existing plus Project Conditions

## 1: San Pablo Ave &amp; 23rd St/Road 20

Timing Plan: A.M. Peak

|                         |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Group Flow (vph)   | 271                                                                               | 281                                                                               | 99                                                                                | 242                                                                               | 109                                                                               | 97                                                                                | 376                                                                                | 60                                                                                  | 464                                                                                 | 457                                                                                 |
| v/c Ratio               | 0.74                                                                              | 0.74                                                                              | 0.27                                                                              | 0.76                                                                              | 0.29                                                                              | 0.63                                                                              | 0.38                                                                               | 0.57                                                                                | 0.49                                                                                | 0.57                                                                                |
| Control Delay           | 77.6                                                                              | 77.1                                                                              | 4.2                                                                               | 85.9                                                                              | 6.3                                                                               | 101.1                                                                             | 50.1                                                                               | 107.3                                                                               | 56.7                                                                                | 22.9                                                                                |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay             | 77.6                                                                              | 77.1                                                                              | 4.2                                                                               | 85.9                                                                              | 6.3                                                                               | 101.1                                                                             | 50.1                                                                               | 107.3                                                                               | 56.7                                                                                | 22.9                                                                                |
| Queue Length 50th (ft)  | 311                                                                               | 323                                                                               | 0                                                                                 | 271                                                                               | 0                                                                                 | 110                                                                               | 190                                                                                | 69                                                                                  | 250                                                                                 | 250                                                                                 |
| Queue Length 95th (ft)  | 524                                                                               | 541                                                                               | 18                                                                                | 460                                                                               | 33                                                                                | 218                                                                               | 281                                                                                | #184                                                                                | 369                                                                                 | 407                                                                                 |
| Internal Link Dist (ft) |                                                                                   | 368                                                                               |                                                                                   | 402                                                                               |                                                                                   |                                                                                   | 1025                                                                               |                                                                                     | 421                                                                                 |                                                                                     |
| Turn Bay Length (ft)    |                                                                                   |                                                                                   | 135                                                                               |                                                                                   |                                                                                   | 155                                                                               |                                                                                    | 90                                                                                  |                                                                                     | 90                                                                                  |
| Base Capacity (vph)     | 592                                                                               | 613                                                                               | 516                                                                               | 519                                                                               | 533                                                                               | 249                                                                               | 1678                                                                               | 124                                                                                 | 1496                                                                                | 1065                                                                                |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Reduced v/c Ratio       | 0.46                                                                              | 0.46                                                                              | 0.19                                                                              | 0.47                                                                              | 0.20                                                                              | 0.39                                                                              | 0.22                                                                               | 0.48                                                                                | 0.31                                                                                | 0.43                                                                                |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

Existing plus Project Conditions

1: San Pablo Ave & 23rd St/Road 20

Timing Plan: A.M. Peak

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |  |                                                                                   |  |  |  |  |                                                                                     |  |  |  |
| Traffic Volume (vph)              | 328                                                                               | 179                                                                               | 91                                                                                | 45                                                                                | 178                                                                               | 100                                                                               | 89                                                                                  | 280                                                                                 | 66                                                                                  | 55                                                                                  | 427                                                                                 | 420                                                                                 |
| Future Volume (vph)               | 328                                                                               | 179                                                                               | 91                                                                                | 45                                                                                | 178                                                                               | 100                                                                               | 89                                                                                  | 280                                                                                 | 66                                                                                  | 55                                                                                  | 427                                                                                 | 420                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 6.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 |
| Lane Util. Factor                 | 0.95                                                                              | 0.95                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 0.95                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 0.83                                                                              |                                                                                   | 1.00                                                                              | 0.98                                                                              | 1.00                                                                                | 0.99                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                                | 0.97                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     | 0.95                                                                              | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 | 1681                                                                              | 1743                                                                              | 1314                                                                              |                                                                                   | 1844                                                                              | 1552                                                                              | 1770                                                                                | 3403                                                                                |                                                                                     | 1770                                                                                | 3539                                                                                | 1583                                                                                |
| Flt Permitted                     | 0.95                                                                              | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 | 1681                                                                              | 1743                                                                              | 1314                                                                              |                                                                                   | 1844                                                                              | 1552                                                                              | 1770                                                                                | 3403                                                                                |                                                                                     | 1770                                                                                | 3539                                                                                | 1583                                                                                |
| Peak-hour factor, PHF             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 357                                                                               | 195                                                                               | 99                                                                                | 49                                                                                | 193                                                                               | 109                                                                               | 97                                                                                  | 304                                                                                 | 72                                                                                  | 60                                                                                  | 464                                                                                 | 457                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 77                                                                                | 0                                                                                 | 0                                                                                 | 90                                                                                | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 271                                                                               | 281                                                                               | 22                                                                                | 0                                                                                 | 242                                                                               | 19                                                                                | 97                                                                                  | 376                                                                                 | 0                                                                                   | 60                                                                                  | 464                                                                                 | 457                                                                                 |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   | 77                                                                                |                                                                                   |                                                                                   | 4                                                                                 |                                                                                     |                                                                                     | 19                                                                                  |                                                                                     |                                                                                     | 22                                                                                  |
| Confl. Bikes (#/hr)               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1                                                                                 |                                                                                     |                                                                                     | 1                                                                                   |                                                                                     |                                                                                     | 1                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                | Perm                                                                              | Split                                                                             | NA                                                                                | Perm                                                                              | Prot                                                                                | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  | pt+ov                                                                               |
| Protected Phases                  | 4                                                                                 | 4                                                                                 |                                                                                   | 8                                                                                 | 8                                                                                 |                                                                                   | 5                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   | 6 4                                                                                 |
| Permitted Phases                  |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 35.0                                                                              | 35.0                                                                              | 35.0                                                                              |                                                                                   | 27.8                                                                              | 27.8                                                                              | 14.0                                                                                | 47.2                                                                                |                                                                                     | 9.6                                                                                 | 42.8                                                                                | 77.8                                                                                |
| Effective Green, g (s)            | 35.0                                                                              | 35.0                                                                              | 35.0                                                                              |                                                                                   | 27.8                                                                              | 27.8                                                                              | 14.0                                                                                | 47.2                                                                                |                                                                                     | 9.6                                                                                 | 42.8                                                                                | 77.8                                                                                |
| Actuated g/C Ratio                | 0.22                                                                              | 0.22                                                                              | 0.22                                                                              |                                                                                   | 0.17                                                                              | 0.17                                                                              | 0.09                                                                                | 0.29                                                                                |                                                                                     | 0.06                                                                                | 0.27                                                                                | 0.48                                                                                |
| Clearance Time (s)                | 6.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 2.0                                                                                 | 5.0                                                                                 |                                                                                     | 2.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 365                                                                               | 379                                                                               | 286                                                                               |                                                                                   | 318                                                                               | 268                                                                               | 154                                                                                 | 998                                                                                 |                                                                                     | 105                                                                                 | 941                                                                                 | 765                                                                                 |
| v/s Ratio Prot                    | 0.16                                                                              | c0.16                                                                             |                                                                                   |                                                                                   | c0.13                                                                             |                                                                                   | c0.05                                                                               | c0.11                                                                               |                                                                                     | 0.03                                                                                | 0.13                                                                                | c0.29                                                                               |
| v/s Ratio Perm                    |                                                                                   |                                                                                   | 0.02                                                                              |                                                                                   |                                                                                   | 0.01                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.74                                                                              | 0.74                                                                              | 0.08                                                                              |                                                                                   | 0.76                                                                              | 0.07                                                                              | 0.63                                                                                | 0.38                                                                                |                                                                                     | 0.57                                                                                | 0.49                                                                                | 0.60                                                                                |
| Uniform Delay, d1                 | 58.7                                                                              | 58.7                                                                              | 50.0                                                                              |                                                                                   | 63.3                                                                              | 55.7                                                                              | 70.9                                                                                | 45.1                                                                                |                                                                                     | 73.6                                                                                | 49.8                                                                                | 30.1                                                                                |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Incremental Delay, d2             | 7.0                                                                               | 6.7                                                                               | 0.0                                                                               |                                                                                   | 10.3                                                                              | 0.1                                                                               | 5.7                                                                                 | 0.5                                                                                 |                                                                                     | 4.6                                                                                 | 0.9                                                                                 | 1.9                                                                                 |
| Delay (s)                         | 65.7                                                                              | 65.4                                                                              | 50.1                                                                              |                                                                                   | 73.6                                                                              | 55.8                                                                              | 76.6                                                                                | 45.6                                                                                |                                                                                     | 78.2                                                                                | 50.7                                                                                | 32.0                                                                                |
| Level of Service                  | E                                                                                 | E                                                                                 | D                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | E                                                                                   | D                                                                                   |                                                                                     | E                                                                                   | D                                                                                   | C                                                                                   |
| Approach Delay (s)                |                                                                                   | 63.2                                                                              |                                                                                   |                                                                                   | 68.1                                                                              |                                                                                   |                                                                                     | 52.0                                                                                |                                                                                     |                                                                                     | 43.7                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 53.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | D                                                                                   |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.62                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 160.8                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 67.3%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | C                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Queues  
2: El Portal Dr & Road 20

Existing plus Project Conditions

Timing Plan: A.M. Peak



| Lane Group              | EBL  | NBL  | NBT  | SBT  | SBR  |
|-------------------------|------|------|------|------|------|
| Lane Group Flow (vph)   | 65   | 263  | 647  | 585  | 92   |
| v/c Ratio               | 0.25 | 0.74 | 0.23 | 0.32 | 0.11 |
| Control Delay           | 26.0 | 41.5 | 4.2  | 13.3 | 7.7  |
| Queue Delay             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Total Delay             | 26.0 | 41.5 | 4.2  | 13.3 | 7.7  |
| Queue Length 50th (ft)  | 27   | 103  | 28   | 76   | 7    |
| Queue Length 95th (ft)  | 43   | #236 | 114  | 162  | 42   |
| Internal Link Dist (ft) | 292  |      | 120  | 382  |      |
| Turn Bay Length (ft)    |      | 155  |      |      | 45   |
| Base Capacity (vph)     | 632  | 363  | 2859 | 1844 | 828  |
| Starvation Cap Reductn  | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.10 | 0.72 | 0.23 | 0.32 | 0.11 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 2: El Portal Dr & Road 20

Existing plus Project Conditions

Timing Plan: A.M. Peak

| Movement                          | EBL   | EBR  | NBL   | NBT  | SBT                       | SBR  |
|-----------------------------------|-------|------|-------|------|---------------------------|------|
| Lane Configurations               |       |      |       |      |                           |      |
| Traffic Volume (vph)              | 60    | 0    | 242   | 595  | 538                       | 85   |
| Future Volume (vph)               | 60    | 0    | 242   | 595  | 538                       | 85   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900  | 1900 | 1900                      | 1900 |
| Total Lost time (s)               | 4.0   |      | 4.0   | 5.0  | 5.0                       | 5.0  |
| Lane Util. Factor                 | 1.00  |      | 1.00  | 0.95 | 0.95                      | 1.00 |
| Frpb, ped/bikes                   | 1.00  |      | 1.00  | 1.00 | 1.00                      | 0.97 |
| Flpb, ped/bikes                   | 1.00  |      | 1.00  | 1.00 | 1.00                      | 1.00 |
| Frt                               | 1.00  |      | 1.00  | 1.00 | 1.00                      | 0.85 |
| Flt Protected                     | 0.95  |      | 0.95  | 1.00 | 1.00                      | 1.00 |
| Satd. Flow (prot)                 | 1770  |      | 1770  | 3539 | 3539                      | 1534 |
| Flt Permitted                     | 0.95  |      | 0.95  | 1.00 | 1.00                      | 1.00 |
| Satd. Flow (perm)                 | 1770  |      | 1770  | 3539 | 3539                      | 1534 |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92  | 0.92 | 0.92                      | 0.92 |
| Adj. Flow (vph)                   | 65    | 0    | 263   | 647  | 585                       | 92   |
| RTOR Reduction (vph)              | 0     | 0    | 0     | 0    | 0                         | 30   |
| Lane Group Flow (vph)             | 65    | 0    | 263   | 647  | 585                       | 62   |
| Confl. Peds. (#/hr)               |       | 11   |       |      |                           | 7    |
| Turn Type                         | Perm  |      | Prot  | NA   | NA                        | Perm |
| Protected Phases                  |       |      | 1     | 6    | 2                         |      |
| Permitted Phases                  | 8     |      |       |      |                           | 2    |
| Actuated Green, G (s)             | 8.0   |      | 14.1  | 53.0 | 34.9                      | 34.9 |
| Effective Green, g (s)            | 8.0   |      | 14.1  | 53.0 | 34.9                      | 34.9 |
| Actuated g/C Ratio                | 0.11  |      | 0.20  | 0.76 | 0.50                      | 0.50 |
| Clearance Time (s)                | 4.0   |      | 4.0   | 5.0  | 5.0                       | 5.0  |
| Vehicle Extension (s)             | 2.0   |      | 2.0   | 4.0  | 4.0                       | 4.0  |
| Lane Grp Cap (vph)                | 202   |      | 356   | 2679 | 1764                      | 764  |
| v/s Ratio Prot                    |       |      | c0.15 | 0.18 | c0.17                     |      |
| v/s Ratio Perm                    | c0.04 |      |       |      |                           | 0.04 |
| v/c Ratio                         | 0.32  |      | 0.74  | 0.24 | 0.33                      | 0.08 |
| Uniform Delay, d1                 | 28.5  |      | 26.2  | 2.5  | 10.5                      | 9.2  |
| Progression Factor                | 1.00  |      | 1.00  | 1.00 | 1.00                      | 1.00 |
| Incremental Delay, d2             | 0.3   |      | 6.8   | 0.2  | 0.5                       | 0.2  |
| Delay (s)                         | 28.8  |      | 33.0  | 2.7  | 11.0                      | 9.4  |
| Level of Service                  | C     |      | C     | A    | B                         | A    |
| Approach Delay (s)                | 28.8  |      |       | 11.5 | 10.8                      |      |
| Approach LOS                      | C     |      |       | B    | B                         |      |
| <b>Intersection Summary</b>       |       |      |       |      |                           |      |
| HCM 2000 Control Delay            |       |      | 11.9  |      | HCM 2000 Level of Service | B    |
| HCM 2000 Volume to Capacity ratio |       |      | 0.43  |      |                           |      |
| Actuated Cycle Length (s)         |       |      | 70.0  |      | Sum of lost time (s)      | 13.0 |
| Intersection Capacity Utilization |       |      | 51.0% |      | ICU Level of Service      | A    |
| Analysis Period (min)             |       |      | 15    |      |                           |      |
| c Critical Lane Group             |       |      |       |      |                           |      |

# HCM Unsignalized Intersection Capacity Analysis

## 3: Project Driveway & Road 20

Existing plus Project Conditions  
Timing Plan: A.M. Peak

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Traffic Volume (veh/h)            | 295                                                                               | 5                                                                                 | 1                                                                                 | 309                                                                               | 14                                                                                | 3                                                                                 |
| Future Volume (Veh/h)             | 295                                                                               | 5                                                                                 | 1                                                                                 | 309                                                                               | 14                                                                                | 3                                                                                 |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 321                                                                               | 5                                                                                 | 1                                                                                 | 336                                                                               | 15                                                                                | 3                                                                                 |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage veh                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              | 482                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   | 0.88                                                                              |                                                                                   | 0.88                                                                              | 0.88                                                                              |
| vC, conflicting volume            |                                                                                   |                                                                                   | 326                                                                               |                                                                                   | 662                                                                               | 324                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 172                                                                               |                                                                                   | 552                                                                               | 170                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.4                                                                               | 6.2                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 100                                                                               |                                                                                   | 97                                                                                | 100                                                                               |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 1242                                                                              |                                                                                   | 437                                                                               | 773                                                                               |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total                      | 326                                                                               | 337                                                                               | 18                                                                                |                                                                                   |                                                                                   |                                                                                   |
| Volume Left                       | 0                                                                                 | 1                                                                                 | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |
| Volume Right                      | 5                                                                                 | 0                                                                                 | 3                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| cSH                               | 1700                                                                              | 1242                                                                              | 471                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Volume to Capacity                | 0.19                                                                              | 0.00                                                                              | 0.04                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 3                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.0                                                                               | 12.9                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Lane LOS                          |                                                                                   | A                                                                                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.0                                                                               | 12.9                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.4                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 27.1%                                                                             | ICU Level of Service                                                              |                                                                                   | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

## Queues

## 1: San Pablo Ave &amp; 23rd St/Road 20

## Existing plus Project Conditions

Timing Plan: P.M. Peak

|                         |  |  |  |  |  |  |  |  |  |  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group              | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Group Flow (vph)   | 288                                                                               | 290                                                                               | 104                                                                               | 135                                                                               | 52                                                                                | 132                                                                               | 754                                                                                | 34                                                                                  | 309                                                                                 | 400                                                                                 |
| v/c Ratio               | 0.73                                                                              | 0.72                                                                              | 0.23                                                                              | 0.60                                                                              | 0.17                                                                              | 0.65                                                                              | 0.65                                                                               | 0.36                                                                                | 0.36                                                                                | 0.50                                                                                |
| Control Delay           | 68.4                                                                              | 67.6                                                                              | 4.2                                                                               | 81.5                                                                              | 1.2                                                                               | 86.7                                                                              | 50.2                                                                               | 93.9                                                                                | 51.3                                                                                | 18.7                                                                                |
| Queue Delay             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay             | 68.4                                                                              | 67.6                                                                              | 4.2                                                                               | 81.5                                                                              | 1.2                                                                               | 86.7                                                                              | 50.2                                                                               | 93.9                                                                                | 51.3                                                                                | 18.7                                                                                |
| Queue Length 50th (ft)  | 307                                                                               | 309                                                                               | 0                                                                                 | 141                                                                               | 0                                                                                 | 138                                                                               | 388                                                                                | 36                                                                                  | 150                                                                                 | 183                                                                                 |
| Queue Length 95th (ft)  | 504                                                                               | 505                                                                               | 24                                                                                | 257                                                                               | 0                                                                                 | #287                                                                              | 551                                                                                | 91                                                                                  | 229                                                                                 | 286                                                                                 |
| Internal Link Dist (ft) |                                                                                   | 368                                                                               |                                                                                   | 330                                                                               |                                                                                   |                                                                                   | 1025                                                                               |                                                                                     | 421                                                                                 |                                                                                     |
| Turn Bay Length (ft)    |                                                                                   |                                                                                   | 135                                                                               |                                                                                   |                                                                                   | 155                                                                               |                                                                                    | 90                                                                                  |                                                                                     | 90                                                                                  |
| Base Capacity (vph)     | 652                                                                               | 667                                                                               | 671                                                                               | 574                                                                               | 576                                                                               | 274                                                                               | 1891                                                                               | 137                                                                                 | 1649                                                                                | 1126                                                                                |
| Starvation Cap Reductn  | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Spillback Cap Reductn   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Storage Cap Reductn     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Reduced v/c Ratio       | 0.44                                                                              | 0.43                                                                              | 0.15                                                                              | 0.24                                                                              | 0.09                                                                              | 0.48                                                                              | 0.40                                                                               | 0.25                                                                                | 0.19                                                                                | 0.36                                                                                |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

Existing plus Project Conditions

1: San Pablo Ave & 23rd St/Road 20

Timing Plan: P.M. Peak

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |  |                                                                                   |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 428                                                                               | 104                                                                               | 96                                                                                | 20                                                                                | 104                                                                               | 48                                                                                | 121                                                                                 | 636                                                                                 | 58                                                                                  | 31                                                                                  | 284                                                                                 | 368                                                                                 |
| Future Volume (vph)               | 428                                                                               | 104                                                                               | 96                                                                                | 20                                                                                | 104                                                                               | 48                                                                                | 121                                                                                 | 636                                                                                 | 58                                                                                  | 31                                                                                  | 284                                                                                 | 368                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 6.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 | 6.0                                                                                 |
| Lane Util. Factor                 | 0.95                                                                              | 0.95                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 0.95                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 0.97                                                                              |                                                                                   | 1.00                                                                              | 0.98                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Flpb, ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              |                                                                                   | 1.00                                                                              | 0.85                                                                              | 1.00                                                                                | 0.99                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     | 0.95                                                                              | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 | 1681                                                                              | 1717                                                                              | 1533                                                                              |                                                                                   | 1848                                                                              | 1553                                                                              | 1770                                                                                | 3479                                                                                |                                                                                     | 1770                                                                                | 3539                                                                                | 1583                                                                                |
| Flt Permitted                     | 0.95                                                                              | 0.97                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 | 1681                                                                              | 1717                                                                              | 1533                                                                              |                                                                                   | 1848                                                                              | 1553                                                                              | 1770                                                                                | 3479                                                                                |                                                                                     | 1770                                                                                | 3539                                                                                | 1583                                                                                |
| Peak-hour factor, PHF             | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 465                                                                               | 113                                                                               | 104                                                                               | 22                                                                                | 113                                                                               | 52                                                                                | 132                                                                                 | 691                                                                                 | 63                                                                                  | 34                                                                                  | 309                                                                                 | 400                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 80                                                                                | 0                                                                                 | 0                                                                                 | 46                                                                                | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 288                                                                               | 290                                                                               | 24                                                                                | 0                                                                                 | 135                                                                               | 6                                                                                 | 132                                                                                 | 754                                                                                 | 0                                                                                   | 34                                                                                  | 309                                                                                 | 400                                                                                 |
| Confl. Peds. (#/hr)               |                                                                                   |                                                                                   | 10                                                                                |                                                                                   |                                                                                   | 3                                                                                 |                                                                                     |                                                                                     | 21                                                                                  |                                                                                     |                                                                                     | 2                                                                                   |
| Confl. Bikes (#/hr)               |                                                                                   |                                                                                   | 1                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     | 1                                                                                   |
| Turn Type                         | Split                                                                             | NA                                                                                | Perm                                                                              | Split                                                                             | NA                                                                                | Perm                                                                              | Prot                                                                                | NA                                                                                  |                                                                                     | Prot                                                                                | NA                                                                                  | pt+ov                                                                               |
| Protected Phases                  | 4                                                                                 | 4                                                                                 |                                                                                   | 8                                                                                 | 8                                                                                 |                                                                                   | 5                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   | 6 4                                                                                 |
| Permitted Phases                  |                                                                                   |                                                                                   | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 34.5                                                                              | 34.5                                                                              | 34.5                                                                              |                                                                                   | 17.9                                                                              | 17.9                                                                              | 16.9                                                                                | 48.9                                                                                |                                                                                     | 6.1                                                                                 | 38.1                                                                                | 72.6                                                                                |
| Effective Green, g (s)            | 34.5                                                                              | 34.5                                                                              | 34.5                                                                              |                                                                                   | 17.9                                                                              | 17.9                                                                              | 16.9                                                                                | 48.9                                                                                |                                                                                     | 6.1                                                                                 | 38.1                                                                                | 72.6                                                                                |
| Actuated g/C Ratio                | 0.23                                                                              | 0.23                                                                              | 0.23                                                                              |                                                                                   | 0.12                                                                              | 0.12                                                                              | 0.11                                                                                | 0.33                                                                                |                                                                                     | 0.04                                                                                | 0.26                                                                                | 0.49                                                                                |
| Clearance Time (s)                | 6.0                                                                               | 6.0                                                                               | 6.0                                                                               |                                                                                   | 6.0                                                                               | 6.0                                                                               | 6.0                                                                                 | 6.0                                                                                 |                                                                                     | 6.0                                                                                 | 6.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 2.0                                                                                 | 5.0                                                                                 |                                                                                     | 2.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 390                                                                               | 398                                                                               | 356                                                                               |                                                                                   | 222                                                                               | 187                                                                               | 201                                                                                 | 1145                                                                                |                                                                                     | 72                                                                                  | 907                                                                                 | 773                                                                                 |
| v/s Ratio Prot                    | c0.17                                                                             | 0.17                                                                              |                                                                                   |                                                                                   | c0.07                                                                             |                                                                                   | c0.07                                                                               | c0.22                                                                               |                                                                                     | 0.02                                                                                | 0.09                                                                                | 0.25                                                                                |
| v/s Ratio Perm                    |                                                                                   |                                                                                   | 0.02                                                                              |                                                                                   |                                                                                   | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.74                                                                              | 0.73                                                                              | 0.07                                                                              |                                                                                   | 0.61                                                                              | 0.03                                                                              | 0.66                                                                                | 0.66                                                                                |                                                                                     | 0.47                                                                                | 0.34                                                                                | 0.52                                                                                |
| Uniform Delay, d1                 | 52.8                                                                              | 52.7                                                                              | 44.5                                                                              |                                                                                   | 62.0                                                                              | 57.7                                                                              | 63.0                                                                                | 42.6                                                                                |                                                                                     | 69.6                                                                                | 45.0                                                                                | 26.0                                                                                |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Incremental Delay, d2             | 6.2                                                                               | 5.6                                                                               | 0.0                                                                               |                                                                                   | 4.7                                                                               | 0.1                                                                               | 5.8                                                                                 | 1.9                                                                                 |                                                                                     | 1.8                                                                                 | 0.5                                                                                 | 1.2                                                                                 |
| Delay (s)                         | 59.0                                                                              | 58.2                                                                              | 44.5                                                                              |                                                                                   | 66.6                                                                              | 57.7                                                                              | 68.8                                                                                | 44.5                                                                                |                                                                                     | 71.4                                                                                | 45.4                                                                                | 27.1                                                                                |
| Level of Service                  | E                                                                                 | E                                                                                 | D                                                                                 |                                                                                   | E                                                                                 | E                                                                                 | E                                                                                   | D                                                                                   |                                                                                     | E                                                                                   | D                                                                                   | C                                                                                   |
| Approach Delay (s)                |                                                                                   | 56.5                                                                              |                                                                                   |                                                                                   | 64.2                                                                              |                                                                                   |                                                                                     | 48.1                                                                                |                                                                                     |                                                                                     | 36.8                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                     | D                                                                                   |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            |                                                                                   |                                                                                   | 48.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | D                                                                                   |
| HCM 2000 Volume to Capacity ratio |                                                                                   |                                                                                   | 0.63                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 148.5                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 59.2%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Queues  
2: El Portal Dr & Road 20

Existing plus Project Conditions  
Timing Plan: P.M. Peak



| Lane Group              | EBL  | NBL  | NBT  | SBT  | SBR  |
|-------------------------|------|------|------|------|------|
| Lane Group Flow (vph)   | 30   | 226  | 737  | 724  | 22   |
| v/c Ratio               | 0.10 | 0.54 | 0.24 | 0.45 | 0.03 |
| Control Delay           | 21.7 | 25.6 | 3.5  | 14.0 | 11.4 |
| Queue Delay             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Total Delay             | 21.7 | 25.6 | 3.5  | 14.0 | 11.4 |
| Queue Length 50th (ft)  | 5    | 36   | 0    | 43   | 1    |
| Queue Length 95th (ft)  | 32   | 190  | 135  | 239  | 21   |
| Internal Link Dist (ft) | 292  |      | 120  | 382  |      |
| Turn Bay Length (ft)    |      | 155  |      |      | 45   |
| Base Capacity (vph)     | 1010 | 802  | 3227 | 2405 | 1048 |
| Starvation Cap Reductn  | 0    | 0    | 0    | 0    | 0    |
| Spillback Cap Reductn   | 0    | 0    | 0    | 0    | 0    |
| Storage Cap Reductn     | 0    | 0    | 0    | 0    | 0    |
| Reduced v/c Ratio       | 0.03 | 0.28 | 0.23 | 0.30 | 0.02 |
| Intersection Summary    |      |      |      |      |      |

# HCM Signalized Intersection Capacity Analysis

## 2: El Portal Dr & Road 20

Existing plus Project Conditions

Timing Plan: P.M. Peak



| Movement                          | EBL   | EBR  | NBL   | NBT  | SBT                       | SBR  |
|-----------------------------------|-------|------|-------|------|---------------------------|------|
| Lane Configurations               |       |      |       |      |                           |      |
| Traffic Volume (vph)              | 28    | 0    | 208   | 678  | 666                       | 20   |
| Future Volume (vph)               | 28    | 0    | 208   | 678  | 666                       | 20   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900  | 1900 | 1900                      | 1900 |
| Total Lost time (s)               | 4.0   |      | 4.0   | 5.0  | 5.0                       | 5.0  |
| Lane Util. Factor                 | 1.00  |      | 1.00  | 0.95 | 0.95                      | 1.00 |
| Frpb, ped/bikes                   | 1.00  |      | 1.00  | 1.00 | 1.00                      | 0.97 |
| Flpb, ped/bikes                   | 1.00  |      | 1.00  | 1.00 | 1.00                      | 1.00 |
| Frt                               | 1.00  |      | 1.00  | 1.00 | 1.00                      | 0.85 |
| Flt Protected                     | 0.95  |      | 0.95  | 1.00 | 1.00                      | 1.00 |
| Satd. Flow (prot)                 | 1770  |      | 1770  | 3539 | 3539                      | 1543 |
| Flt Permitted                     | 0.95  |      | 0.95  | 1.00 | 1.00                      | 1.00 |
| Satd. Flow (perm)                 | 1770  |      | 1770  | 3539 | 3539                      | 1543 |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92  | 0.92 | 0.92                      | 0.92 |
| Adj. Flow (vph)                   | 30    | 0    | 226   | 737  | 724                       | 22   |
| RTOR Reduction (vph)              | 0     | 0    | 0     | 0    | 0                         | 6    |
| Lane Group Flow (vph)             | 30    | 0    | 226   | 737  | 724                       | 16   |
| Confl. Peds. (#/hr)               |       | 6    |       |      |                           | 4    |
| Confl. Bikes (#/hr)               |       |      |       |      |                           | 1    |
| Turn Type                         | Perm  |      | Prot  | NA   | NA                        | Perm |
| Protected Phases                  |       |      | 1     | 6    | 2                         |      |
| Permitted Phases                  | 8     |      |       |      |                           | 2    |
| Actuated Green, G (s)             | 4.2   |      | 12.0  | 39.7 | 23.7                      | 23.7 |
| Effective Green, g (s)            | 4.2   |      | 12.0  | 39.7 | 23.7                      | 23.7 |
| Actuated g/C Ratio                | 0.08  |      | 0.23  | 0.75 | 0.45                      | 0.45 |
| Clearance Time (s)                | 4.0   |      | 4.0   | 5.0  | 5.0                       | 5.0  |
| Vehicle Extension (s)             | 2.0   |      | 2.0   | 4.0  | 4.0                       | 4.0  |
| Lane Grp Cap (vph)                | 140   |      | 401   | 2655 | 1585                      | 691  |
| v/s Ratio Prot                    |       |      | c0.13 | 0.21 | c0.20                     |      |
| v/s Ratio Perm                    | c0.02 |      |       |      |                           | 0.01 |
| v/c Ratio                         | 0.21  |      | 0.56  | 0.28 | 0.46                      | 0.02 |
| Uniform Delay, d1                 | 22.8  |      | 18.1  | 2.1  | 10.1                      | 8.1  |
| Progression Factor                | 1.00  |      | 1.00  | 1.00 | 1.00                      | 1.00 |
| Incremental Delay, d2             | 0.3   |      | 1.1   | 0.1  | 0.3                       | 0.0  |
| Delay (s)                         | 23.1  |      | 19.2  | 2.2  | 10.4                      | 8.2  |
| Level of Service                  | C     |      | B     | A    | B                         | A    |
| Approach Delay (s)                | 23.1  |      |       | 6.2  | 10.4                      |      |
| Approach LOS                      | C     |      |       | A    | B                         |      |
| <b>Intersection Summary</b>       |       |      |       |      |                           |      |
| HCM 2000 Control Delay            |       |      | 8.3   |      | HCM 2000 Level of Service | A    |
| HCM 2000 Volume to Capacity ratio |       |      | 0.46  |      |                           |      |
| Actuated Cycle Length (s)         |       |      | 52.9  |      | Sum of lost time (s)      | 13.0 |
| Intersection Capacity Utilization |       |      | 47.6% |      | ICU Level of Service      | A    |
| Analysis Period (min)             |       |      | 15    |      |                           |      |
| c Critical Lane Group             |       |      |       |      |                           |      |

# HCM Unsignalized Intersection Capacity Analysis

## 3: Project Driveway & Road 20

Existing plus Project Conditions

Timing Plan: P.M. Peak

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |  |
| Traffic Volume (veh/h)            | 209                                                                               | 15                                                                                | 3                                                                                 | 225                                                                               | 9                                                                                 | 2                                                                                 |
| Future Volume (Veh/h)             | 209                                                                               | 15                                                                                | 3                                                                                 | 225                                                                               | 9                                                                                 | 2                                                                                 |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 227                                                                               | 16                                                                                | 3                                                                                 | 245                                                                               | 10                                                                                | 2                                                                                 |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage veh                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              | 410                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   |                                                                                   | 243                                                                               | 486                                                                               | 235                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   |                                                                                   | 243                                                                               | 486                                                                               | 235                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   |                                                                                   | 4.1                                                                               | 6.4                                                                               | 6.2                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   |                                                                                   | 2.2                                                                               | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   |                                                                                   | 100                                                                               | 98                                                                                | 100                                                                               |
| cM capacity (veh/h)               |                                                                                   |                                                                                   |                                                                                   | 1323                                                                              | 539                                                                               | 804                                                                               |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total                      | 243                                                                               | 248                                                                               | 12                                                                                |                                                                                   |                                                                                   |                                                                                   |
| Volume Left                       | 0                                                                                 | 3                                                                                 | 10                                                                                |                                                                                   |                                                                                   |                                                                                   |
| Volume Right                      | 16                                                                                | 0                                                                                 | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| cSH                               | 1700                                                                              | 1323                                                                              | 570                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Volume to Capacity                | 0.14                                                                              | 0.00                                                                              | 0.02                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 0                                                                                 | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 0.1                                                                               | 11.4                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Lane LOS                          |                                                                                   | A                                                                                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 0.1                                                                               | 11.4                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 24.2%                                                                             | ICU Level of Service                                                              |                                                                                   | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

March 4, 2022

Elizabeth Tyler, Planning Manager

**CITY OF SAN PABLO**

13831 San Pablo Avenue

San Pablo, CA 94806

**RE: CULTURAL RESOURCES IDENTIFICATION MEMORANDUM FOR THE 2364 ROAD 20 DEVELOPMENT PROJECT, CITY OF SAN PABLO, CONTRA COSTA COUNTY, CALIFORNIA**

Dear Ms. Tyler:

In support of the 2364 Road 20 Development Project (project), Michael Baker International completed a cultural resources identification study, which includes a Northwest Information Center (NWIC) records search; literature, historical map, and aerial photo review; local historical group consultation; archaeological buried site sensitivity analysis; pedestrian survey; and evaluation of the property for inclusion in the California Register of Historical Resources (California Register). These efforts were completed to determine whether the project could result in significant impacts to historical and archaeological resources as defined by California Environmental Quality Act (CEQA) Section 15064.5. Methods, results, and recommendations are summarized below.

**PROJECT DESCRIPTION**

The project proposes to demolish an existing single-family residence and large shed and construct a new multifamily five-story residential building. The development would include 64 multifamily rental units, a parking garage, surface parking, and parking lifts. San Pablo Creek runs along the southern end of the parcel and no structures will be constructed within a 30-foot setback from the top bank of the creek. Two existing decks on the parcel extend through the setback and over the creek top of the bank. The decks will be removed as part of the project.

**PROJECT AREA**

The project area is identified as the boundaries of Assessor Parcel Number (APN) 416-120-029, 2364 Road 20 in San Pablo, California, and includes the ground-disturbing project activities associated with the demolition of the extant buildings, site preparation, and construction of the new housing development. The project is mapped within *Richmond, California* USGS 7.5-minute topographic quadrangle map Township 1 North, Range 4 West, Section 6 (see **Attachment 1 - Figures**).

## **NATURAL SETTING**

The project area is located on the eastern side of San Pablo Bay, which is part of San Francisco Bay. Most of the San Francisco Bay Area lies to the east of the San Andreas Fault and is underlain by the Franciscan Formation (Graymer, Jones, and Brabb 1994). The Franciscan Formation is an assemblage of sedimentary, volcanic, and metamorphic rocks that formed when the Pacific crustal plate descended beneath the North American plate during the Jurassic and Cretaceous Ages (between 65 and 200 million years ago). San Pablo lies within the Coast Ranges geomorphic province and is characterized by folds, thrusts, and faults that form a series of nearly parallel northwest-trending ridges, interspersed with alluvium-filled valleys. It is traversed by two principal creeks, Wildcat Creek and San Pablo Creek, both of which originate in the ranges to its southeast.

Geologic units underlying the project area are Holocene (Qha) alluvium deposits (11,700 years ago to today [Graymer et al. 2006]). Soils of the entire project area have been mapped as belonging to the Conejo clay loam (NRCS 2022). These are very deep, well-drained soils that formed in alluvium from basic igneous or sedimentary rocks. Conejo soils are on alluvial fans and stream terraces.

The project area is located in a highly urban residential and commercial area, and native vegetation and natural communities are generally absent; however, limited riparian habitat is present along the segment of San Pablo Creek to the south.

## **CULTURAL RESOURCES IDENTIFICATION METHODS**

The methods and results of the NWIC records search, literature, historical map, and aerial photo review, local historical group consultation, archaeological sensitivity analysis, pedestrian survey, and California Register evaluation are presented below.

### **NORTHWEST INFORMATION CENTER**

NWIC staff conducted a cultural resources records search (File No. 21-1074) of the project area and a half-mile search radius on February 7, 2022. The NWIC, as part of the California Historical Resources Information System, Sonoma State University, Rohnert Park, an affiliate of the California Office of Historic Preservation (OHP), is the official state repository of cultural resources records and reports for Contra Costa County. As part of the records search and background research, the following federal and California inventories were reviewed:

- National Register of Historic Places (National Register) (National Park Service 2022)
- California Points of Historical Interest (OHP 2022a)
- California Historical Landmarks (OHP 2022a)
- Archaeological Determinations of Eligibility (OHP 2012)
- California Inventory of Historic Resources (1976)

**MICHAEL BAKER INTERNATIONAL****CULTURAL RESOURCES IDENTIFICATION MEMORANDUM FOR THE 2364 ROAD 20 DEVELOPMENT PROJECT, CITY OF SAN PABLO, CONTRA COSTA COUNTY, CALIFORNIA****Page 3**

- Built Environment Resources Directory for Contra Costa County (OHP 2022b). The directory includes resources reviewed for eligibility for the National Register and the California Historical Landmarks programs through federal and state environmental compliance laws, and resources nominated under federal and state registration programs, including the National Register, California Register, California Historical Landmarks, and California Points of Historical Interest.

**Results**

No cultural resources were identified within the project area; 13 were identified within the half-mile search radius of the project area as described below:

| <b>Primary/<br/>Trinomial No.</b> | <b>Address</b>       | <b>Type/Name</b>                               | <b>OHP Status Code/<br/>Eligibility Status</b>                                                                                                                                | <b>Proximity to<br/>Project Site</b> |
|-----------------------------------|----------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| P-07-000074/ CA-CCO-000132        | N/A                  | Prehistoric site                               | None                                                                                                                                                                          | Within 0.4 miles                     |
| P-07-000151/ CA-CCO-000272        | N/A                  | Protohistoric site                             | None                                                                                                                                                                          | Within 0.5 miles                     |
| P-07-000466/ CA-CCO-000357        | N/A                  | Prehistoric site                               | None                                                                                                                                                                          | Within 0.5 miles                     |
| P-07-000467/ CA-CCO-000358H       | 1521 Brookside Drive | Historic/Pump house                            | None                                                                                                                                                                          | Within 0.5 miles                     |
| P-07-001182                       | 1825 Church Lane     | Historic/St. Pauls Catholic Church & Graveyard | 7N – Needs to be reevaluated - formerly coded as may become NR eligible with specific conditions.                                                                             | Within 0.5 miles                     |
| P-07-001183                       | 2650 Market Avenue   | Historic/1906 Earthquake Refugee Camp          | 4 – Might become eligible for listing on the National Register (Updated to: 7N – Needs to be reevaluated - formerly coded as may become NR eligible with specific conditions) | Within 0.5 miles                     |

**MICHAEL BAKER INTERNATIONAL****CULTURAL RESOURCES IDENTIFICATION MEMORANDUM FOR THE 2364 ROAD 20 DEVELOPMENT PROJECT, CITY OF SAN PABLO, CONTRA COSTA COUNTY, CALIFORNIA**

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| Primary/<br>Trinomial No. | Address                                      | Type/Name                                                                | OHP Status Code/<br>Eligibility Status                                                                                                  | Proximity to<br>Project Site |
|---------------------------|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| P-07-001190               | 14006 San Pablo Ave                          | Single-family residence/<br>Mello Residence                              | 7R – Identified in reconnaissance level survey or in an area of potential effect:<br>Not evaluated.                                     | Within 0.3 miles             |
| P-07-001192               | 1901 Church Lane                             | Historic/Old Rectory                                                     | 2S2– Individually determined eligible for National Register by consensus through Section 106 process. Listed in the California Register | Within 0.5 miles             |
| P-07-002678               | 13613 San Pablo Avenue                       | Historic district/Circle S Mobile Home Park                              | No longer extant                                                                                                                        | Within 0.5 miles             |
| P-07-002680               | 13685 San Pablo Avenue                       | Historic/San Pablo Redevelopment Agency Warehouse                        | No longer extant                                                                                                                        | Within 0.5 miles             |
| P-07-002681               | 2842, 2846, 2850, 2856, 2864 Chattleton Lane | Historic/Chattleton Housing District                                     | Ineligible for the National and California Registers                                                                                    | Within 0.5 miles             |
| P-07-002753               | 2600 Castro Road                             | Historic/Colonial Hunter Hall USAR Center                                | 6Z – Found ineligible for the National Register, California Register or local designation through survey evaluation                     | Within 0.5 miles             |
| P-07-004534               | N/A                                          | Prehistoric, Protohistoric/Lower San Pablo Creek Archaeological District | 2S2– Individually determined eligible for National Register by consensus through Section 106 process. Listed in the California Register | Within 0.5 miles             |

No cultural resources studies have been previously completed within the project area; 45 have been completed within the half-mile search radius, summarized below.

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| Report No. | Author(s)                                                                     | Date | Report Title                                                                                                                                                                        |
|------------|-------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S-000871   | Bank, Peter, David<br>A. Fredrickson, Lai-<br>Ning Lee, and Susan<br>McMurray | 1977 | <i>Cultural Resource Survey of the Wildcat and San Pablo<br/>Creeks Water Resources Project, Contra Costa County,<br/>California</i>                                                |
| S-001248   | Ananian, Benjamin<br>F.                                                       | 1977 | <i>An Archaeological Field Survey, San Pablo Avenue<br/>Widening, San Pablo, California</i>                                                                                         |
| S-001254   | Parkman, E. Breck                                                             | 1978 | <i>Archaeological Assessment of the Senior Citizen's Center<br/>and Sear's Building Site, San Pablo, California</i>                                                                 |
| S-001295   | Ananian, Benjamin<br>F., Joseph S.<br>Eisenlauer, and<br>George R. Miller     | 1978 | <i>Archeological Testing for the Proposed San Pablo Avenue<br/>Widening Project, San Pablo, California</i>                                                                          |
| S-001610   | Banks, Peter M.                                                               | 1979 | <i>An Archaeological Investigation of a Parcel on El Portal<br/>Drive, San Pablo, Contra Costa County, California</i>                                                               |
| S-001718   | Banks, Peter M.                                                               | 1979 | <i>An Archaeological Investigation of the Baaba Project, San<br/>Pablo, Contra Costa County, California</i>                                                                         |
| S-001719   | Banks, Peter M.                                                               | 1979 | <i>An Archaeological Investigation of the Central Addition to<br/>El Portal Redevelopment Project, San Pablo, Contra Costa<br/>County, California</i>                               |
| S-001768   | Banks, Peter M. And<br>Robert I. Orlins                                       | 1979 | <i>Final Report of the Testing of Cultural Resources within the<br/>Wildcat and San Pablo Creeks Flood Control and Water<br/>Resources Project, Contra Costa County, California</i> |
| S-005661   | Wiberg, Randy S.                                                              | 1982 | <i>An Archaeological Evaluation of Subdivision 6190, City of<br/>San Pablo (letter report)</i>                                                                                      |
| S-005661a  | Holman, Miley Paul                                                            | 1982 | <i>Further Archaeological Auger Boring Inside the Area of<br/>Subdivision 6190 (letter report)</i>                                                                                  |
| S-006614   | Banks, Peter                                                                  | 1984 | <i>Subsurface Archaeological Investigations at Subdivision<br/>6367, Road 20, San Pablo, Contra Costa County, California</i>                                                        |
| S-007286   | Cartier, Robert                                                               | 1985 | <i>Cultural Resource Evaluation of the El Portal Shopping<br/>Center/Road 20 Improvement Project in the City of San<br/>Pablo, County of Contra Costa</i>                           |
| S-011056   | Peron, Rene                                                                   | 1989 | <i>An Archaeological Investigation of the E.A.H. Church Lane<br/>Senior Housing, 1924-1928 Church Lane, San Pablo, Ca</i>                                                           |
| S-018038   | Holman, Miley Paul                                                            | 1994 | <i>Mechanical Subsurface Testing for Cultural Resources at<br/>the Proposed Church Lane Apartment Project Area, San<br/>Pablo, Contra Costa County, California (letter report)</i>  |

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| Report No. | Author(s)                           | Date | Report Title                                                                                                                                                                                                                                                           |
|------------|-------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S-019741   | Gause, Seana L. S.                  | 1997 | <i>An Archaeological Survey Report for the Bridge Widening on Rumrill Boulevard, San Pablo, Contra Costa County, California</i>                                                                                                                                        |
| S-029696   | Kelley, John and Benjamin Matzen    | 2004 | <i>A Cultural and Paleontological Resources Study for the Circle S Housing Development Project, San Pablo, Contra Costa County, California.</i>                                                                                                                        |
| S-031068   | Billat, Scott                       | 2005 | <i>Collocation ("CO") Submission Packet, FCC Form 621, El Portal, CA-4056B</i>                                                                                                                                                                                         |
| S-033596   | Maniery, Mary L. and Cindy L. Baker | 2007 | <i>Cultural Resource Inventory and Evaluation of United States Army Reserve 63D Regional Readiness Command Facilities; Contract No. W912C8-05-P-0052</i>                                                                                                               |
| S-033596a  | Maniery, Mary L. and Cindy L. Baker | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve Heroic War Dead USAR Center/Area Maintenance Support Activity 85 (G), Oakland, California; P-01-[010831], 63D Regional Readiness Command Facility CA036, Contract No. W912C8-05-P</i> |
| S-033596b  | Maniery, Mary L. and Cindy L. Baker | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve Oakland USAR Center #2, Oakland, California; P-01-01830, 63D Regional Readiness Command Facility CA-125, Contract No. W912C8-05-P-0052</i>                                            |
| S-033596c  | Maniery, Mary L. and Cindy L. Baker | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve PFC Bacciglieri Armed Forces Reserve Center, Concord, California; P-07-002752, 63 D Regional Readiness Command Facility CA007, Contract No. W912C8-P-0052</i>                         |
| S-033596d  | Maniery, Mary L. and Cindy L. Baker | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve Col. Hunter Hall USAR Center, San Pablo, California; P-07-002753, 63D Regional Readiness Command Facility CA 070, Contract No. W912C8-05-P-0052</i>                                   |
| S-033596e  | Maniery, Mary L. and Cindy L. Baker | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve Fort Ord USAR Center, Marina, California; 63D Regional Readiness Command Facility CA012, Contract No. W912C8-05-P-0052</i>                                                            |

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| Report No. | Author(s)                                      | Date | Report Title                                                                                                                                                                                                                      |
|------------|------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S-033596f  | Maniery, Mary L. and Cindy L. Baker            | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve Moss Landing Local Training Area, Moss Landing, California; 63D Regional Readiness Command Facility CA189, Contract No. W912C8-05-P-0052</i>     |
| S-033596g  | Maniery, Mary L. and Cindy L. Baker            | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve Jones Hall USAR Center, Mountain View, California; P-43-001836, 63D Regional Readiness Command Facility CA031, Contract No. W912C8-05-P-0052</i> |
| S-033596h  | Maniery, Mary L. and Cindy L. Baker            | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve Richey Hall USAR Center, San Jose, California; P-43-000728, 63D Regional Readiness Command Facility CA069, Contract No. W912C8-05-P-0052</i>     |
| S-033596i  | Maniery, Mary L. and Cindy L. Baker            | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve Moffett USAR Center, Mountain View, California; P-43-001837, 63D Regional Readiness Command Facility CA120, Contract No. W912C8-05-P-0052</i>    |
| S-033596j  | Maniery, Mary L. and Cindy L. Baker            | 2007 | <i>Cultural Resources Inventory and Evaluation of the United States Army Reserve PFC Young USAR Center, Vallejo, California; P-[48-000752], 63D Regional Readiness Command Facility CA-090, Contract No. W912C8-05-P-0052</i>     |
| S-033596k  | Milford, Wayne Donaldson and James O. Anderson | 2007 | <i>USA070613A; Inventory and Evaluation of Historic Resources at 63D Regional Readiness Command, US Army Reserve Center in California</i>                                                                                         |
| S-035030   | Dexter, Sean                                   | 2008 | <i>Archaeological Survey Report for Davis Park, City of San Pablo, Contra Costa County, California (letter report)</i>                                                                                                            |
| S-035664   | Jones, E. Timothy and Michael Hibma            | 2008 | <i>A Cultural and Paleontological Resources Study for the Contra Costa College Facilities Master Plan Project, San Pablo, Contra Costa County, California</i>                                                                     |
| S-038230   | Butt, Kimberly                                 | 2011 | <i>Historic Resources Evaluation, 1901 Church Lane, San Pablo, California</i>                                                                                                                                                     |

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| Report No. | Author(s)                                | Date | Report Title                                                                                                                                                                                                                              |
|------------|------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S-038230a  | Stratton, Susan K. and Robert T. Calkins | 2011 | <i>DOE110103A: Section 106 for Energy Upgrades, 1901 Church Lane, San Pablo, CA</i>                                                                                                                                                       |
| S-040631   | Koenig, Heidi                            | 2013 | <i>West of Hills Northern Pipelines Project, East Bay Municipal Utility District, Contra Costa and Alameda Counties, Cultural Resources Survey Report</i>                                                                                 |
| S-040631a  | Koenig, Heidi                            | 2019 | <i>Supplement to the Cultural Resources Study for the East Bay Municipal Utility District, Wildcat Pipeline Improvement Project, El Cerrito</i>                                                                                           |
| S-043442a  | Clark, Matthew R                         | 2013 | <i>Rumrill Boulevard Bridge Replacement Project Final Report, Section 1: Archaeological Testing and Evaluation, Monitoring of Construction and Data Recovery, Completion of National Historic Preservation Act Section 106 Compliance</i> |
| S-043442   | Sunshine, Psota                          | 2013 | <i>Section II: Rumrill Historic and Recent Artifacts</i>                                                                                                                                                                                  |
| S-046251   | Cross, Michelle C.                       | 2015 | <i>Cultural Resources Inventory, Extended Phase I Testing (XPI) and Evaluation Report for the Laurel Terrace Development Project, San Pablo, Contra Costa County, California (FINAL)</i>                                                  |
| S-046251a  | Cross, Michelle C.                       | 2015 | <i>Amendment 1 to the Cultural Resources Inventory, Extended Phase I Testing (XPI) and Evaluation Report for the Laurel Terrace Development Project, San Pablo, Contra Costa County, California (FINAL)</i>                               |
| S-046251b  | Roland-Nawi, Carol and Kristin Sherk     | 2015 | <i>HUD 2015_0316_007: Multifamily Development Project Located at Southeast Corner San Pablo Avenue/Church Lane, San Pablo</i>                                                                                                             |
| S-047514   | Dang, Darryl                             | 2014 | <i>Cultural Resources Constraints Report, Gas Main Standard &amp; Mason, San Pablo, Contra Costa County, PM Number 30968147</i>                                                                                                           |
| S-047514a  | Brandon Patterson                        | 2016 | <i>Archaeological Monitoring Summary Report for 30968147 Gas Main Standard &amp; Mason, San Pablo, Contra Costa County (letter report)</i>                                                                                                |
| S-049682   | Polanco, Julianne, Laura M. Caballero,   | 2017 | <i>Colonel Hunter Hall, United States Army Reserve Center, Facility ID No. CA070</i>                                                                                                                                                      |

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| Report No. | Author(s)                                                    | Date | Report Title                                                                                                                                                  |
|------------|--------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | and Susan K. Stratton                                        |      |                                                                                                                                                               |
| S-049682a  | Polanco, Julianne, Laura M. Caballero, and Susan K. Stratton | 2017 | <i>USA_2017_0206_002, Real Property Exchange of Hunter Hall Army Reserve Center, 2600 Castro Road, San Pablo, California</i>                                  |
| S-050069   | Alonso, Christina, Stacy Kozakavich, and Nazih Fino          | 2018 | <i>Cultural Resources Assessment Report, Wildcat Creek Restoration and Greenway Trail, San Pablo, California, Project Number 17-365, Report Number 17-394</i> |

**LITERATURE, HISTORICAL MAP, AND AERIAL PHOTOGRAPH REVIEW**

Michael Baker staff reviewed literature, historical maps, and aerial photographs for historical information about the project area and the vicinity. Below is a list of resources reviewed, followed by a narrative description of the results:

- "Cultural Diversity in Early Central California: A View from the North Coast Ranges" (Fredrickson 1974)
- *Archaeological Survey Report for the Rumrill Boulevard Complete Streets Project* (Jordan and Nayyar 2017)
- *California Archaeology* (Moratto 1984)
- *Final Report of the Testing of Cultural Resources within the Wildcat and San Pablo Creeks Flood Control and Water Resources Project, Contra Costa County, California* (Banks and Orlins 1979)
- Survey Plat Map of Township No. 1 North, Ranch No. 4 West, Mount Diablo Meridian (Bureau of Land Management General Land Office [BLM] 1867)
- Richmond, Calif. 1:24,000 scale topographic quadrangle (US Geological Survey [USGS] 1947)
- Richmond, Calif. 1:24,000 scale topographic quadrangle (USGS 1949)
- Richmond, Calif. 1:24,000 scale topographic quadrangle (USGS 1952)
- Richmond, Calif. 1:24,000 scale topographic quadrangle (USGS 1960)
- Aerial photograph: Flight BUU-1958, Frame 12V-82 (University of California, Santa Barbara [UCSB] 1959)
- Aerial photograph: Flight CAS-65-130, Frame 15-35 (UCSB 1965)
- Aerial photograph: Flight GS-VEZR, Frame 1-11 (UCSB 1980)
- Aerial photograph: Flight NAPP-2C, Frame 6365-88 (UCSB 1988)
- *Contra Costa Times* (2005)
- *San Pablo, California* Sanborn Map, June 1928 (Sanborn Map Company 1928 )
- *Planning, Current Literature* (U.S. Department of Commerce Bureau of Public Roads 1957)

- 1939 aerial imagery (Google Earth, n.d.)

## **Results**

The Paleo-Archaic-Emergent chronological sequence of the San Francisco Bay region consists of three broad periods (Fredrickson 1974): the Paleo-Indian period (10,000–6,000 B.C.); the Archaic period consisting of the Lower Archaic (6,000–3,000 BC), Middle Archaic (3,000–1,000 BC, and Upper Archaic (1,000 BC–AD 500); and the Emergent period (AD 500–1800). The cultural patterns relevant to the project area include the Berkeley Pattern during the Archaic period (1,000 BC–AD 500) and Augustine Pattern (AD 500–1800).

The Berkeley Pattern is characterized by deeply stratified midden deposits containing diverse tools, large assemblages of milling and grinding stones for the processing of plant resources, distinctive diagonal flaking projectile points, flexed position burials with burial ornaments such as shell beads, and extensive bone tools. The Augustine Pattern is characterized by intensive hunting, fishing, and gathering; a focus on acorn processing; large population increases; intensified trade and exchange networks; more complex ceremonial and social attributes; and the practice of cremation in addition to flexed burials. The Augustine Pattern and the Historic period can be characterized as the apex of Native American cultural development in this part of California (Jordan and Nayyar 2017).

The project area is located within the historical territory of the Huchiun Indians, speakers of the Costanoan/Ohlone language (Spanish for “coastal” people). The Huchiun inhabited the San Pablo–Richmond area, or a stretch of approximately 4 miles extending from north of San Pablo Creek to Cerrito Creek (Banks and Orlins 1979). Ethnographic information suggests that at historic contact, a village on San Pablo or Wildcat Creek was occupied in the spring, a season when plant foods found on the alluvial plain and foothill woodland were extensively collected. Prehistoric sites in the Huchiun tribelet area were almost always situated at or near the transition between ecological zones. These transitional zones, or ecotones, were so favorable for human habitation that prehistoric sites tended to cluster near or at them. Generally, the distribution of cultural resources in the Huchiun tribelet area suggests that groups of sites would most likely be found near or at transitions between ecological zones, and near-permanent sources of freshwater (Banks and Orlins 1979).

The 1867 BLM GLO survey plat depicts the project area as located within the lands of Rancho San Pablo, although no details were mapped for the area (BLM 1867). A 1939 aerial photograph shows the property was undeveloped, and the neighboring parcels to the east and north were sparsely developed and appear to have supported agricultural uses (Google Earth, n.d.).

During World War II, the agricultural land across Road 20 to the north was developed with a temporary defense workers’ housing project called El Portal Park. That property was later redeveloped, with portions used to build a shopping center, tract homes, and Contra Costa Community College (San Pablo Historical and Museum Society 2021; USGS 1960; U.S. Department

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of Commerce, Bureau of Public Roads 1957). In addition, the alignment of Road 20 near its intersection with San Pablo Avenue was modified throughout the decades (USGS 1947, 1949, 1952; UCSB 1959, 1965, 1980, 1988).

USGS topographic quadrangle maps show the project area was developed with several buildings sited parallel to Road 20 as early as 1947. The county assessor's data for the extant building on the property indicates it was constructed in 1943 (ParcelQuest Lite 2022). By 1952, the subject property was in use as a nursery (*Contra Costa Times* 2005). Aerial photographs appear to show several buildings on the property sited parallel to the road through about 1980. The western side of the property was cleared of structures by the late 1980s. The property was sold and ceased being used as a nursery in approximately the late 2000s (Sullivan 2007; Bennett 2008).

### **LOCAL HISTORICAL GROUP CONSULTATION**

Michael Baker International prepared a letter and figures describing the project, and sent a copy via email to the San Pablo Historical and Museum Society on January 18, 2022. The letter requested information or concerns regarding historical resources within the project area (**Attachment 2**). Janet Pottier, president of the San Pablo Historical and Museum Society, responded on January 31, 2022, via email with information regarding the project area and surrounding area. Ms. Pottier stated she was not aware of any historical significance of the property, but she knew the property operated as Ken's Nursery. She relayed that owner Ken Tokuyoshi was of Japanese descent and was interned by the U.S. government during World War II, but was able to reestablish his business after the war. She stated the nursery business was in operation through at least the 1990s. Ms. Pottier also stated she was aware of significant and large amounts of Native American artifacts and human remains found along San Pablo Creek. She provided two locations of previous archaeological finds, both within 0.5 miles of the project area. Although Ms. Pottier provided property names and addresses, that information is omitted here for confidentiality reasons.

On February 17, 2022, Michael Baker International emailed Ms. Pottier to inquire if she had additional information regarding other possible locations for the Ken's Nursery business. No reply has been received as of the date of this memorandum.

### **FIELD SURVEY**

On February 1, 2022, Michael Baker International archaeologist Jacob Parsley conducted a pedestrian survey of the project area. The exposed ground surface was walked over in single transects spaced approximately 15 meters apart. The north half of the parcel along Road 20 is developed and includes a house with an attached deck that extends south toward San Pablo Creek, a large shed at the northeast corner of the parcel, and a smaller deck at the southeastern edge of the parcel. A paved area on the western half of the parcel is used as a parking lot. The majority of exposed ground surface was either paved or graveled with no visible exposed native soils. The south half of the project area along San Pablo Creek was heavily obscured with

vegetation with no visible or exposed soils. Disturbances include landscaping, grading, bioturbation, human habitation/camping, and modern refuse dumping. No cultural materials or anthropogenic soils were identified within the project area during the survey.

During the field effort, Michael Baker International conducted a survey of the property to assess the existing buildings and note their current condition, construction, materials, and any alterations to the buildings. Documentation included photographs and field notes, and photographs were incorporated into the California Department of Parks and Recreation (DPR) 523 series forms in **Attachment 3**.

### **ARCHAEOLOGICAL BURIED SITE SENSITIVITY ANALYSIS**

Sensitivity for cultural resources consisting of archaeological sites is considered moderate based upon the known cultural resources in the vicinity of the project, the shallow previous disturbance in the project area, and various natural factors discussed below.

The project area is located adjacent to (on the north bank of ) San Pablo Creek. Proximity to water, a critical resource, indicates a greater sensitivity of prehistoric occupation. Additionally, it is underlain by Holocene-age young alluvium (11,700 years ago to today). These deposits have the potential for capping prehistoric archaeological deposits.

The NWIC records search results and the field survey identified no cultural resources within the project area. However, five prehistoric archaeological sites, including the National Register-eligible Lower San Pablo Creek Archaeological District (P-07-004534), were identified within a half-mile to the west of the project area. Archaeological excavation at sites within the district documented historical and recent cultivation activities, and industrial and housing development has altered the surface and near-surface cultural deposits. However, intact midden deposits were present below 2 feet to 8 feet below the ground surface. During prehistoric and historic times, the Lower San Pablo Creek Archaeological District area was prone to flooding and archaeological sites in the district are known to contain surficial and buried deposits.

The project area was developed in 1943 and used as a nursery through the 2000s. Nurseries typically have shallow ground disturbance for the construction of greenhouses and would likely have added soil and manure over the life of the nursery to facilitate growing conditions. This would have led to an accumulating soil environment which would have capped subsurface archaeological deposits. According to the historical map review, the project area was first developed in 1943. Additionally, aerial photographs appear to show several buildings on the property sited parallel to the road through about 1980.

The sensitivity for the project area is moderate based upon the number of previously documented sites in the project vicinity, the accumulating soil environment, and the likely shallow ground disturbance from previous construction. The project area has moderate sensitivity for buried

significant or potentially significant prehistoric or historic-period archaeology sites as a result of historic and modern development.

### **CALIFORNIA REGISTER EVALUATION**

A description and history of the property at 2364 Road 20 are included in the DPR forms in **Attachment 3**. Below is a summary of the evaluation of the property for eligibility for listing in the California Register.

**Criterion 1** – The property at 2364 Road 20 functioned as a nursery from 1952 to approximately the late 2000s. Archival research did not indicate the property is associated with any significant events or trends in national, state, regional, or local history. While it is generally associated with post-World War II commercial development, the property did not play an important role in the history of commercial development in San Pablo, and is not significant within this context. Thus, it is recommended ineligible under Criterion 1.

**Criterion 2** – While the property at 2364 Road 20 is associated with Kenichi (Ken) and Alice Tokuyoshi, business owners who successfully operated a nursery at the property between 1952 and approximately 2008, archival research did not demonstrate they made significant contributions to national, state, or local history. Therefore, the property is recommended ineligible under Criterion 2.

**Criterion 3** – The extant residence on the property is suggestive of Minimal Traditional residential architecture, having been built during the period that the style was popular. However, the residence is comparatively large and has a more complex plan and roofline than is the norm for Minimal Traditional style homes. Therefore, it is not a good representative example of the style, or any other architectural style. The shed on the property is utilitarian. It is not representative of any particular architectural style, and displays modest and common building materials and features. Thus, while building permit records consulted for this study did not identify an architect or builder, it is unlikely the residence or shed was designed by a master architect or builder. In addition, two structures associated with the nursery have been demolished or removed from the property, and the residence has undergone various alterations between the time of its original construction through 1995, including an addition near the southwest end of the building, sheds attached to the east side of the building, and a large deck added to the rear of the building. The buildings on the property do not embody the distinctive characteristics of a type, period, region, or method of construction, nor do they represent the work of a master, or possess high artistic values. Thus, the property is recommended ineligible under Criterion 3.

**Criterion 4** – Available information does not indicate the buildings or property have the potential to yield information important to the prehistory or history of the community, state, or nation; therefore, the property is recommended ineligible under Criterion 4.

## **FINDINGS AND RECOMMENDATIONS**

No historical or archaeological resources as defined by CEQA Section 15064.5(a) were identified within the project area as a result of the NWIC records search, literature, map, and aerial photo review, historical society consultation, pedestrian survey, and California Register evaluation.

Sensitivity for buried archaeological resources is moderate. There is a potential for disturbing previously unknown archaeological resources during ground-disturbing activities associated with project construction.

Impacts will be avoided through implementation of the following City policies (OSC-1-15 and OSC-1-16), designed to protect known and unknown cultural resources in San Pablo as described in the San Pablo General Plan (City of San Pablo 2011):

**OSC-1-15:** Help to ensure that new development analyzes and avoids potential impacts to historic, archaeological resources by:

- Requiring a records review for development proposed in areas that are considered archaeologically or paleontologically sensitive;
- **Requiring pre-construction surveys and monitoring during any ground disturbance for all development in areas of historic or archaeological sensitivity;**
- Implementing appropriate measures as a condition of project approval—measures such as avoidance, preservation in place, excavation, documentation, and/or data recovery—in order to avoid any identified cultural resource impacts.

*In the event that historical, archaeological, or paleontological resources are accidentally discovered during construction, grading activity in the immediate area shall cease and materials and their surroundings shall not be altered or collected. A qualified archaeologist or paleontologist must make an immediate evaluation and avoidance measures, or appropriate mitigation should be completed, according to CEQA Guidelines. The State Office of Historic Preservation has issued recommendations for the preparation of Archaeological Resource Management Reports that may be used as guidelines.*

**OCS-1-16:** Work with local Native American tribes to protect recorded and unrecorded cultural and sacred sites, and **to educate developers and the community-at-large about the connections between Native American history and the environmental features that characterize the local landscape.**

*Native American cultural resources in the Planning Area have been found near sources of water including perennial and intermittent streams and springs, on midslope terraces and elevated knolls above the floodplain, and near ecotones and other productive environments. There is a high likelihood that additional unrecorded Native American cultural sites also exist in the Planning Area.*

Applicable state and federal laws include California Health and Safety Code Sections 7050.5-7055, and Section 5097.98 of the California Public Resources Code.

## **PREPARER QUALIFICATIONS**

This memorandum was prepared by Michael Baker International Senior Archaeologist Kholood Abdo, MA, RPA and Senior Architectural Historian Susan Zamudio-Gurrola, MHP. Archaeologist Jacob Parsley conducted the field survey and Senior Cultural Resources Manager Margo Nayyar reviewed the document for quality control and assurance.

**Kholood Abdo, Senior Archaeologist**, is an archaeologist with 26 years of experience in prehistoric and historical archaeology and cultural resources management. Her experience includes writing technical reports, including National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), and CEQA compliance documents. She has supervised and managed all phases of archaeological fieldwork, including survey, Phase II testing and evaluations and data recovery, and monitoring at sites throughout California and Arizona since 1999. In her current capacity as senior archaeologist and laboratory director, Ms. Abdo oversees the processing, analysis, and curation of artifact collections from both prehistoric and historical sites. Her cultural material analysis experience includes flaked and ground stone lithics, glass, prehistoric and historic ceramic, and bead analysis. Ms. Abdo meets the Secretary of the Interior's Professional Qualification Standards for prehistory and historical archaeology.

**Susan Zamudio-Gurrola, Senior Architectural Historian**, is an architectural historian with over eight years of experience in cultural resource management. Her experience includes conducting archival research and built environment surveys, conducting evaluations for the National and California Registers and local designations, assessing the integrity of historic resources, developing historic context statements, reviewing projects for conformance with the Secretary of the Interior's Standards, and preparing cultural resources studies in compliance with CEQA, NEPA, Section 106 of the NHPA, and local ordinances. She also prepares cultural resources sections for CEQA environmental documents such as initial studies and environmental impact reports, and has demonstrated experience preparing Caltrans-format cultural resources studies, finding of effect documents, and Historic American Buildings Survey/Historic American Engineering Record documentation for buildings and structures. Ms. Zamudio-Gurrola meets the Secretary of the Interior's Professional Qualification Standards for history and architectural history.

**Jacob Parsley, Archaeologist**, has worked in various capacities in cultural resource management since 2018. He is experienced in surveying, monitoring, and writing cultural resources constraints reports. Mr. Parsley is versed in conducting fieldwork within the frameworks of Section 106 of the NHPA, NEPA, and CEQA. He has participated in projects in several phases of archaeology: Phase I pedestrian and shovel test surveys, buried site testing, Phase III data recovery, and Phase IV monitoring. His project highlights include archaeological surveying to update and verify cultural resources found mostly in remote areas of California, many of which have included prehistoric components. Other project responsibilities include identifying and flagging historic and

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**CULTURAL RESOURCES IDENTIFICATION MEMORANDUM FOR THE 2364 ROAD 20 DEVELOPMENT PROJECT, CITY OF SAN PABLO, CONTRA COSTA COUNTY, CALIFORNIA**

**Page 16**

prehistoric resources, delineating best access routes and conducting post impact assessments, and reporting to the National Park Service, National Forest System, California State Parks, PG&E, and private clients.

**Margo Nayyar, Senior Cultural Resources Manager**, is a senior architectural historian with 12 years of cultural management experience in California, Nevada, Arizona, Idaho, Texas, and Mississippi. Her experience includes built environment surveys, evaluation of historic-era resources using guidelines outlined in the National and California Registers, and preparation of cultural resources technical studies pursuant to CEQA and Section 106 of the NHPA, including identification studies, finding of effect documents, memorandum of agreements, programmatic agreements, and Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscapes Survey mitigation documentation. She prepares cultural resources sections for CEQA environmental documents, including infill checklists, initial studies, and environmental impact reports, as well as NEPA environmental documents, including environmental impact statements and environmental assessments. She also specializes in municipal preservation planning, historic preservation ordinance updates, Native American consultation, and provision of Certified Local Government training to interested local governments. She develops Survey 123 and Esri Collector applications for large-scale historic resources surveys, and authors National Register nomination packets. Ms. Nayyar meets the Secretary of the Interior's Professional Qualification Standards for history and architectural history.

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**CULTURAL RESOURCES IDENTIFICATION MEMORANDUM FOR THE 2364 ROAD 20 DEVELOPMENT**  
**PROJECT, CITY OF SAN PABLO, CONTRA COSTA COUNTY, CALIFORNIA**  
**Page 17**

Sincerely,



Kholood Abdo, RPA  
Senior Archaeologist



Susan Zamudio-Gurrola, MHP  
Senior Architectural Historian

Attachments:

**Attachment 1** – Figures

**Attachment 2** – Local Historical Group Consultation

**Attachment 3** – DPR 523 series forms

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**CULTURAL RESOURCES IDENTIFICATION MEMORANDUM FOR THE 2364 ROAD 20 DEVELOPMENT**  
**PROJECT, CITY OF SAN PABLO, CONTRA COSTA COUNTY, CALIFORNIA**  
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**PROJECT, CITY OF SAN PABLO, CONTRA COSTA COUNTY, CALIFORNIA**  
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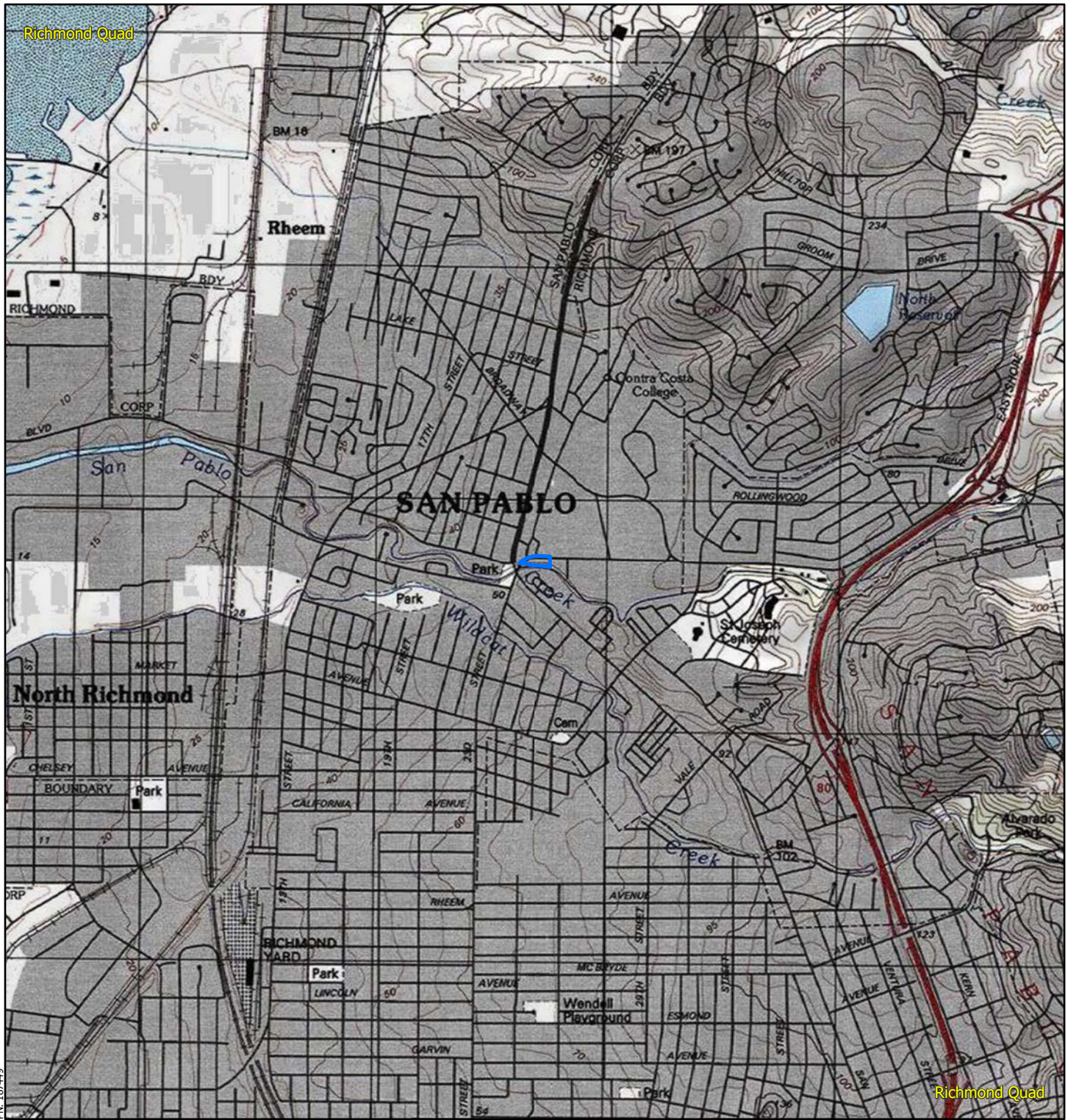
# **Attachment 1**

## **Figures**



Project Location





 Project Area



PN: 187449



Project Area



# **Attachment 2**

## **Local Historical Group Consultation**

January 28, 2022

**SAN PABLO HISTORICAL SOCIETY**

1 Alvarado Square

San Pablo, CA 94806

Via email: [sanpablomuseums@gmail.com](mailto:sanpablomuseums@gmail.com)

**RE: 2364 ROAD 20 DEVELOPMENT PROJECT, CITY OF SAN PABLO, CONTRA COSTA COUNTY, CALIFORNIA**

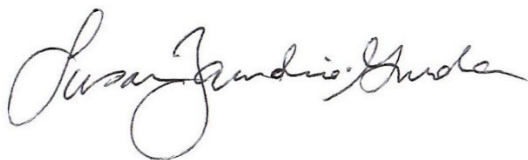
To Whom it May Concern:

Michael Baker International is conducting a cultural resources investigation for the 2364 Road 20 Development Project (project). The proposed project is located at 2364 Road 20 in San Pablo, California, (Assessor Parcel Number 416-120-029) as depicted in the accompanying figures (see Attachment 1).

The project site is currently developed with a residential building, an ancillary building, paved parking areas, and fencing. The proposed project entails demolition of the existing structures to construct a new multi-family five-story residential building which would include 64 multi-family rental units, a parking garage, surface parking, and parking lifts. No structures would be constructed within a 30-foot setback from the top of bank of San Pablo Creek which runs along the southern edge of the parcel. Two existing decks on the parcel extend through the setback and over the creek top of bank. The decks will be removed as part of the project.

Please notify us if your organization has any information or concerns about historical resources within the project site. This is not a research request; it is solely a request for public input related to any concerns that the San Pablo Historical Society may have pertaining to historical resources. If you have any questions or comments, please contact me at your earliest convenience at [Susan.ZamudioGurrola@mbakerintl.com](mailto:Susan.ZamudioGurrola@mbakerintl.com) or (805) 384-4090.

Sincerely,



Susan Zamudio-Gurrola, MHP  
Senior Architectural Historian

Attachments:

**Attachment 1** - Figures



★ Project Location

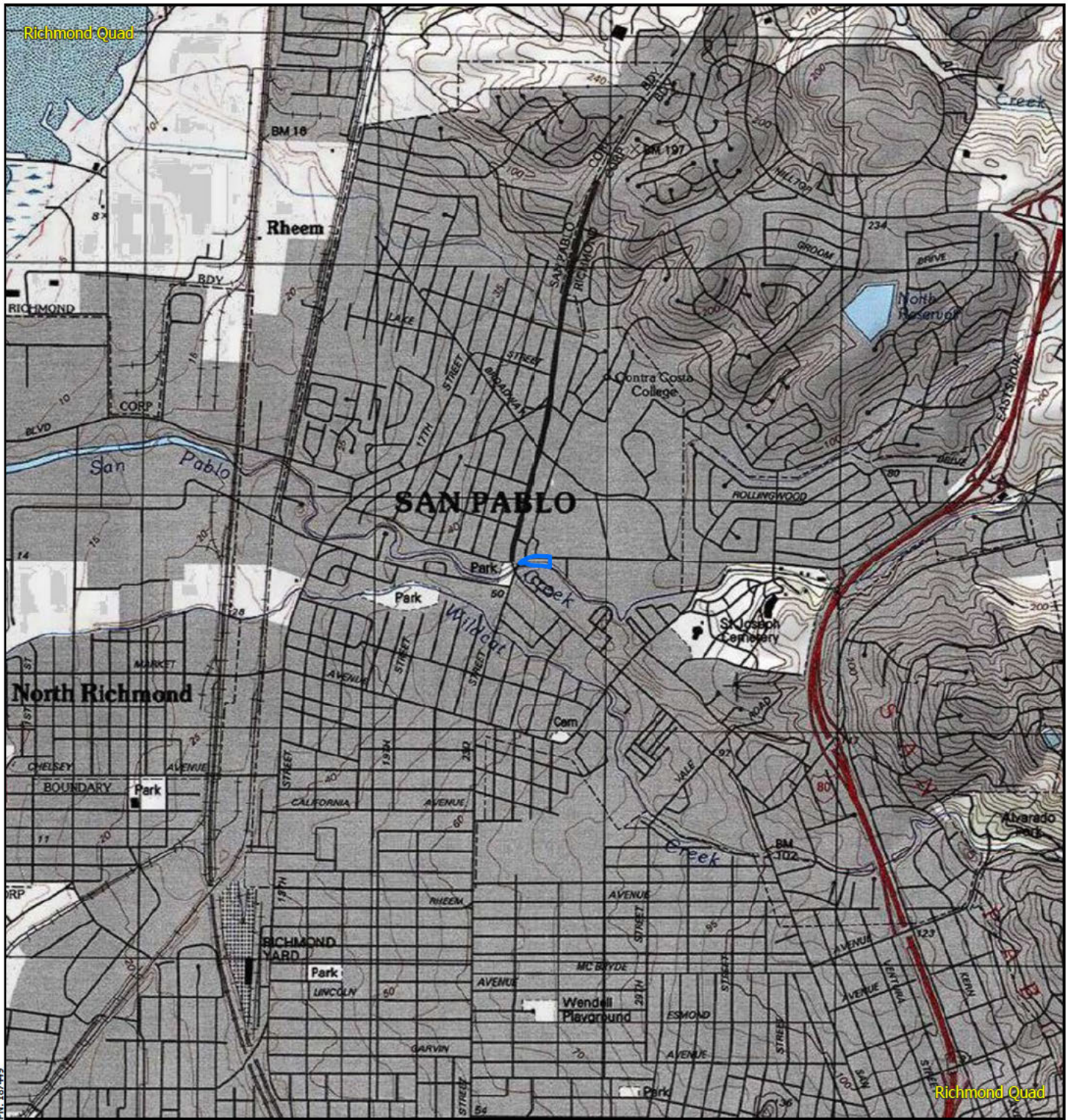
Michael Baker  
INTERNATIONAL



Source: Esri, ArcGIS Online, National Geographic World Map: San Pablo, California

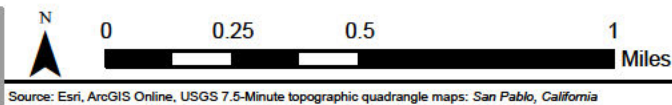
2364 ROAD 20  
SAN PABLO, CALIFORNIA  
**Regional Vicinity**

Figure 1



 Project Area

**Michael Baker**  
INTERNATIONAL



2364 ROAD 20  
SAN PABLO, CALIFORNIA  
**Project Vicinity**

Figure 2



PH: 187449

 Project Area

**Michael Baker**  
INTERNATIONAL



0 50 100 200  
Feet

Source: Esri, ArcGIS Online, 2021 Nearmap Imagery: San Pablo, California

2364 ROAD 20  
SAN PABLO, CALIFORNIA  
**Project Area**

Figure 3

## ZamudioGurrola, Susan

---

**From:** ZamudioGurrola, Susan  
**Sent:** Thursday, February 17, 2022 4:06 PM  
**To:** San Pablo Museums  
**Subject:** Re: Local Historical Group Outreach re: 2364 Road 20 Development Project  
**Attachments:** 1959 aerial with outline.png

Hello again, Janet,

I have been conducting research on Ken's Nursery in newspapers and general internet searches, but I feel there is a piece of information that is alluding me. Therefore, I wanted to ask if you knew any more information about the business prior to it being located at 2364 Road 20. You mentioned below Ken was interned during WWII, "but was able to reestablish his business after the war", so I thought you might know if he originally had a nursery elsewhere? And lastly, do you know anything about the buildings that were once located on the western half of the 2364 Road 20 property? They are visible on aerial photos, but the City building permit records don't seem to include them (perhaps they are filed under a different address, not 2364...). I have attached a 1959 aerial photo with a box generally around the property to demonstrate.

Thank you,

**Susan Zamudio-Gurrola, MHP** | Senior Architectural Historian | she/her  
**Michael Baker International** | *We Make a Difference*  
2945 Townsgate Road, Suite 200 | Thousand Oaks, CA 91361  
[O] 805-384-4090 | [M] 310-592-0815  
susan.zamudiogurrola@mbakerintl.com | www.mbakerintl.com

---

**From:** ZamudioGurrola, Susan  
**Sent:** Monday, January 31, 2022 5:50 PM  
**To:** San Pablo Museums <sanpablomuseums@gmail.com>  
**Subject:** RE: EXTERNAL: Re: Local Historical Group Outreach re: 2364 Road 20 Development Project

Thank you very much for the information. That is very helpful.

**Susan Zamudio-Gurrola, MHP** | Senior Architectural Historian | she/her  
**Michael Baker International** | *We Make a Difference*  
5051 Verdugo Way, Suite 300 | Camarillo, CA 93012  
[O] 805-384-4090 | [M] 310-592-0815  
[susan.zamudiogurrola@mbakerintl.com](mailto:susan.zamudiogurrola@mbakerintl.com) | [www.mbakerintl.com](http://www.mbakerintl.com)

---

**From:** San Pablo Museums <[sanpablomuseums@gmail.com](mailto:sanpablomuseums@gmail.com)>  
**Sent:** Monday, January 31, 2022 4:58 PM  
**To:** ZamudioGurrola, Susan <[Susan.ZamudioGurrola@mbakerintl.com](mailto:Susan.ZamudioGurrola@mbakerintl.com)>  
**Subject:** EXTERNAL: Re: Local Historical Group Outreach re: 2364 Road 20 Development Project

Hi,

We are an all volunteer organization with limited resources.

I am not aware of any historical significance of that particular property. However we are aware that there have been significant and large amounts of Native American [REDACTED] along San Pablo Creek. The closest ones we are aware of [REDACTED] San Pablo.

When [REDACTED] significant amounts of Native American artifacts were discovered, some of which are in our collection. There are numerous newspaper articles about the archeological digs done in this area.

The only thing we know about the specific property was that it was Ken's Nursery. The owner was Ken Tokuyoshi. He was Japanese and was interred by the Government during the Second World War but was able to reestablish his business after the war. The nursery was still operational at least until sometime in the 1990s.

I hope this has been helpful to you.

Janet Pottier, President  
San Pablo Historical and Museum Society  
13873 San Pablo Ave., San Pablo, CA 94806  
(510) 255-7488  
Facebook: [San Pablo Historical & Museum Society](#)  
Website: [San Pablo Historical Society Museum](#)

On Fri, Jan 28, 2022 at 11:08 AM ZamudioGurrola, Susan <[Susan.ZamudioGurrola@mbakerintl.com](mailto:Susan.ZamudioGurrola@mbakerintl.com)> wrote:

Good morning,

Michael Baker International is conducting a cultural resources investigation for the 2364 Road 20 Development Project in San Pablo, CA. Please see the attached letter for additional details about the project. We are conducting outreach to you, the local historical society, to ask if you have any information or concerns about historical resources within the project site. If you have any questions or comments, please contact me at the phone or email below.

Thank you for your time,

**Susan Zamudio-Gurrola, MHP** | Senior Architectural Historian | she/her  
5051 Verdugo Way, Suite 300 | Camarillo, CA 93012 | [O] 805-384-4090 | [M] 310-592-0815  
[susan.zamudiogurrola@mbakerintl.com](mailto:susan.zamudiogurrola@mbakerintl.com) | [www.mbakintl.com](http://www.mbakintl.com) f t i in y

**Michael Baker**

| We Make a L

## ZamudioGurrola, Susan

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**From:** San Pablo Museums <sanpablomuseums@gmail.com>  
**Sent:** Monday, January 31, 2022 4:58 PM  
**To:** ZamudioGurrola, Susan  
**Subject:** EXTERNAL: Re: Local Historical Group Outreach re: 2364 Road 20 Development Project

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi,

We are an all volunteer organization with limited resources.

I am not aware of any historical significance of that particular property. However we are aware that there have been significant and large amounts of Native American [REDACTED] along San Pablo Creek. The closest ones we are aware of [REDACTED] in San Pablo.

[REDACTED] these sites were developed significant amounts of Native American artifacts were discovered, some of which are in our collection. There are numerous newspaper articles about the archeological digs done in this area.

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Good morning,

Michael Baker International is conducting a cultural resources investigation for the 2364 Road 20 Development Project in San Pablo, CA. Please see the attached letter for additional details about the project. We are conducting outreach to you, the local historical society, to ask if you have any information or concerns about historical resources within the project site. If you have any questions or comments, please contact me at the phone or email below.

Thank you for your time,

**Susan Zamudio-Gurrola, MHP** | Senior Architectural Historian | she/her  
5051 Verdugo Way, Suite 300 | Camarillo, CA 93012 | [O] 805-384-4090 | [M] 310-592-0815  
[susan.zamudiogurrola@mbakerintl.com](mailto:susan.zamudiogurrola@mbakerintl.com) | [www.mbakerintl.com](http://www.mbakerintl.com)     



# **Attachment 3**

## **DPR 523 Series Forms**

State of California - The Resources Agency  
DEPARTMENT OF PARKS AND RECREATION  
**PRIMARY RECORD**

Primary #  
HRI #  
Trinomial  
NRHP Status Code

Other Listings  
Review Code

Reviewer

Date

Page 1 of 8

\*Resource Name or #: 2364 Road 20

**P1. Other Identifier:** Ken's Nursery

\***P2. Location:** ☒ **Unrestricted**

\***a. County** Contra Costa **and** (P2c, P2e, and P2b or P2d.

\***b. USGS 7.5' Quad** *Richmond, Calif.* **Date** T 1N; R 4W; (unsectioned) M.D.B.M

c. Address 2364 Road 20 City San Pablo Zip 94560

d. UTM: Zone 10 S, 557621.46 mE/ 4201928.21 mN

e. Other Locational Data: APN 416-120-029

\***P3a. Description:**

The property at 2364 Road 20 in San Pablo consists of an irregularly shaped 1.04-acre parcel located at the southeast corner of the intersection of Road 20 and San Pablo Avenue. The commercially zoned property contains a one-story, 1,646-square-foot, wood-framed, single-family residence, and a shed-like ancillary building near the northeastern edge of the parcel. A paved surface parking lot occupies the majority of the western portion of the parcel. The southern edge of the parcel is adjacent to San Pablo Creek, and abundant vegetation is noted in that area.

Built in 1943, the residential building has an irregular footprint and rests on a concrete foundation. It is clad with rough stucco, and features a cross-gabled roof that has a shallow overhang and is covered with composite shingles. The building faces north toward Road 20 and has a large setback. The primary entrance on the façade is off-center and contains a paneled door and aluminum screen door, which are accessed via a set of concrete steps. Above the entrance is a small flat roof supported by a knee brace. Each end of the façade has a front-facing gabled bay containing a window. Continued on page 4.

\***P3b. Resource Attributes:** HP2. Single Family Property HP4. Ancillary Building

\***P4. Resources Present:** ☒ Building

P5a. Photograph or Drawing



**P5b. Description of Photo:**

Photo 1: Residence - north façade, view looking southwest, 2-2-2022.

**P6. Date Constructed/Age and**

**Source:** ☒ Historic

1943 (ParcelQuest Lite 2022)

\***P7. Owner and Address:**

Unknown

\***P8. Recorded by:**

Susan Zamudio-Gurrola, MHP  
Michael Baker International  
2729 Prospect Park Dr. Suite 220  
Rancho Cordova, CA 95670

\***P9. Date Recorded:** 2/1/2022

\***P10. Survey Type:** Intensive  
Pedestrian

\***P11. Report Citation:**

Abdo, Kholood and Susan Zamudio-Gurrola. 2022. *Cultural Resources Identification Memorandum for the 2364 Road 20 Development Project, San Pablo, Contra Costa County, California.*

\***Attachments:** ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record

## BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 of 8

\*NRHP Status Code:

\*Resource Name or # 2364 Road 20

- B1. Historic Name: Ken's Nursery  
B2. Common Name: Ken's Nursery  
B3. Original Use: Nursery

B4. Present Use: Residence surrounded by vacant land

\*B5. **Architectural Style:** Residence is suggestive of Minimal Traditional style; ancillary building has no discernible style

\*B6. **Construction History:**

Per Contra Costa County Assessor records, the residence was constructed in 1943. City of San Pablo building permit records indicate work was completed in 1948, but the description, owner, and builder are illegible. New windows were installed in 1952. A concrete block storage shed was built in 1959. A patio with a plastic roof was built for nursery use in 1960.

Alterations/addition of two rooms to the residence were completed in 1965. A redwood deck was built at the rear of the residence in 1995. The residence was re-stuccoed in 1997. Re-roofing was completed in 1969, 1970, 1990, and 2007. Various electrical and plumbing permits indicate improvements such as wall heater installation, rewiring, and undergrounding electrical were completed between 1965 and 1986 (City of San Pablo, n.d.).

\*B7. **Moved?** ☒ No

\*B8. **Related Features:** N/A

B9a. Architect: Unknown

b. Builder: Unknown

\*B10. **Significance: Theme** Commercial Development

**Area:** San Pablo

**Period of Significance** N/A

**Property Type** Residential

**Applicable Criteria** N/A

Contra Costa County was incorporated in 1850 as one of the original 27 counties in the state of California. The county developed into a hub for agricultural, industrial, and maritime industries, supported by the region's topography, climate, and natural resources. The area surrounding the city of San Pablo contained quality grazing and agricultural land. San Pablo developed on land that was once part of Rancho San Pablo or Rancho de los Cuchiynes, granted in 1823 to Don Francisco Maria Castro, a former Mexican soldier and alcalde (mayor) of San Jose. The rancho became a local center of commerce and produced hide, tallow, and agricultural products to the presidios in San Francisco and Monterey. Following the Gold Rush and influx of newcomers to the area, the ranching families experienced financial difficulties partially stemming from legal battles relating to squatters and land claims. Settlement of the large rancho increased during this period (WSA Inc. 2017).

San Pablo grew slowly during the second half of the nineteenth century surrounded by agricultural uses. In 1878, the railway terminus was completed in Point Richmond, after which industrial facilities increased along the bay shoreline north and west of San Pablo. At the end of century, many local residents worked in explosive plants located on the bay shoreline. Explosive plants continued to operate in the area through the mid-twentieth century. World War II brought a boom in shipbuilding activity to the region, and drew thousands of new residents. San Pablo experienced considerable residential and commercial growth in the post-war years, similar to many communities throughout the state (WSA Inc. 2017). Continued on p 4.

B11. Additional Resource Attributes: N/A

\*B12. **References:** See continuation sheet, page 5.

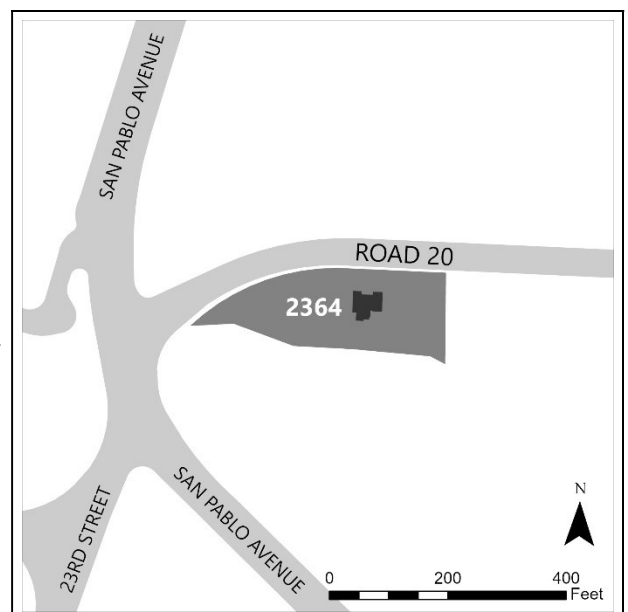
B13. Remarks: None.

\*B14. **Evaluator:**

Susan Zamudio-Gurrola, Michael Baker International

\*Date of Evaluation: 3-Feb-22

(This space reserved for official comments.)



**Primary #**  
**HRI#**  
**Trinomial**

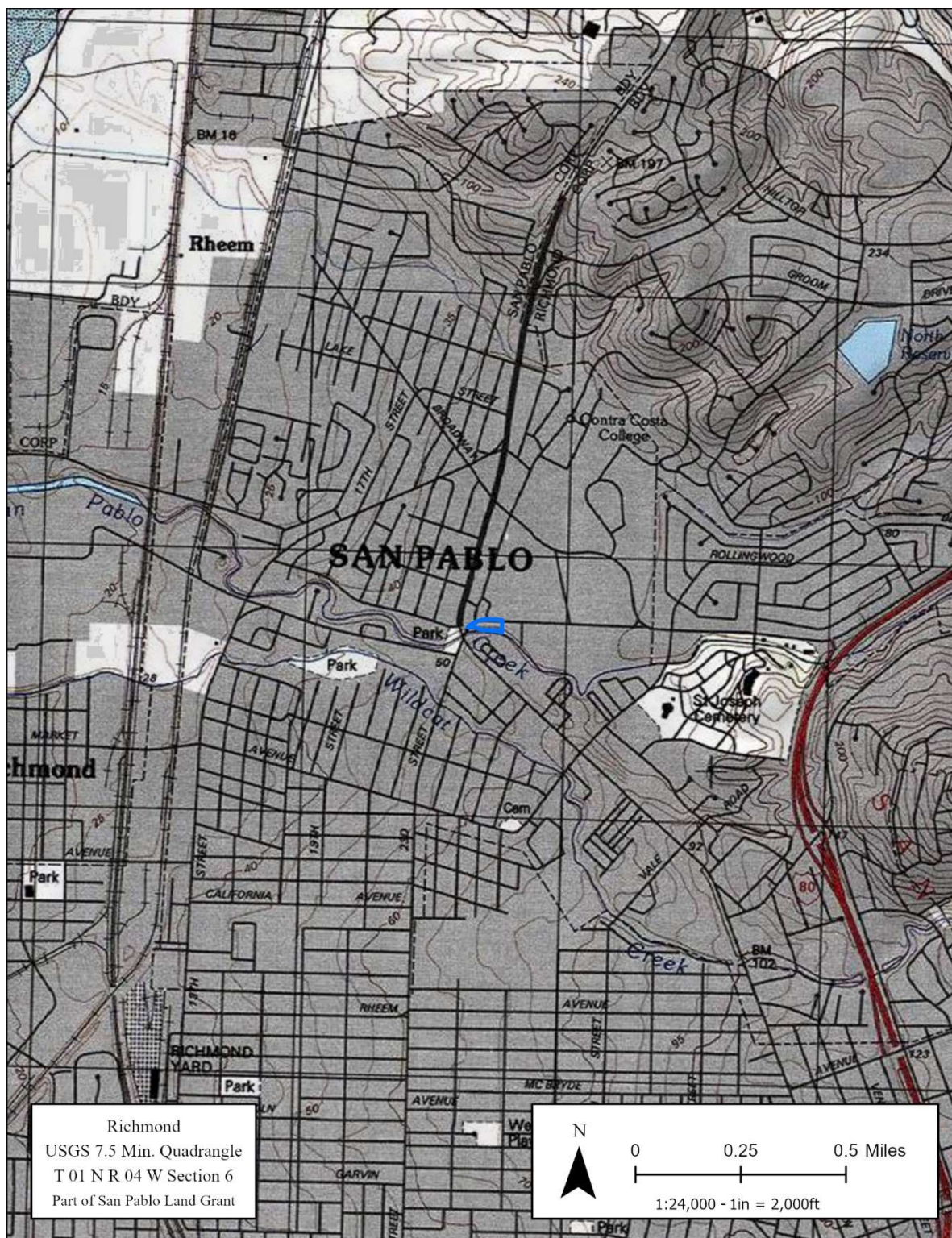
Page 3 of 8

**\*Map Name:** *Richmond, Calif.*

**\*Scale: 1:24,000**

**\*Resource Name or #** 2364 Road 20

**\*Date of map:** 1995 (1999 edition)



## CONTINUATION SHEET

Page 4 of 8

\*Resource Name or # 2364 Road 20

\*Recorded by: Susan Zamudio-Gurrola, Michael Baker International

\*Date: 3-Feb-22 ☒ Continuation

**\*P3a. Description, continued:**

Fenestration includes wood sash picture windows, 1/1 double-hung, and slider windows. Two sheds are attached to the east side of the building. A sunroom is located on the south elevation, as well as an addition which has a flat roof and aluminum sliding windows. A wooden staircase leads to a large wooden deck that is attached to the rear of the home and projects to the south. The edge of the deck is lined with a fence made of wooden posts and corrugated panels. The shed at the northeastern edge of the parcel has a rectangular footprint, and is constructed with concrete block and corrugated metal panels. It is topped by a shed roof with a wide fascia board across the west-facing façade, which features four bays. Two of the bays are open, one is enclosed by corrugated panels, and the fourth has a corrugated panel sliding door.

The property is encircled by a perimeter chain-link fence, and remnants of the primary entry monument remain near the northern property line. The entry monument once simulated a Japanese torii gate, but all that remains are two brick pillars. Adjacent to the east is a pole sign with mid-century modern styling. The rectangular sign board is topped by a geometric shape, and is supported by two cylindrical aluminum posts. Based on Google Street View archived photos, the sign once had lettering reading "Ken's Nursery" which is no longer extant.

**\*B10. Significance, continued:**

*Property Development History*

Aerial photographs show that in 1939 the property was undeveloped, and the neighboring parcels to the east and north were sparsely developed, and appear to have supported agricultural uses (Google Earth, n.d.). During World War II, the agricultural land across Road 20 to the north was developed with a temporary defense workers' housing project called El Portal Park. That property was later redeveloped; portions were used to build a shopping center, tract homes, and Contra Costa Community College (San Pablo Historical and Museum Society 2021; US Geological Survey 1960; US Department of Commerce Bureau of Public Roads 1957). In addition, the alignment of Road 20 near its intersection with San Pablo Avenue was modified throughout the decades (US Geological Survey 1947, 1949, 1952; University of California, Santa Barbara Library 1959, 1965, 1980, 1988).

USGS topographic quadrangle maps indicate the property contained more than one building sited parallel to Road 20 as early as 1947. County Assessor records indicate the extant residence on the property was constructed in 1943 (ParcelQuest Lite 2022). The earliest building permit on file with the city is dated 1948 and is illegible. Archival research did not uncover the original owner, architect, and builder.

In 1952, Kenichi (Ken) Tokuyoshi and his wife Alice established a business on the property called Ken's Nursery (*Contra Costa Times* 2005). According to Janet Pottier, president of the San Pablo Historical and Museum Society, Ken was interned during World War II because of his Japanese ancestry, but was able to reestablish his nursery business after the war (Pottier 2022). No additional information was located on whether Ken operated a nursery business elsewhere before the war, either in local newspapers, city directories, or inquiries with the San Pablo Historical and Museum Society. Building permit records show that Ken completed various improvements to the property between 1952 and 1997, including installing new windows in 1952, constructing a storage shed in 1959, constructing a patio for nursery use in 1960, building an addition to the residence in 1965, adding the redwood deck at the rear of the residence in 1995, re-stuccoing the residence in 1997, and electrical and re-roofing work (City of San Pablo, n.d.). Buildings on the western half of the property were removed by the late 1980s (UCSB 1980, 1988). Alice died in 2002, and Ken died in 2005 (*Contra Costa Times* 2005). Kikue or Kathy K. Tokuyoshi-Wong then became the property owner. As "big box" stores took business away from smaller nurseries, Ken's Nursery struggled, and the property was sold around 2008 (Sullivan 2007; Bennett 2008). Based on Google Street View archived photos, two of the structures associated with the nursery that were once located to the east of the residence have been removed. Additionally, most of the torii gate-like entry monument has been removed. These alterations occurred after 2019 (Google 2022).

*Property Owner*

Ken Tokuyoshi was born in 1918 in Sacramento, California. Alice Matsumoto was also born in 1918 in California. They were both Nisei (children of Japanese immigrants), and married in 1948. Archival research indicates Ken lived in

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Oakland between 1948 and 1951 (Ancestry 2022a, 2022b, 2022c, 2022e, 2022f; *Oakland Tribune* 1948). He opened Ken's Nursery on the property in 1952. Ken also had growing grounds in Richmond, California, during the late 1970s, in partnership with Jim Tokuyoshi, who appears to have been his son (*Contra Costa Times* 2005; *The Independent* 1977; Ancestry 2022d). Ken was said to be a member of the Beautification Committee (presumably a city committee), and donated plants to churches and organizations in the community. In 1975, he was honored as San Pablo's Man of the Year (*Contra Costa Times* 2005).

### Architectural Style

The extant residence on the property is not representative of any particular architectural style, although, having been constructed in 1943, it is suggestive of Minimal Traditional residential architecture. The Minimal Traditional style emerged during the Great Depression and remained popular through the years immediately following World War II. The housing type was small, inexpensive, and could be rapidly built. Federal Housing Administration (FHA) home loans, and pre-approved FHA designs made Minimal Traditional homes a popular type that could be mass produced. Characteristics include a small scale; a single story; simple compact massing; low to moderately pitched rooflines, typically cross-gabled, side-gabled, or hipped; stucco or wood wall cladding; brick or stone accent cladding; small entrance porch or stoop; steel casement windows or wood windows, typically multi-pane, double-hung or fixed picture; and minimal ornamentation (McAlester 2013; Architectural Resources Group 2019). While the extant residence at 2364 Road 20 was built during the period Minimal Traditional homes were popular, it is comparatively large at 1,646 square feet, and has a more complex plan and roofline with two gabled bays projecting from the façade. Nevertheless, its modest styling, lack of ornamentation, stucco cladding, and small entry stoop are suggestive of a Minimal Traditional style home. In summary, the residence at 2364 Road 20 is not a good, representative example of the Minimal Traditional style or any other architectural style. The extant shed on the property, constructed with concrete block and corrugated metal panels, is a utilitarian structure with no particular architectural style.

### California Register of Historical Resources Evaluation

**Criterion 1** – The property at 2364 Road 20 functioned as a nursery from 1952 to approximately the late 2000s. Archival research did not indicate the property is associated with any significant events or trends in national, state, regional, or local history. While it is generally associated with post-World War II commercial development, the property did not play an important role in the history of commercial development in San Pablo, and is not significant within this context. Thus, it is recommended ineligible under Criterion 1.

**Criterion 2** – While the property at 2364 Road 20 is associated with Kenichi (Ken) and Alice Tokuyoshi, business owners who successfully operated a nursery at the property between 1952 and approximately 2008, archival research did not demonstrate they made significant contributions to national, state or local history. Therefore, the property is recommended ineligible under Criterion 2.

**Criterion 3** – The extant residence is suggestive of Minimal Traditional residential architecture, having been built during the period that the style was popular. However, the residence is comparatively large and has a more complex plan and roofline than is the norm for Minimal Traditional style homes. Therefore, it is not a good representative example of the style, or any other architectural style. The shed on the property is utilitarian. It is not representative of any particular architectural style, and displays modest and common building materials and features. Thus, while building permit records consulted for this study did not identify an architect or builder, it is unlikely the residence or shed was designed by a master architect or builder. In addition, two structures associated with the nursery have been demolished or removed from the property, and the residence has undergone various alterations between the time of its original construction through 1995, including an addition near the southwest end of the building, sheds attached to the east side of the building, and a large deck added to the rear of the building. The buildings on the property do not embody the distinctive characteristics of a type, period, region, or method of construction, nor do they represent the work of a master, or possess high artistic values. Thus, the property is recommended ineligible under Criterion 3.

**Criterion 4** – Available information does not indicate the buildings or property have the potential to yield information important to the prehistory or history of the community, state, or nation; therefore, the property is recommended ineligible under Criterion 4.

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Image of Road 20 with Ken's Nursery in the background, ca. 1950s. Note the residence near the road at the far right of the photo, which is no longer extant. Source: San Pablo Historical and Museum Society.

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P5. Photographs and Descriptions, continued:



Photo 2: Residence, E and N elevations, looking SW.



Photo 3: Residence, S elevation, looking NW.



Photo 4: Residence, W elevation, looking SE.



Photo 5: Shed, W elevation, looking E.



Photo 6: Overview of property, looking S.



Photo 7: Entry monument pillars and sign, looking NW.



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July 26, 2022

Project No: 21-11698

Santosh Addagulla

San Pablo Road 20, LLC

PO Box 960

Newark, California 94560

Via email: marin.hayward@gmail.com

**Subject: Revised Biological Resources Technical Memorandum for the 2364 Road 20 Development Project  
San Pablo, Contra Costa County, California**

Dear Mr. Addagullah:

Rincon Consultants, Inc. was retained by San Pablo Road 20, LLC to prepare a biological resources technical memorandum for the proposed 2364 Road 20 Development Project (project) in the City of San Pablo (City), Contra Costa County, California. Due to a potential lack of conformity to City zoning regulations, and potential for significant effects to sensitive biological resources, the City, acting as the lead agency, has decided to prepare addenda to the San Pablo General Plan EIR and San Pablo Avenue Specific Plan EIR as required under the California Environmental Quality Act (CEQA). This memorandum will support these addenda.

## Project Description

The project proposes construction of a new multi-family five story residential building on the existing developed area of a 0.98-acre parcel (APN 416-120-029) southeast of the Road 20 and San Pablo Avenue intersection (Attachment A, Figures 1 and 2). The development will include 64 rental units, a parking garage, surface parking, and parking lifts. San Pablo Creek runs along the southern end of the parcel.

Local ordinance requires a 30-foot setback from the creek top of bank; however, the project is requesting a variance with parking areas, access driveways, paved pedestrian walkways, and bio-retention areas planned within portions of the setback. No walls or structures are planned for construction within the setback. It should be noted that two existing decks on the parcel extend through the setback and over the creek top of bank. These decks will be removed as part of the project.

## Methods

### *Field Surveys*

Rincon biologist Anastasia Ennis conducted a reconnaissance survey of the project site on September 8, 2021, between the hours of 1500 and 1600 to document existing site conditions, assess vegetation communities, and evaluate the potential for the sites to support special status species habitat, including



sensitive plant and wildlife species. A second site visit was conducted on April 15, 2022, between the hours of 1215 to 1315 to map the extent of riparian vegetation at the project site.

### *Literature and Desktop Review*

Rincon conducted record searches of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB, nine-quad search). The California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants and the United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) were also accessed for this review to obtain comprehensive information regarding State- and federally-listed species, as well as other special status species and sensitive plant communities considered to have potential to occur or known to occur within the *Richmond, California* USGS 7.5-minute topographic quadrangle and/or surrounding eight quadrangles.

## Existing Conditions

The project site includes developed area on the northern half of the site along Road 20, and a fragment of riparian woodland along San Pablo Creek at the southern edge of the site. (Attachment A, Figures 2 and 3). The developed area of the site is paved or graveled and surrounded by wooden or chain-link fencing (see photos in Attachment B). Existing structures occur on the eastern half of the site, including a house with an attached deck that extends south towards the creek, a large shed at the northeast corner of the site, and a smaller deck at the southeastern edge of the site. The house is currently occupied by tenants who operate a tow truck company from the site. A paved area on the western half of the site is used as a parking lot.

Although largely devoid of plants, small patches of ruderal vegetation and escaped ornamentals are present in the developed area, including wild oats (*Avena* sp.), fennel (*Foeniculum vulgare*), panicled willowherb (*Epilobium brachycarpum*), Algerian ivy (*Hedera canariensis*), wandering pellitory (*Parietaria judaica*), bristly oxtongue (*Helminthotheca echioides*), and tomato (*Solanum lycopersicum*). The riparian canopy surrounding San Pablo Creek is dominated by native tree species, including Arroyo willow (*Salix lasiolepis*), Northern California black walnut (*Juglans hindsii*), California buckeye (*Aesculus californica*), boxelder (*Acer negundo*), elderberry (*Sambucus nigra*), and redwood (*Sequoia sempervirens*), although the latter was likely planted. Non-native species, such as Canary Island palm (*Phoenix canariensis*) are also present, and shrubs and herbaceous plants on the banks of the creek are dominated by non-native species. Plants observed on the creek banks and beneath the riparian canopy include horsetail (*Equisetum* sp.), nasturtium (*Tropaeolum majus*), Bear's breeches (*Acanthus mollis*), Himalayan blackberry (*Rubus armeniacus*), and Algerian ivy. The ivy is the dominant herbaceous understory plant, covering creek banks and climbing up trees in the riparian woodland.

San Pablo Creek drains a 26,101-acre watershed, which includes San Pablo and Briones Reservoirs, and flows west into San Francisco Bay over two miles from the project site. Despite the presence of a perennial creek, the surrounding area is heavily developed and urbanized. Land use surrounding the project site is residential and commercial. The creek itself is disturbed by anthropogenic activity and invasive plant species. A homeless encampment was observed at the western edge of the site, on the creek bank at the entrance to the culvert where San Pablo Creek passes under San Pablo Avenue.



Bird species observed in or near the project sites included: Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), and American crow (*Corvus brachyrhynchos*).

## Special Status Species

The review of the resource agency databases for known special-status species occurrences within the nine USGS quadrangles containing and surrounding the project sites identified 52 special status animal species and 72 special status plant species. The site was evaluated for its potential to provide habitat value for these species. Of the species known to occur in the region, the following rare or protected species (twelve [12] animals and four [4] plants) are known to occur in habitat types with characteristics similar to those in the vicinity of the project sites : California overwintering populations of monarch butterfly (*Danaus plexippus* population 1), green sturgeon (*Acipenser medirostris*), steelhead – central California coast Distinct Population Segment (DPS; *Oncorhynchus mykiss irideus*, population 8) California red-legged frog (*Rana draytonii*), western pond turtle (*Emys marmorata*), Cooper's hawk (*Accipiter cooperii*), peregrine falcon (*Falco peregrinus anatum*), bank swallow (*Riparia riparia*), pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), western red bat (*Lasiurus blossevillei*), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), Mt. Diablo fairy lantern (*Calochortus pulchellus*), western leatherwood (*Dirca occidentalis*), Diablo helianthella (*Helianthella castanea*) and Loma Prieta hoita (*Hoita strobilina*).

Overwintering populations of the monarch butterfly (federal candidate endangered species) have been observed within five miles of the project site in stands of eucalyptus (CDFW 2021a). Even in urban areas, monarch butterflies will settle in groves of trees along their migration route. While trees occur in the riparian woodland at the southern edge of the project site, the canopy contains no cypress or eucalyptus, typically preferred by the monarch butterfly, and the small strip of woodland is not well protected from the wind. While there is a low likelihood that monarchs would use trees along San Pablo Creek at the project site as overwintering sites, due to the heavily urbanized and disturbed nature of the surrounding area and lack of recorded occurrences near the project site, no impacts to the monarch butterfly are expected.

Green sturgeon and steelhead (central California coast DPS) are federally threatened fish species that have critical habitat at the mouth of San Pablo Creek, where it connects to the San Francisco Bay. Both species are anadromous and known to occur in drainages that connect to the Bay. Neither species has a recorded occurrence in CNDDb within five miles of the site (CDFW 2021a). No record of green sturgeon has been recorded in San Pablo Creek, thus no impacts to this species are expected. Steelhead have a low potential to occur in San Pablo Creek within the project site. The upper reaches of San Pablo Creek have been dammed to create reservoirs, and the creek passes through many culverts in urban areas, such as the one to the west of the project site, thus spawning habitat is marginal. However, a survey of the creek in 1999 did record steelhead east of the Interstate-80 culvert, 0.8-mile east of the project site, proving that fish passage is possible (Leidy 2005), although it is unlikely that a significant anadromous population will be re-established in San Pablo Creek without significant restoration efforts. Project construction will not impact waters in the creek, thus no impacts to steelhead are expected.

California red-legged frogs are federally threatened and a state species of special concern (SSC). This species is found in or near permanent sources of fresh water with dense, shrubby, or emergent riparian vegetation. Marginal habitat is present within San Pablo Creek, although there is little emergent



vegetation and creek banks are dominated by invasive species. Critical habitat for this species exists five miles to the east and one occurrence (in 2008) has been recorded 4.5 miles to the east of the project site just downstream of San Pablo Dam (CDFW 2021a). The disturbed section of the creek in the project site is surrounded by urban development and is unlikely to support California red-legged frog. Thus, although there is a low potential for this species to occur, impacts are not expected.

Western pond turtle (SSC) is found in ponds, rivers, streams, and irrigation ditches with aquatic vegetation; and within suitable adjacent grasslands for egg laying within 0.33 mile from water. Two CNDDDB occurrences have been recorded within five miles of the project site (CDFW 2021a), both recording deceased turtles found. Despite the presence of suitable aquatic habitat within the creek at the project site, frequent anthropogenic disturbance and urbanized surroundings result in marginal habitat for the western pond turtle. Suitable egg-laying habitat is absent. Thus, there is low potential for western pond turtle to occur within or adjacent to the project site and impacts are not expected.

The Cooper's hawk is a CDFW watchlist species that typically inhabits woodlands and forest edges but can also be found in urban parks and neighborhoods where trees are present. Nests are constructed 25-50 feet high in a variety of tree species, including pines, oaks, beeches, and spruces. Cooper's hawks are aerial predators that feed primarily on medium-sized birds, such as mourning dove (*Zenaida macroura*), American robin (*Turdus migratorius*), and European starling (*Sturnus vulgaris*). (Cornell Lab of Ornithology 2021a). One occurrence of the species (in 2014) is documented in the CNDDDB within five miles of the project site, four miles to the southwest in Miller-Knox Regional Park at the bayfront (CDFW 2021a). Two recent occurrences of the species are documented in eBird within one mile of the project site (Cornell Lab of Ornithology 2021b). Suitable nesting habitat for the species exists in the riparian woodland within the project site, although the surrounding area is developed. The species has a moderate potential to forage or nest in the riparian woodland at the project site. Development will be set back from the riparian area and no impacts to trees are expected.

The peregrine falcon (State fully protected species) has no CNDDDB occurrences recorded within five miles of the project site (CDFW 2021a). Two recent occurrences (in 2019) of the species are documented in eBird within two miles of the project site at the bayfront to the west (Cornell Lab of Ornithology 2021b). No suitable nesting habitat (e.g., cliffs or skyscrapers) for peregrine falcon occurs on or adjacent to the project site; however, this species has a low potential to forage within or near the project site.

Project impacts are limited to paved or disturbed areas and are unlikely to have significant effects on foraging grounds for this species, which typically hunts in the air. Thus, impacts are not expected.

The bank swallow (State threatened species) is a colonial nester in vertical banks of riparian habitat. Due to the presence of vertical banks along San Pablo Creek within the project site, there is a low potential for this species to occur; however, no swallows were observed during the site visit, and no CNDDDB occurrences are recorded within five miles of the project site (CDFW 2021a). Two recent occurrences (in 2019) of the species are documented in eBird within four miles of the project site, along the bayfront to the west (Cornell Lab of Ornithology 2021b). Due to the disturbed nature of the project site and dense vegetation on the banks of the creek within the site, impacts to bank swallow are not expected.

Pallid bat (SSC), Townsend's big-eared bat (SSC) and western red bat (SSC) have low potential to roost in trees on or adjacent to the project site. Two historic occurrences for pallid bat (in 1937 and 1940) are recorded within five miles of the project site (CDFW 2021a). Pallid bats are found in grasslands, shrublands, woodlands, and forests, and may roost in trees or buildings. Townsend's big-eared bat are



found in a wide variety of habitats and may roost in abandoned buildings or large trees. Western red bats roost in forests and woodlands and are typically found in riparian habitats. Bat species are sensitive to disturbance and are unlikely to roost in the buildings on site, which are inhabited, or in the culvert near the project site due to presence of a homeless encampment. Although trees in or near the project site provide marginal roosting sites, due to the disturbed and urbanized locations of the project site, impacts to these three bat species are not expected.

San Francisco dusky-footed woodrat (SSC) can occur in riparian woodlands such as those present on the project site; however, because the riparian woodland is a small, disturbed habitat fragment largely isolated by urban development, the dusky-footed woodrat is not expected to occur in the project site. No CNDDDB occurrences have been recorded within a five-mile radius of the project site and no woodrat middens were observed during the site visit. Impacts to the San Francisco dusky-footed woodrat are not expected.

Mt. Diablo fairy lantern, western leatherwood, and Diablo helianthella (CNPS List 1B.2 plants) and Loma Prieta hoita (CNPS List 1B.1) are rare plants that can all be found in riparian woodland and thus have low potential to occur in the disturbed fragment of riparian woodland on the project site. No occurrences of Mt. Diablo fairy lantern have been recorded within five miles of the project site. Western leatherwood has four recent occurrences within five miles of the project site in Wildcat Canyon Regional Park, with the closest 2.5 miles to the east. No western leatherwood was observed within the project site. Diablo helianthella has three recent occurrences within five miles of the project site from 2008 and earlier, with the closest occurring four miles to the east. Loma Prieta hoita has one recorded occurrence (from 2004) two miles east of the site. The project site does not currently provide suitable habitat for these rare plant species due to high levels of disturbance, presence of invasive vegetation (e.g., Algerian ivy, Himalayan blackberry) and the long-time development in and surrounding the project site, thus impacts to rare plants are not expected.

## Jurisdictional Features

The San Pablo General Plan EIR and San Pablo Avenue Specific Plan EIR both contain suggested mitigation measures to reduce impacts to San Pablo Creek and associated wetlands and riparian areas to less than significant levels. The proposed project intends to seek an adjustment or variance from the San Pablo Specific Plan's required 30-foot setback from top of creekbank for a portion of the site. The project footprint is planned outside of both the top of bank and the canopy of the riparian woodland along San Pablo Creek at the southern edge of the project site (Figure 3). This riparian woodland would be considered a jurisdictional wetland by CDFW to the edge of the canopy (see Attachment A, Figure 3 for the approximate extent of riparian woodland). Development and ground disturbance within the riparian canopy and any disturbance to vegetation (tree removal or trimming) may trigger the need for a Streambed Alteration Agreement with CDFW. San Francisco Bay Regional Water Quality Control Board (RWQCB) may also take jurisdiction of the riparian woodland and any impacts to riparian vegetation are likely to trigger compliance through a Waste Discharge Requirement. The proposed project footprint does not appear to impact riparian woodland or areas below the top of bank. The stream itself is also likely regulated by the U.S. Army Corps of Engineers; however, the proposed project does not appear to impact the actual stream channel.



## Conclusions

The existing conditions of the project site include developed and disturbed habitat bounded by busy urban roadways and additional development. The narrow band of riparian woodland on either side of San Pablo Creek within and adjacent to the project site contains both native and non-native species but is disturbed by anthropogenic activities and largely isolated as a result of surrounding residential and commercial development. Riparian vegetation and the aquatic habitat of San Pablo Creek within the project site may provide marginally suitable habitat for wildlife, including steelhead, Cooper's hawk, nesting birds, and roosting bats. However, the project is designed to minimize impacts by re-use of previously developed areas and would avoid significant disturbance of riparian habitat or areas below the top of bank. Thus, the project is unlikely to affect special status species.

The project footprint as currently designed would not impact riparian habitat or other jurisdictional areas surrounding San Pablo Creek. If any trees or vegetation must be impacted as part of construction, the City of San Pablo's General Plan (Implementing Policy OSC-I-8) requires scheduling of construction and vegetation removal outside of nesting bird season or conducting a preconstruction nesting bird survey. If removal of mature trees is required, the General Plan (Implementing Policy OSC I-9) requires a pre-construction acoustic survey to determine if bats are present. Any disturbance to San Pablo Creek water quality through removal of the deck structures will be avoided through implementation of best management practices, such as a stormwater pollution prevention plan, as required by Implementing Policy OSC I-9 in the General Plan and the Municipal Code (Chapter 17.40). Because protecting nesting birds, roosting bats, and water quality is standard city policy and would be implemented as a condition of approval for the project, potentially significant impacts to special status species and their habitats will be avoided.

Thank you for the opportunity to provide environmental support on this project service. Please contact us if you have questions, or if we can be of further assistance.

Sincerely,  
**Rincon Consultants, Inc.**

A handwritten signature in blue ink that reads "Anastasia G. Ennis".

Anastasia G. Ennis, M.S.  
Biologist

A handwritten signature in blue ink that reads "Sherri Miller".

Sherri Miller, M.S.  
Vice President/Principal Biologist

## Attachments

|              |                  |
|--------------|------------------|
| Attachment A | Figures          |
| Attachment B | Site Photographs |



## References

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# Attachment A

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Figures

### Figure 1 Regional Location

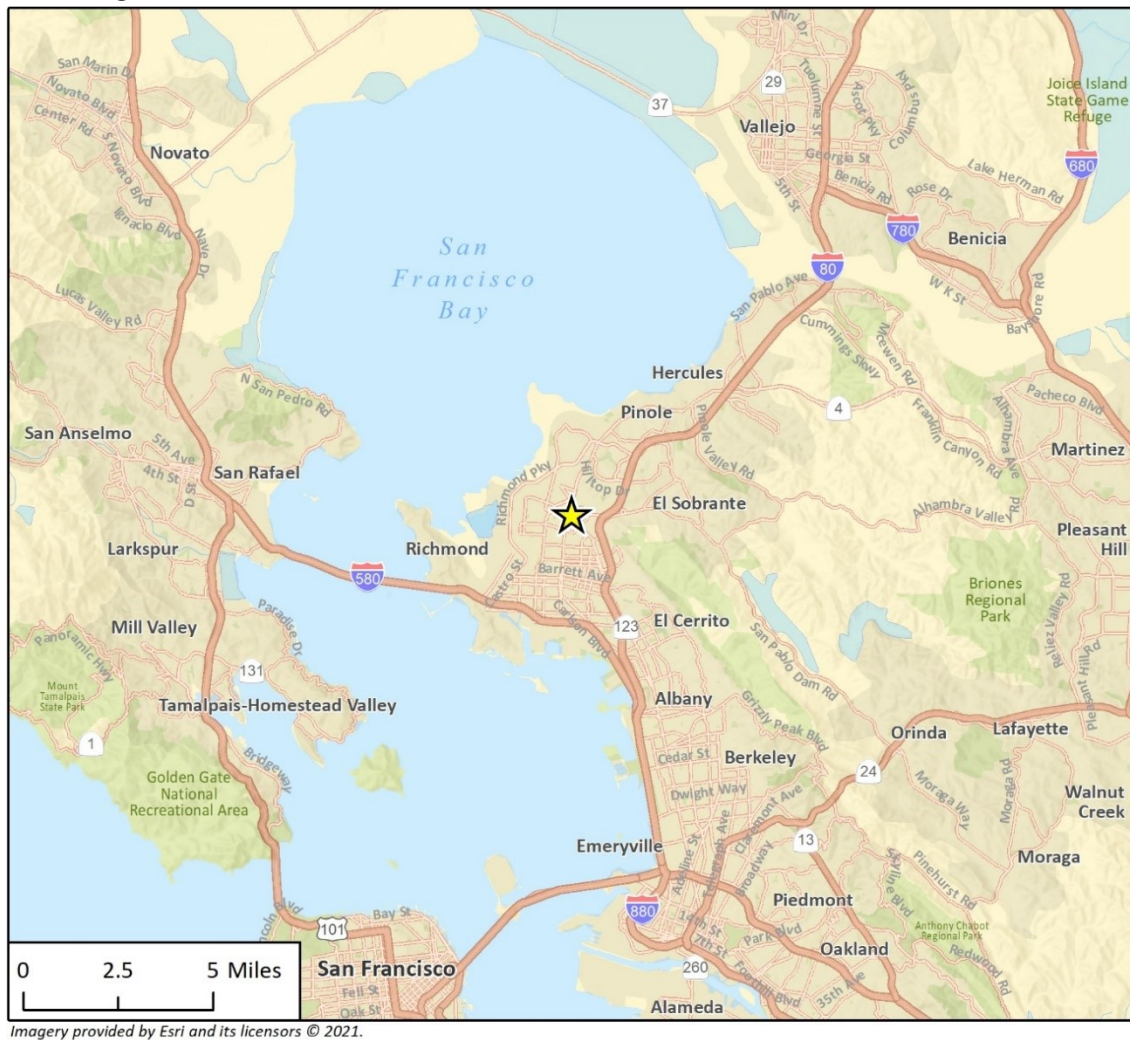
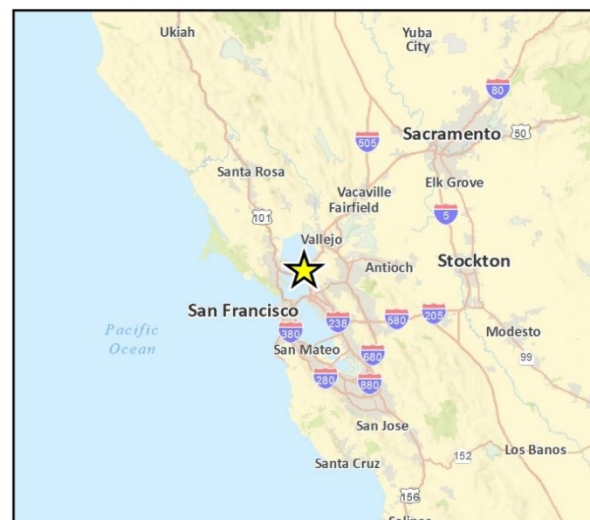


Figure 2 Project Location



Imagery provided by Microsoft Bing and its licensors © 2021.

Fig. 2. Project Location

**Figure 3 Project Footprint and Riparian Habitat**





# Attachment B

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Site Photographs



**Photograph 1.** San Pablo Creek at east side of culvert under San Pablo Avenue, facing south-southwest.



**Photograph 2.** View of larger deck adjacent to house, facing west-southwest.



**Photograph 3.** View of smaller deck at southeast corner of property, facing south-southeast.



**Photograph 4.** View of San Pablo Creek from larger deck, facing south.



**Photograph 5.** Overview of site from the western end, showing house, shed, edge of riparian woodland at right, and graveled lot, facing east.



**Photograph 6.** Overview of western half of site, including edge of riparian woodland at left, paved lot, and graveled lot beyond, facing west-southwest.

March 9, 2020

Ms. Rita Azzolino and Mr. Joseph Azzolino

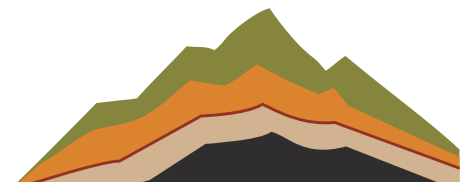
**Subject: Soil Analytical Test Results**  
2364 Rd 20  
San Pablo, California  
Geo-Engineering Solutions Proposal No. 78-1225

Dear Ms. & Mr. Azzolino:

Pursuant to your request, Geo-Engineering Solutions, Inc. (Geo-Eng) provided analytical sampling and testing services of on-site soil for the subject site. On February 24, 2020, a Geo-Eng representative collected three soil discrete samples (S1 through S3) from the subject site. Geo-Eng was not made aware of any past environmental issues or concerns at the site. The soil samples were transported on-ice, under a Chain-of-Custody, to a California State-Certified laboratory for testing.

The soil sample were analyzed on a standard turnaround time for the presence of Asbestos by CARB 435, Organochlorine Pesticides by EPA Method 8081A, PCBs by EPA Method 8082, Volatile Organic Compounds by EPA Method 8260B, Semi-Volatile Organics by EPA Method 8270C, California Metals by EPA Method 6020, Total Petroleum Hydrocarbon (TPH) as Gasoline with BTEX and MTBE by EPA Method 8021B/8015Bm, and TPH-diesel and TPH-motor oil by EPA Method 8015B.

For your assistance, the attached Table 1 compares the analytical results to the January 2019 California Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs), assuming direct exposure to human health risk levels for shallow soils under residential and commercial/industrial land use scenarios, as well as for direct exposure to human health risk levels under and land use at any depth for construction workers. These screening levels are assumed to be conservative. Constituents whose concentrations exceeded the noted SFRWQCB ESLs are noted in bold in the table. We note that waste facilities provide their own criteria for acceptance of off-haul material and these results should be provided and screened by them for acceptance or further testing requirements as applicable. We recommend that the results be reviewed immediately to determine whether any additional testing or extraction requirements are warranted. Additional testing may require additional sampling depending on the quantity of sample remaining in the analytical testing laboratory's custody.



Only arsenic was detected in the three soil samples S1 through S3 at concentration of 6.2 mg/kg, 6.5 mg/kg and 9.4 mg/kg, respectively, exceeding the ESL standards. However, the indicated level is not considered to be high enough to be a concern since background arsenic levels are naturally elevated in the Bay Area, and in any case are not high enough to warrant STLC testing. The San Francisco RWQCB website references a 2011 Master's thesis that evaluates background arsenic concentrations in the San Francisco Bay Region. This thesis proposes an upper (99<sup>th</sup> percentile) estimate of background arsenic of 11 mg/kg within undifferentiated urbanized Bay Area flatland soils.

Chromium was detected in soil sample S2 at a concentration of 67 mg/kg, above the Tier 1-ESLs. Soluble Threshold Limit Concentrations (STLC) is used to define the "soluble fraction" that classifies a "waste" as California hazardous. Non-hazardous disposal facilities utilize a rule-of-thumb guideline to interpret total contaminant concentrations relative to the STLC hazardous waste criteria. Soils or waste with total contaminant concentrations in excess of 10 times the STLC (50 mg/kg) have the potential to be classified as hazardous and they are also analyzed by the California Waste Extraction Test (WET) when the subsequent solute analysis results exceeds the STLC for Cr (5 mg/L). The result of the STLC for chromium was not detected in the lab. Therefore, the soil is not considered to be a California hazardous waste.

It is our pleasure to be of service to you. If you should have any questions regarding this letter or would like to request additional sampling or testing, undersigned at (925) 433--0450; or by e-mail at [eswenson@geo-eng.net](mailto:eswenson@geo-eng.net).

Sincerely,  
**GEO-ENGINEERING SOLUTIONS, INC.**



Nicolas Haddad, PE  
Senior Geotechnical Engineer



Eric J. Swenson, G.E., C.E.G.  
President



Attachments: Table 1, Soil Analytical Results  
McCampbell Analytical Reports with chain of custody

**Table 1**  
**Summary of Soil Analytical Results**  
**2364 Rd 20, San Pablo, CA**

| Sample ID                    | S1      | S2    | S3    | Direct Exposure Human Health Risk Levels |            |                                                                |
|------------------------------|---------|-------|-------|------------------------------------------|------------|----------------------------------------------------------------|
|                              |         |       |       |                                          |            | Construction Worker<br>Any Land Use<br>Any Depth Soil Exposure |
|                              |         |       |       | Residential                              | Commercial |                                                                |
|                              |         |       |       | Shallow Soil Exposure                    |            |                                                                |
|                              | (mg/kg) |       |       |                                          |            |                                                                |
| CAM 17 Metals                |         |       |       |                                          |            |                                                                |
| Antimony                     | 0.59    | 0.58  | 0.59  | 11                                       | 160        | 50                                                             |
| Arsenic                      | 6.2     | 6.5   | 9.4   | 0.26                                     | 3.6        | 0.98                                                           |
| Barium                       | 180     | 170   | 120   | 15,000                                   | 220,000    | 3,000                                                          |
| Beryllium                    | ND      | 0.61  | ND    | 16                                       | 230        | 27                                                             |
| Cadmium                      | 0.27    | ND    | 0.94  | 78                                       | 1,100      | 51                                                             |
| Chromium                     | 43      | 67    | 44    | -                                        | -          | -                                                              |
| Cobalt                       | 10      | 12    | 9.3   | 23                                       | 350        | 28                                                             |
| Copper                       | 22      | 27    | 130   | 3,100                                    | 47,000     | 14,000                                                         |
| Lead (TTLC)                  | 23      | 14    | 37    | 80                                       | 320        | 160                                                            |
| Mercury                      | 0.5     | 0.37  | 0.21  | 13                                       | 190        | 44                                                             |
| Molybdenum                   | ND      | 0.72  | ND    | 390                                      | 5,800      | 1,800                                                          |
| Nickel                       | 47      | 72    | 42    | 820                                      | 11,000     | 86                                                             |
| Selenium                     | 1.2     | 1.2   | 1     | 390                                      | 5,800      | 1,700                                                          |
| Silver                       | ND      | ND    | ND    | 390                                      | 5,800      | 1,800                                                          |
| Thallium                     | ND      | ND    | ND    | 78                                       | 12         | 4                                                              |
| Vanadium                     | 44      | 62    | 43    | 390                                      | 5,800      | 470                                                            |
| Zinc                         | 70      | 66    | 91    | 23,000                                   | 350,000    | 110,000                                                        |
| Pesticides/PCBs              |         |       |       |                                          |            |                                                                |
| Chlordane                    | ND      | ND    | ND    | 36                                       | 500        | 130                                                            |
| p,p-DDD                      | ND      | ND    | ND    | -                                        | -          | -                                                              |
| p,p-DDE                      | ND      | ND    | ND    | -                                        | -          | -                                                              |
| p,p-DDT                      | ND      | ND    | ND    | 37                                       | 520        | 140                                                            |
| Volatile Organics            |         |       |       |                                          |            |                                                                |
| TPH (gasoline)               | ND      | ND    | ND    | 430                                      | 200        | 1,800                                                          |
| TPH (diesel)                 | 17      | 8.7   | 3.2   | 260                                      | 1,200      | 1,100                                                          |
| TPH (motor Oil)              | 140     | 71    | 88    | 12,000                                   | 180,000    | 54,000                                                         |
| Benzene                      | ND      | ND    | ND    | 11                                       | 47         | 45                                                             |
| Ethylbenzene                 | ND      | ND    | ND    | 3,400                                    | 21,000     | 15,000                                                         |
| MTBE                         | ND      | ND    | ND    | 16,000                                   | 66,000     | 65,000                                                         |
| Toluene                      | ND      | ND    | ND    | 1,100                                    | 5,300      | 4,700                                                          |
| Total Xylenes                | ND      | ND    | ND    | 580                                      | 2,500      | 2,400                                                          |
| Semi-Volatile Organics       |         |       |       |                                          |            |                                                                |
| Acenphthylene                | ND      | 0.028 | ND    | 3,600                                    | 45,000     | 10,000                                                         |
| Anthracene                   | ND      | 0.078 | 0.022 | 18,000                                   | 230,000    | 50,000                                                         |
| Benzo (a) anthracene         | ND      | 0.14  | ND    | -                                        | -          | -                                                              |
| Benzo (a) pyrene             | ND      | 0.061 | ND    | 18                                       | 220        | 10                                                             |
| Benzo (b) fluoranthene       | ND      | ND    | ND    | -                                        | -          | -                                                              |
| Benzo (g,h,i) perylene       | 0.042   | 0.041 | ND    | -                                        | -          | -                                                              |
| Benzo (K) fluoranthene       | 0.025   | 0.046 | ND    | -                                        | -          | -                                                              |
| Bis (2-ethylhexyl) Phthalate | ND      | ND    | ND    | 1,300                                    | 16,000     | 3,800                                                          |
| Chrysene                     | ND      | 0.11  | ND    | -                                        | -          | -                                                              |
| Dibenzo (a,h) anthracene     | ND      | ND    | ND    | -                                        | -          | -                                                              |
| Fluoranthene                 | 0.044   | 0.24  | 0.076 | 2,400                                    | 30,000     | 6,700                                                          |
| Fluorene                     | ND      | ND    | ND    | 2,400                                    | 30,000     | 6,700                                                          |
| 2-Methylnaphthalene          | ND      | ND    | ND    | 240                                      | 3,000      | 670                                                            |
| Indeno (1,2,3-cd) pyrene     | ND      | ND    | ND    | -                                        | -          | -                                                              |
| Pentachlorophenol            | ND      | ND    | ND    | 250                                      | 2,800      | 560                                                            |
| Phenanthrene                 | ND      | 0.27  | ND    | -                                        | -          | -                                                              |
| Phenol                       | ND      | ND    | ND    | 23,000                                   | 350,000    | 98,000                                                         |
| Pyrene                       | 0.044   | 0.19  | 0.064 | 1,800                                    | 230,000    | 5,000                                                          |

ND Not Detectable

TTLC = Total Threshold Limit Concentrations

STLC = Soluble Threshold Limit Concentrations

**Reported Concentrations in bold exceed the corresponding January 2019 SFRWQCB ESL standards**



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 2002874

**Report Created for:** Geo-Engineering Solutions, Inc.

2570 San Ramon Valley Blvd A102  
San Ramon, CA 94583

**Project Contact:** Nicolas Haddad

**Project P.O.:** 1225

**Project:** 78-1225; San Pablo

**Project Received:** 02/24/2020

Analytical Report reviewed & approved for release on 03/02/2020 by:

Christine Askari  
Project Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.*





## Glossary of Terms & Qualifier Definitions

**Client:** Geo-Engineering Solutions, Inc.  
**Project:** 78-1225; San Pablo  
**WorkOrder:** 2002874

### Glossary Abbreviation

|              |                                                                                          |
|--------------|------------------------------------------------------------------------------------------|
| %D           | Serial Dilution Percent Difference                                                       |
| 95% Interval | 95% Confident Interval                                                                   |
| CPT          | Consumer Product Testing not NELAP Accredited                                            |
| DF           | Dilution Factor                                                                          |
| DI WET       | (DISTLC) Waste Extraction Test using DI water                                            |
| DISS         | Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)               |
| DLT          | Dilution Test (Serial Dilution)                                                          |
| DUP          | Duplicate                                                                                |
| EDL          | Estimated Detection Limit                                                                |
| ERS          | External reference sample. Second source calibration verification.                       |
| ITEF         | International Toxicity Equivalence Factor                                                |
| LCS          | Laboratory Control Sample                                                                |
| LQL          | Lowest Quantitation Level                                                                |
| MB           | Method Blank                                                                             |
| MB % Rec     | % Recovery of Surrogate in Method Blank, if applicable                                   |
| MDL          | Method Detection Limit                                                                   |
| ML           | Minimum Level of Quantitation                                                            |
| MS           | Matrix Spike                                                                             |
| MSD          | Matrix Spike Duplicate                                                                   |
| N/A          | Not Applicable                                                                           |
| ND           | Not detected at or above the indicated MDL or RL                                         |
| NR           | Data Not Reported due to matrix interference or insufficient sample amount.              |
| PDS          | Post Digestion Spike                                                                     |
| PDSD         | Post Digestion Spike Duplicate                                                           |
| PF           | Prep Factor                                                                              |
| RD           | Relative Difference                                                                      |
| RL           | Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.) |
| RPD          | Relative Percent Deviation                                                               |
| RRT          | Relative Retention Time                                                                  |
| SPK Val      | Spike Value                                                                              |
| SPKRef Val   | Spike Reference Value                                                                    |
| SPLP         | Synthetic Precipitation Leachate Procedure                                               |
| ST           | Sorbent Tube                                                                             |
| TCLP         | Toxicity Characteristic Leachate Procedure                                               |
| TEQ          | Toxicity Equivalents                                                                     |
| TZA          | TimeZone Net Adjustment for sample collected outside of MAI's UTC.                       |
| WET (STLC)   | Waste Extraction Test (Soluble Threshold Limit Concentration)                            |



## Glossary of Terms & Qualifier Definitions

**Client:** Geo-Engineering Solutions, Inc.  
**Project:** 78-1225; San Pablo  
**WorkOrder:** 2002874

### Analytical Qualifiers

|     |                                                                                                           |
|-----|-----------------------------------------------------------------------------------------------------------|
| B   | Analyte detected in the associated Method Blank and in the sample                                         |
| J   | Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value. |
| a3  | Sample diluted due to high organic content.                                                               |
| a4  | Reporting limits raised due to the sample's matrix prohibiting a full volume extraction.                  |
| c2  | Surrogate recovery outside of the control limits due to matrix interference.                              |
| e2  | Diesel range compounds are significant; no recognizable pattern                                           |
| e7  | Oil range compounds are significant                                                                       |
| e8  | Pattern resembles kerosene/kerosene range/jet fuel range                                                  |
| k10 | CARB 435 Exception 1 - No asbestos detected. The limit of quantitation (LOQ) = 0.25%.                     |

### Quality Control Qualifiers

|     |                                                                                         |
|-----|-----------------------------------------------------------------------------------------|
| F1  | MS/MSD recovery and/or RPD is out of acceptance criteria; LCS validates the prep batch. |
| F2  | LCS/LCSD recovery and/or RPD/RSD is out of acceptance criteria.                         |
| F3  | The surrogate standard recovery and/or RPD is outside of acceptance limits.             |
| F16 | RawVal < LQL.                                                                           |



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8081A/8082  
**Unit:** mg/kg

### Organochlorine Pesticides + PCBs

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-1       | 2002874-001A | Soil   | 02/24/2020     | GC23 02242039.d | 194497   |

| Analytes                  | Result | RL   | DF  | Date Analyzed    |
|---------------------------|--------|------|-----|------------------|
| Aldrin                    | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| a-BHC                     | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| b-BHC                     | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| d-BHC                     | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| g-BHC                     | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Chlordane (Technical)     | ND     | 2.5  | 100 | 02/25/2020 02:56 |
| a-Chlordane               | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| g-Chlordane               | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| p,p-DDD                   | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| p,p-DDE                   | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| p,p-DDT                   | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Dieldrin                  | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Endosulfan I              | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Endosulfan II             | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Endosulfan sulfate        | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Endrin                    | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Endrin aldehyde           | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Endrin ketone             | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Heptachlor                | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Heptachlor epoxide        | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Hexachlorobenzene         | ND     | 1.0  | 100 | 02/25/2020 02:56 |
| Hexachlorocyclopentadiene | ND     | 2.0  | 100 | 02/25/2020 02:56 |
| Methoxychlor              | ND     | 0.10 | 100 | 02/25/2020 02:56 |
| Toxaphene                 | ND     | 5.0  | 100 | 02/25/2020 02:56 |
| Aroclor1016               | ND     | 5.0  | 100 | 02/25/2020 02:56 |
| Aroclor1221               | ND     | 5.0  | 100 | 02/25/2020 02:56 |
| Aroclor1232               | ND     | 5.0  | 100 | 02/25/2020 02:56 |
| Aroclor1242               | ND     | 5.0  | 100 | 02/25/2020 02:56 |
| Aroclor1248               | ND     | 5.0  | 100 | 02/25/2020 02:56 |
| Aroclor1254               | ND     | 5.0  | 100 | 02/25/2020 02:56 |
| Aroclor1260               | ND     | 5.0  | 100 | 02/25/2020 02:56 |
| PCBs, total               | ND     | 5.0  | 100 | 02/25/2020 02:56 |

| Surrogates         | REC (%) | Limits |                  |
|--------------------|---------|--------|------------------|
| Decachlorobiphenyl | 112     | 69-143 | 02/25/2020 02:56 |

Analyst(s): LT

Analytical Comments: a3

(Cont.)



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8081A/8082  
**Unit:** mg/kg

### Organochlorine Pesticides + PCBs

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-2       | 2002874-002A | Soil   | 02/24/2020     | GC23 02242053.d | 194497   |

| Analytes                  | Result | RL    | DF | Date Analyzed    |
|---------------------------|--------|-------|----|------------------|
| Aldrin                    | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| a-BHC                     | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| b-BHC                     | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| d-BHC                     | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| g-BHC                     | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Chlordane (Technical)     | ND     | 0.50  | 20 | 02/25/2020 06:36 |
| a-Chlordane               | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| g-Chlordane               | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| p,p-DDD                   | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| p,p-DDE                   | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| p,p-DDT                   | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Dieldrin                  | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Endosulfan I              | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Endosulfan II             | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Endosulfan sulfate        | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Endrin                    | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Endrin aldehyde           | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Endrin ketone             | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Heptachlor                | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Heptachlor epoxide        | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Hexachlorobenzene         | ND     | 0.20  | 20 | 02/25/2020 06:36 |
| Hexachlorocyclopentadiene | ND     | 0.40  | 20 | 02/25/2020 06:36 |
| Methoxychlor              | ND     | 0.020 | 20 | 02/25/2020 06:36 |
| Toxaphene                 | ND     | 1.0   | 20 | 02/25/2020 06:36 |
| Aroclor1016               | ND     | 1.0   | 20 | 02/25/2020 06:36 |
| Aroclor1221               | ND     | 1.0   | 20 | 02/25/2020 06:36 |
| Aroclor1232               | ND     | 1.0   | 20 | 02/25/2020 06:36 |
| Aroclor1242               | ND     | 1.0   | 20 | 02/25/2020 06:36 |
| Aroclor1248               | ND     | 1.0   | 20 | 02/25/2020 06:36 |
| Aroclor1254               | ND     | 1.0   | 20 | 02/25/2020 06:36 |
| Aroclor1260               | ND     | 1.0   | 20 | 02/25/2020 06:36 |
| PCBs, total               | ND     | 1.0   | 20 | 02/25/2020 06:36 |

| Surrogates         | REC (%) | Limits |                  |
|--------------------|---------|--------|------------------|
| Decachlorobiphenyl | 120     | 69-143 | 02/25/2020 06:36 |

Analyst(s): LT

Analytical Comments: a3

(Cont.)



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.

**Date Received:** 02/24/2020 13:04

**Date Prepared:** 02/24/2020

**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874

**Extraction Method:** SW3550B

**Analytical Method:** SW8081A/8082

**Unit:** mg/kg

### Organochlorine Pesticides + PCBs

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-3       | 2002874-003A | Soil   | 02/24/2020     | GC23 02242054.d | 194497   |

| Analytes                  | Result | RL    | DF | Date Analyzed    |
|---------------------------|--------|-------|----|------------------|
| Aldrin                    | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| a-BHC                     | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| b-BHC                     | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| d-BHC                     | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| g-BHC                     | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Chlordane (Technical)     | ND     | 1.2   | 50 | 02/25/2020 06:51 |
| a-Chlordane               | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| g-Chlordane               | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| p,p-DDD                   | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| p,p-DDE                   | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| p,p-DDT                   | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Dieldrin                  | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Endosulfan I              | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Endosulfan II             | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Endosulfan sulfate        | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Endrin                    | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Endrin aldehyde           | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Endrin ketone             | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Heptachlor                | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Heptachlor epoxide        | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Hexachlorobenzene         | ND     | 0.50  | 50 | 02/25/2020 06:51 |
| Hexachlorocyclopentadiene | ND     | 1.0   | 50 | 02/25/2020 06:51 |
| Methoxychlor              | ND     | 0.050 | 50 | 02/25/2020 06:51 |
| Toxaphene                 | ND     | 2.5   | 50 | 02/25/2020 06:51 |
| Aroclor1016               | ND     | 2.5   | 50 | 02/25/2020 06:51 |
| Aroclor1221               | ND     | 2.5   | 50 | 02/25/2020 06:51 |
| Aroclor1232               | ND     | 2.5   | 50 | 02/25/2020 06:51 |
| Aroclor1242               | ND     | 2.5   | 50 | 02/25/2020 06:51 |
| Aroclor1248               | ND     | 2.5   | 50 | 02/25/2020 06:51 |
| Aroclor1254               | ND     | 2.5   | 50 | 02/25/2020 06:51 |
| Aroclor1260               | ND     | 2.5   | 50 | 02/25/2020 06:51 |
| PCBs, total               | ND     | 2.5   | 50 | 02/25/2020 06:51 |

| Surrogates         | REC (%) | Limits |                  |
|--------------------|---------|--------|------------------|
| Decachlorobiphenyl | 98      | 69-143 | 02/25/2020 06:51 |

**Analyst(s):** LT

**Analytical Comments:** a3



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID                     | Lab ID        | Matrix | Date Collected      | Instrument      | Batch ID             |
|-------------------------------|---------------|--------|---------------------|-----------------|----------------------|
| S-1                           | 2002874-001A  | Soil   | 02/24/2020          | GC10 02252012.D | 194475               |
| <u>Analytes</u>               | <u>Result</u> |        | <u>RL</u> <u>DF</u> |                 | <u>Date Analyzed</u> |
| Acetone                       | ND            |        | 0.10 1              |                 | 02/25/2020 14:37     |
| tert-Amyl methyl ether (TAME) | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Benzene                       | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Bromobenzene                  | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Bromochloromethane            | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Bromodichloromethane          | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Bromoform                     | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Bromomethane                  | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 2-Butanone (MEK)              | ND            |        | 0.050 1             |                 | 02/25/2020 14:37     |
| t-Butyl alcohol (TBA)         | ND            |        | 0.050 1             |                 | 02/25/2020 14:37     |
| n-Butyl benzene               | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| sec-Butyl benzene             | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| tert-Butyl benzene            | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Carbon Disulfide              | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Carbon Tetrachloride          | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Chlorobenzene                 | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Chloroethane                  | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Chloroform                    | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Chloromethane                 | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 2-Chlorotoluene               | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 4-Chlorotoluene               | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Dibromochloromethane          | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,2-Dibromo-3-chloropropane   | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,2-Dibromoethane (EDB)       | ND            |        | 0.0040 1            |                 | 02/25/2020 14:37     |
| Dibromomethane                | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,2-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,3-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,4-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| Dichlorodifluoromethane       | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,1-Dichloroethane            | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,2-Dichloroethane (1,2-DCA)  | ND            |        | 0.0040 1            |                 | 02/25/2020 14:37     |
| 1,1-Dichloroethene            | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| cis-1,2-Dichloroethene        | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| trans-1,2-Dichloroethene      | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,2-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 1,3-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |
| 2,2-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/25/2020 14:37     |

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## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID                     | Lab ID       | Matrix        | Date Collected | Instrument      | Batch ID             |
|-------------------------------|--------------|---------------|----------------|-----------------|----------------------|
| S-1                           | 2002874-001A | Soil          | 02/24/2020     | GC10 02252012.D | 194475               |
| <u>Analytes</u>               |              | <u>Result</u> | <u>RL</u>      | <u>DF</u>       | <u>Date Analyzed</u> |
| 1,1-Dichloropropene           |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| cis-1,3-Dichloropropene       |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| trans-1,3-Dichloropropene     |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Diisopropyl ether (DIPE)      |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Ethylbenzene                  |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Ethyl tert-butyl ether (ETBE) |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Freon 113                     |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Hexachlorobutadiene           |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Hexachloroethane              |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 2-Hexanone                    |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Isopropylbenzene              |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 4-Isopropyl toluene           |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Methyl-t-butyl ether (MTBE)   |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Methylene chloride            |              | ND            | 0.020          | 1               | 02/25/2020 14:37     |
| 4-Methyl-2-pentanone (MIBK)   |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Naphthalene                   |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| n-Propyl benzene              |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Styrene                       |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,1,1,2-Tetrachloroethane     |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,1,1,2,2-Tetrachloroethane   |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Tetrachloroethene             |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Toluene                       |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,2,3-Trichlorobenzene        |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,2,4-Trichlorobenzene        |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,1,1-Trichloroethane         |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,1,2-Trichloroethane         |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Trichloroethene               |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Trichlorofluoromethane        |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,2,3-Trichloropropane        |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,2,4-Trimethylbenzene        |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| 1,3,5-Trimethylbenzene        |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Vinyl Chloride                |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| m,p-Xylene                    |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| o-Xylene                      |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |
| Xylenes, Total                |              | ND            | 0.0050         | 1               | 02/25/2020 14:37     |

(Cont.)



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-1       | 2002874-001A | Soil   | 02/24/2020     | GC10 02252012.D | 194475   |

| Analytes             | Result         | RL            | DF | Date Analyzed    |
|----------------------|----------------|---------------|----|------------------|
| <u>Surrogates</u>    | <u>REC (%)</u> | <u>Limits</u> |    |                  |
| Dibromofluoromethane | 89             | 66-116        |    | 02/25/2020 14:37 |
| Toluene-d8           | 108            | 86-110        |    | 02/25/2020 14:37 |
| 4-BFB                | 89             | 71-114        |    | 02/25/2020 14:37 |
| Benzene-d6           | 76             | 62-122        |    | 02/25/2020 14:37 |
| Ethylbenzene-d10     | 94             | 69-130        |    | 02/25/2020 14:37 |
| 1,2-DCB-d4           | 72             | 55-108        |    | 02/25/2020 14:37 |

Analyst(s): KF



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID                     | Lab ID        | Matrix | Date Collected      | Instrument      | Batch ID             |
|-------------------------------|---------------|--------|---------------------|-----------------|----------------------|
| S-2                           | 2002874-002A  | Soil   | 02/24/2020          | GC38 02272030.D | 194475               |
| <u>Analytes</u>               | <u>Result</u> |        | <u>RL</u> <u>DF</u> |                 | <u>Date Analyzed</u> |
| Acetone                       | ND            |        | 0.10 1              |                 | 02/28/2020 02:52     |
| tert-Amyl methyl ether (TAME) | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Benzene                       | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Bromobenzene                  | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Bromochloromethane            | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Bromodichloromethane          | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Bromoform                     | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Bromomethane                  | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 2-Butanone (MEK)              | ND            |        | 0.050 1             |                 | 02/28/2020 02:52     |
| t-Butyl alcohol (TBA)         | ND            |        | 0.050 1             |                 | 02/28/2020 02:52     |
| n-Butyl benzene               | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| sec-Butyl benzene             | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| tert-Butyl benzene            | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Carbon Disulfide              | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Carbon Tetrachloride          | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Chlorobenzene                 | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Chloroethane                  | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Chloroform                    | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Chloromethane                 | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 2-Chlorotoluene               | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 4-Chlorotoluene               | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Dibromochloromethane          | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2-Dibromo-3-chloropropane   | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2-Dibromoethane (EDB)       | ND            |        | 0.0040 1            |                 | 02/28/2020 02:52     |
| Dibromomethane                | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,3-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,4-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Dichlorodifluoromethane       | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,1-Dichloroethane            | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2-Dichloroethane (1,2-DCA)  | ND            |        | 0.0040 1            |                 | 02/28/2020 02:52     |
| 1,1-Dichloroethene            | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| cis-1,2-Dichloroethene        | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| trans-1,2-Dichloroethene      | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,3-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 2,2-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |

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## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID                     | Lab ID        | Matrix | Date Collected      | Instrument      | Batch ID             |
|-------------------------------|---------------|--------|---------------------|-----------------|----------------------|
| S-2                           | 2002874-002A  | Soil   | 02/24/2020          | GC38 02272030.D | 194475               |
| <u>Analytes</u>               | <u>Result</u> |        | <u>RL</u> <u>DF</u> |                 | <u>Date Analyzed</u> |
| 1,1-Dichloropropene           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| cis-1,3-Dichloropropene       | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| trans-1,3-Dichloropropene     | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Diisopropyl ether (DIPE)      | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Ethylbenzene                  | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Ethyl tert-butyl ether (ETBE) | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Freon 113                     | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Hexachlorobutadiene           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Hexachloroethane              | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 2-Hexanone                    | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Isopropylbenzene              | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 4-Isopropyl toluene           | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Methyl-t-butyl ether (MTBE)   | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Methylene chloride            | ND            |        | 0.020 1             |                 | 02/28/2020 02:52     |
| 4-Methyl-2-pentanone (MIBK)   | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Naphthalene                   | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| n-Propyl benzene              | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Styrene                       | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,1,1,2-Tetrachloroethane     | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,1,2,2-Tetrachloroethane     | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Tetrachloroethene             | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Toluene                       | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2,3-Trichlorobenzene        | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2,4-Trichlorobenzene        | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,1,1-Trichloroethane         | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,1,2-Trichloroethane         | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Trichloroethene               | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Trichlorofluoromethane        | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2,3-Trichloropropane        | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,2,4-Trimethylbenzene        | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| 1,3,5-Trimethylbenzene        | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Vinyl Chloride                | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| m,p-Xylene                    | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| o-Xylene                      | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |
| Xylenes, Total                | ND            |        | 0.0050 1            |                 | 02/28/2020 02:52     |

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## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-2       | 2002874-002A | Soil   | 02/24/2020     | GC38 02272030.D | 194475   |

| Analytes             | Result         | RL            | DF | Date Analyzed    |
|----------------------|----------------|---------------|----|------------------|
| <u>Surrogates</u>    | <u>REC (%)</u> | <u>Limits</u> |    |                  |
| Dibromofluoromethane | 100            | 66-116        |    | 02/28/2020 02:52 |
| Toluene-d8           | 101            | 86-110        |    | 02/28/2020 02:52 |
| 4-BFB                | 87             | 71-114        |    | 02/28/2020 02:52 |
| Benzene-d6           | 69             | 62-122        |    | 02/28/2020 02:52 |
| Ethylbenzene-d10     | 81             | 69-130        |    | 02/28/2020 02:52 |
| 1,2-DCB-d4           | 69             | 55-108        |    | 02/28/2020 02:52 |

Analyst(s): KF



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID                     | Lab ID        | Matrix | Date Collected      | Instrument      | Batch ID             |
|-------------------------------|---------------|--------|---------------------|-----------------|----------------------|
| S-3                           | 2002874-003A  | Soil   | 02/24/2020          | GC38 02272031.D | 194475               |
| <u>Analytes</u>               | <u>Result</u> |        | <u>RL</u> <u>DF</u> |                 | <u>Date Analyzed</u> |
| Acetone                       | ND            |        | 0.10 1              |                 | 02/28/2020 03:30     |
| tert-Amyl methyl ether (TAME) | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Benzene                       | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Bromobenzene                  | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Bromochloromethane            | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Bromodichloromethane          | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Bromoform                     | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Bromomethane                  | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 2-Butanone (MEK)              | ND            |        | 0.050 1             |                 | 02/28/2020 03:30     |
| t-Butyl alcohol (TBA)         | ND            |        | 0.050 1             |                 | 02/28/2020 03:30     |
| n-Butyl benzene               | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| sec-Butyl benzene             | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| tert-Butyl benzene            | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Carbon Disulfide              | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Carbon Tetrachloride          | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Chlorobenzene                 | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Chloroethane                  | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Chloroform                    | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Chloromethane                 | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 2-Chlorotoluene               | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 4-Chlorotoluene               | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Dibromochloromethane          | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,2-Dibromo-3-chloropropane   | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,2-Dibromoethane (EDB)       | ND            |        | 0.0040 1            |                 | 02/28/2020 03:30     |
| Dibromomethane                | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,2-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,3-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,4-Dichlorobenzene           | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| Dichlorodifluoromethane       | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,1-Dichloroethane            | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,2-Dichloroethane (1,2-DCA)  | ND            |        | 0.0040 1            |                 | 02/28/2020 03:30     |
| 1,1-Dichloroethene            | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| cis-1,2-Dichloroethene        | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| trans-1,2-Dichloroethene      | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,2-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 1,3-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |
| 2,2-Dichloropropane           | ND            |        | 0.0050 1            |                 | 02/28/2020 03:30     |

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## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-3       | 2002874-003A | Soil   | 02/24/2020     | GC38 02272031.D | 194475   |

| Analytes                      | Result | RL     | DF | Date Analyzed    |
|-------------------------------|--------|--------|----|------------------|
| 1,1-Dichloropropene           | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| cis-1,3-Dichloropropene       | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| trans-1,3-Dichloropropene     | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Diisopropyl ether (DIPE)      | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Ethylbenzene                  | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Ethyl tert-butyl ether (ETBE) | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Freon 113                     | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Hexachlorobutadiene           | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Hexachloroethane              | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 2-Hexanone                    | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Isopropylbenzene              | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 4-Isopropyl toluene           | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Methyl-t-butyl ether (MTBE)   | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Methylene chloride            | ND     | 0.020  | 1  | 02/28/2020 03:30 |
| 4-Methyl-2-pentanone (MIBK)   | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Naphthalene                   | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| n-Propyl benzene              | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Styrene                       | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,1,1,2-Tetrachloroethane     | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,1,2,2-Tetrachloroethane     | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Tetrachloroethene             | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Toluene                       | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,2,3-Trichlorobenzene        | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,2,4-Trichlorobenzene        | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,1,1-Trichloroethane         | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,1,2-Trichloroethane         | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Trichloroethene               | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Trichlorofluoromethane        | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,2,3-Trichloropropane        | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,2,4-Trimethylbenzene        | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| 1,3,5-Trimethylbenzene        | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Vinyl Chloride                | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| m,p-Xylene                    | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| o-Xylene                      | ND     | 0.0050 | 1  | 02/28/2020 03:30 |
| Xylenes, Total                | ND     | 0.0050 | 1  | 02/28/2020 03:30 |

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## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg

### Volatile Organics

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-3       | 2002874-003A | Soil   | 02/24/2020     | GC38 02272031.D | 194475   |

| Analytes             | Result         | RL            | DF | Date Analyzed    |
|----------------------|----------------|---------------|----|------------------|
| <u>Surrogates</u>    | <u>REC (%)</u> | <u>Limits</u> |    |                  |
| Dibromofluoromethane | 100            | 66-116        |    | 02/28/2020 03:30 |
| Toluene-d8           | 102            | 86-110        |    | 02/28/2020 03:30 |
| 4-BFB                | 88             | 71-114        |    | 02/28/2020 03:30 |
| Benzene-d6           | 67             | 62-122        |    | 02/28/2020 03:30 |
| Ethylbenzene-d10     | 78             | 69-130        |    | 02/28/2020 03:30 |
| 1,2-DCB-d4           | 66             | 55-108        |    | 02/28/2020 03:30 |

Analyst(s): KF



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID                     | Lab ID       | Matrix | Date Collected |                  | Instrument      | Batch ID |
|-------------------------------|--------------|--------|----------------|------------------|-----------------|----------|
| S-1                           | 2002874-001A | Soil   | 02/24/2020     |                  | GC17 02252017.D | 194583   |
| Analytes                      | Result       | RL     | DE             | Date Analyzed    |                 |          |
| Acenaphthene                  | ND           | 0.021  | 2              | 02/25/2020 16:56 |                 |          |
| Acenaphthylene                | ND           | 0.021  | 2              | 02/25/2020 16:56 |                 |          |
| Acetochlor                    | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| Anthracene                    | ND           | 0.021  | 2              | 02/25/2020 16:56 |                 |          |
| Benzidine                     | ND           | 20     | 2              | 02/25/2020 16:56 |                 |          |
| Benzo (a) anthracene          | ND           | 0.080  | 2              | 02/25/2020 16:56 |                 |          |
| Benzo (a) pyrene              | ND           | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| Benzo (b) fluoranthene        | ND           | 0.10   | 2              | 02/25/2020 16:56 |                 |          |
| Benzo (g,h,i) perylene        | 0.042        | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| Benzo (k) fluoranthene        | 0.025        | 0.021  | 2              | 02/25/2020 16:56 |                 |          |
| Benzyl Alcohol                | ND           | 20     | 2              | 02/25/2020 16:56 |                 |          |
| 1,1-Biphenyl                  | ND           | 0.21   | 2              | 02/25/2020 16:56 |                 |          |
| Bis (2-chloroethoxy) Methane  | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| Bis (2-chloroethyl) Ether     | ND           | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| Bis (2-chloroisopropyl) Ether | ND           | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| Bis (2-ethylhexyl) Adipate    | ND           | 8.0    | 2              | 02/25/2020 16:56 |                 |          |
| Bis (2-ethylhexyl) Phthalate  | ND           | 0.080  | 2              | 02/25/2020 16:56 |                 |          |
| 4-Bromophenyl Phenyl Ether    | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| Butylbenzyl Phthalate         | ND           | 0.40   | 2              | 02/25/2020 16:56 |                 |          |
| 4-Chloroaniline               | ND           | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| 4-Chloro-3-methylphenol       | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| 2-Chloronaphthalene           | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| 2-Chlorophenol                | ND           | 0.080  | 2              | 02/25/2020 16:56 |                 |          |
| 4-Chlorophenyl Phenyl Ether   | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| Chrysene                      | ND           | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| Dibenzo (a,h) anthracene      | ND           | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| Dibenzofuran                  | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| Di-n-butyl Phthalate          | ND           | 0.080  | 2              | 02/25/2020 16:56 |                 |          |
| 1,2-Dichlorobenzene           | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| 1,3-Dichlorobenzene           | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| 1,4-Dichlorobenzene           | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| 3,3-Dichlorobenzidine         | ND           | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| 2,4-Dichlorophenol            | ND           | 0.21   | 2              | 02/25/2020 16:56 |                 |          |
| Diethyl Phthalate             | ND           | 0.080  | 2              | 02/25/2020 16:56 |                 |          |
| 2,4-Dimethylphenol            | ND           | 4.0    | 2              | 02/25/2020 16:56 |                 |          |
| Dimethyl Phthalate            | ND           | 0.040  | 2              | 02/25/2020 16:56 |                 |          |
| 4,6-Dinitro-2-methylphenol    | ND           | 20     | 2              | 02/25/2020 16:56 |                 |          |

(Cont.)



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID                       | Lab ID        | Matrix | Date Collected |           | Instrument           | Batch ID |
|---------------------------------|---------------|--------|----------------|-----------|----------------------|----------|
| S-1                             | 2002874-001A  | Soil   | 02/24/2020     |           | GC17 02252017.D      | 194583   |
| <u>Analytes</u>                 | <u>Result</u> |        | <u>RL</u>      | <u>DE</u> | <u>Date Analyzed</u> |          |
| 2,4-Dinitrophenol               | ND            |        | 2.1            | 2         | 02/25/2020 16:56     |          |
| 2,4-Dinitrotoluene              | ND            |        | 0.10           | 2         | 02/25/2020 16:56     |          |
| 2,6-Dinitrotoluene              | ND            |        | 0.040          | 2         | 02/25/2020 16:56     |          |
| Di-n-octyl Phthalate            | ND            |        | 0.080          | 2         | 02/25/2020 16:56     |          |
| 1,2-Diphenylhydrazine           | ND            |        | 4.0            | 2         | 02/25/2020 16:56     |          |
| Fluoranthene                    | 0.044         |        | 0.021          | 2         | 02/25/2020 16:56     |          |
| Fluorene                        | ND            |        | 0.040          | 2         | 02/25/2020 16:56     |          |
| Hexachlorobenzene               | ND            |        | 0.021          | 2         | 02/25/2020 16:56     |          |
| Hexachlorobutadiene             | ND            |        | 0.040          | 2         | 02/25/2020 16:56     |          |
| Hexachlorocyclopentadiene       | ND            |        | 32             | 2         | 02/25/2020 16:56     |          |
| Hexachloroethane                | ND            |        | 0.040          | 2         | 02/25/2020 16:56     |          |
| Indeno (1,2,3-cd) pyrene        | ND            |        | 0.040          | 2         | 02/25/2020 16:56     |          |
| Isophorone                      | ND            |        | 4.0            | 2         | 02/25/2020 16:56     |          |
| 1-Methylnaphthalene             | ND            |        | 0.021          | 2         | 02/25/2020 16:56     |          |
| 2-Methylnaphthalene             | ND            |        | 0.040          | 2         | 02/25/2020 16:56     |          |
| 2-Methylphenol (o-Cresol)       | ND            |        | 8.0            | 2         | 02/25/2020 16:56     |          |
| 3 & 4-Methylphenol (m,p-Cresol) | ND            |        | 4.0            | 2         | 02/25/2020 16:56     |          |
| Naphthalene                     | ND            |        | 0.021          | 2         | 02/25/2020 16:56     |          |
| 2-Nitroaniline                  | ND            |        | 20             | 2         | 02/25/2020 16:56     |          |
| 3-Nitroaniline                  | ND            |        | 20             | 2         | 02/25/2020 16:56     |          |
| 4-Nitroaniline                  | ND            |        | 20             | 2         | 02/25/2020 16:56     |          |
| Nitrobenzene                    | ND            |        | 4.0            | 2         | 02/25/2020 16:56     |          |
| 2-Nitrophenol                   | ND            |        | 20             | 2         | 02/25/2020 16:56     |          |
| 4-Nitrophenol                   | ND            |        | 20             | 2         | 02/25/2020 16:56     |          |
| N-Nitrosodiphenylamine          | ND            |        | 4.0            | 2         | 02/25/2020 16:56     |          |
| N-Nitrosodi-n-propylamine       | ND            |        | 4.0            | 2         | 02/25/2020 16:56     |          |
| Pentachlorophenol               | ND            |        | 0.50           | 2         | 02/25/2020 16:56     |          |
| Phenanthrene                    | ND            |        | 0.080          | 2         | 02/25/2020 16:56     |          |
| Phenol                          | ND            |        | 0.080          | 2         | 02/25/2020 16:56     |          |
| Pyrene                          | 0.044         |        | 0.040          | 2         | 02/25/2020 16:56     |          |
| Pyridine                        | ND            |        | 4.0            | 2         | 02/25/2020 16:56     |          |
| 1,2,4-Trichlorobenzene          | ND            |        | 4.0            | 2         | 02/25/2020 16:56     |          |
| 2,4,5-Trichlorophenol           | ND            |        | 0.040          | 2         | 02/25/2020 16:56     |          |
| 2,4,6-Trichlorophenol           | ND            |        | 0.21           | 2         | 02/25/2020 16:56     |          |

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## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-1       | 2002874-001A | Soil   | 02/24/2020     | GC17 02252017.D | 194583   |

|                 |               |           |           |                      |
|-----------------|---------------|-----------|-----------|----------------------|
| <u>Analytes</u> | <u>Result</u> | <u>RL</u> | <u>DE</u> | <u>Date Analyzed</u> |
|-----------------|---------------|-----------|-----------|----------------------|

| <u>Surrogates</u>    | <u>REC (%)</u> | <u>Limits</u> |                  |
|----------------------|----------------|---------------|------------------|
| 2-Fluorophenol       | 114            | 56-152        | 02/25/2020 16:56 |
| Phenol-d5            | 100            | 54-146        | 02/25/2020 16:56 |
| Nitrobenzene-d5      | 93             | 47-147        | 02/25/2020 16:56 |
| 2-Fluorobiphenyl     | 81             | 46-141        | 02/25/2020 16:56 |
| 2,4,6-Tribromophenol | 71             | 25-166        | 02/25/2020 16:56 |
| 4-Terphenyl-d14      | 67             | 39-153        | 02/25/2020 16:56 |

Analyst(s): REB

Analytical Comments: a4



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID                     | Lab ID       | Matrix     | Date Collected |    | Instrument       | Batch ID |
|-------------------------------|--------------|------------|----------------|----|------------------|----------|
| S-2                           | 2002874-002A | Soil       | 02/24/2020     |    | GC17 02252018.D  | 194583   |
| Analytes                      | Result       | Qualifiers | RL             | DE | Date Analyzed    |          |
| Acenaphthene                  | 0.028        |            | 0.021          | 2  | 02/25/2020 17:24 |          |
| Acenaphthylene                | ND           |            | 0.021          | 2  | 02/25/2020 17:24 |          |
| Acetochlor                    | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Anthracene                    | 0.078        |            | 0.021          | 2  | 02/25/2020 17:24 |          |
| Benzidine                     | ND           |            | 20             | 2  | 02/25/2020 17:24 |          |
| Benzo (a) anthracene          | 0.14         |            | 0.080          | 2  | 02/25/2020 17:24 |          |
| Benzo (a) pyrene              | 0.061        |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Benzo (b) fluoranthene        | ND           |            | 0.10           | 2  | 02/25/2020 17:24 |          |
| Benzo (g,h,i) perylene        | 0.041        |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Benzo (k) fluoranthene        | 0.046        |            | 0.021          | 2  | 02/25/2020 17:24 |          |
| Benzyl Alcohol                | ND           |            | 20             | 2  | 02/25/2020 17:24 |          |
| 1,1-Biphenyl                  | ND           |            | 0.21           | 2  | 02/25/2020 17:24 |          |
| Bis (2-chloroethoxy) Methane  | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Bis (2-chloroethyl) Ether     | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Bis (2-chloroisopropyl) Ether | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Bis (2-ethylhexyl) Adipate    | ND           |            | 8.0            | 2  | 02/25/2020 17:24 |          |
| Bis (2-ethylhexyl) Phthalate  | ND           |            | 0.080          | 2  | 02/25/2020 17:24 |          |
| 4-Bromophenyl Phenyl Ether    | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Butylbenzyl Phthalate         | ND           |            | 0.40           | 2  | 02/25/2020 17:24 |          |
| 4-Chloroaniline               | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| 4-Chloro-3-methylphenol       | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 2-Chloronaphthalene           | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 2-Chlorophenol                | ND           |            | 0.080          | 2  | 02/25/2020 17:24 |          |
| 4-Chlorophenyl Phenyl Ether   | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Chrysene                      | 0.11         | B          | 0.040          | 2  | 02/25/2020 17:24 |          |
| Dibenzo (a,h) anthracene      | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Dibenzofuran                  | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Di-n-butyl Phthalate          | ND           |            | 0.080          | 2  | 02/25/2020 17:24 |          |
| 1,2-Dichlorobenzene           | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 1,3-Dichlorobenzene           | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 1,4-Dichlorobenzene           | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 3,3-Dichlorobenzidine         | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| 2,4-Dichlorophenol            | ND           |            | 0.21           | 2  | 02/25/2020 17:24 |          |
| Diethyl Phthalate             | ND           |            | 0.080          | 2  | 02/25/2020 17:24 |          |
| 2,4-Dimethylphenol            | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Dimethyl Phthalate            | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| 4,6-Dinitro-2-methylphenol    | ND           |            | 20             | 2  | 02/25/2020 17:24 |          |

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## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID                       | Lab ID       | Matrix     | Date Collected |    | Instrument       | Batch ID |
|---------------------------------|--------------|------------|----------------|----|------------------|----------|
| S-2                             | 2002874-002A | Soil       | 02/24/2020     |    | GC17 02252018.D  | 194583   |
| Analytes                        | Result       | Qualifiers | RL             | DE | Date Analyzed    |          |
| 2,4-Dinitrophenol               | ND           |            | 2.1            | 2  | 02/25/2020 17:24 |          |
| 2,4-Dinitrotoluene              | ND           |            | 0.10           | 2  | 02/25/2020 17:24 |          |
| 2,6-Dinitrotoluene              | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Di-n-octyl Phthalate            | ND           |            | 0.080          | 2  | 02/25/2020 17:24 |          |
| 1,2-Diphenylhydrazine           | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Fluoranthene                    | 0.24         | B          | 0.021          | 2  | 02/25/2020 17:24 |          |
| Fluorene                        | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Hexachlorobenzene               | ND           |            | 0.021          | 2  | 02/25/2020 17:24 |          |
| Hexachlorobutadiene             | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Hexachlorocyclopentadiene       | ND           |            | 32             | 2  | 02/25/2020 17:24 |          |
| Hexachloroethane                | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Indeno (1,2,3-cd) pyrene        | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Isophorone                      | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 1-Methylnaphthalene             | ND           |            | 0.021          | 2  | 02/25/2020 17:24 |          |
| 2-Methylnaphthalene             | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| 2-Methylphenol (o-Cresol)       | ND           |            | 8.0            | 2  | 02/25/2020 17:24 |          |
| 3 & 4-Methylphenol (m,p-Cresol) | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Naphthalene                     | ND           |            | 0.021          | 2  | 02/25/2020 17:24 |          |
| 2-Nitroaniline                  | ND           |            | 20             | 2  | 02/25/2020 17:24 |          |
| 3-Nitroaniline                  | ND           |            | 20             | 2  | 02/25/2020 17:24 |          |
| 4-Nitroaniline                  | ND           |            | 20             | 2  | 02/25/2020 17:24 |          |
| Nitrobenzene                    | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 2-Nitrophenol                   | ND           |            | 20             | 2  | 02/25/2020 17:24 |          |
| 4-Nitrophenol                   | ND           |            | 20             | 2  | 02/25/2020 17:24 |          |
| N-Nitrosodiphenylamine          | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| N-Nitrosodi-n-propylamine       | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| Pentachlorophenol               | ND           |            | 0.50           | 2  | 02/25/2020 17:24 |          |
| Phenanthrene                    | 0.27         |            | 0.080          | 2  | 02/25/2020 17:24 |          |
| Phenol                          | ND           |            | 0.080          | 2  | 02/25/2020 17:24 |          |
| Pyrene                          | 0.19         |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| Pyridine                        | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 1,2,4-Trichlorobenzene          | ND           |            | 4.0            | 2  | 02/25/2020 17:24 |          |
| 2,4,5-Trichlorophenol           | ND           |            | 0.040          | 2  | 02/25/2020 17:24 |          |
| 2,4,6-Trichlorophenol           | ND           |            | 0.21           | 2  | 02/25/2020 17:24 |          |

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## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-2       | 2002874-002A | Soil   | 02/24/2020     | GC17 02252018.D | 194583   |

|                 |               |                   |           |           |                      |
|-----------------|---------------|-------------------|-----------|-----------|----------------------|
| <u>Analytes</u> | <u>Result</u> | <u>Qualifiers</u> | <u>RL</u> | <u>DE</u> | <u>Date Analyzed</u> |
|-----------------|---------------|-------------------|-----------|-----------|----------------------|

| <u>Surrogates</u>    | <u>REC (%)</u> | <u>Limits</u> |                  |
|----------------------|----------------|---------------|------------------|
| 2-Fluorophenol       | 142            | 56-152        | 02/25/2020 17:24 |
| Phenol-d5            | 108            | 54-146        | 02/25/2020 17:24 |
| Nitrobenzene-d5      | 82             | 47-147        | 02/25/2020 17:24 |
| 2-Fluorobiphenyl     | 82             | 46-141        | 02/25/2020 17:24 |
| 2,4,6-Tribromophenol | 73             | 25-166        | 02/25/2020 17:24 |
| 4-Terphenyl-d14      | 66             | 39-153        | 02/25/2020 17:24 |

Analyst(s): REB

Analytical Comments: a4,c2



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID                     | Lab ID       | Matrix     | Date Collected |    | Instrument       | Batch ID |
|-------------------------------|--------------|------------|----------------|----|------------------|----------|
| S-3                           | 2002874-003A | Soil       | 02/24/2020     |    | GC17 02252019.D  | 194583   |
| Analytes                      | Result       | Qualifiers | RL             | DE | Date Analyzed    |          |
| Acenaphthene                  | ND           |            | 0.021          | 2  | 02/25/2020 17:51 |          |
| Acenaphthylene                | ND           |            | 0.021          | 2  | 02/25/2020 17:51 |          |
| Acetochlor                    | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Anthracene                    | 0.022        |            | 0.021          | 2  | 02/25/2020 17:51 |          |
| Benzidine                     | ND           |            | 20             | 2  | 02/25/2020 17:51 |          |
| Benzo (a) anthracene          | ND           |            | 0.080          | 2  | 02/25/2020 17:51 |          |
| Benzo (a) pyrene              | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Benzo (b) fluoranthene        | ND           |            | 0.10           | 2  | 02/25/2020 17:51 |          |
| Benzo (g,h,i) perylene        | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Benzo (k) fluoranthene        | ND           |            | 0.021          | 2  | 02/25/2020 17:51 |          |
| Benzyl Alcohol                | ND           |            | 20             | 2  | 02/25/2020 17:51 |          |
| 1,1-Biphenyl                  | ND           |            | 0.21           | 2  | 02/25/2020 17:51 |          |
| Bis (2-chloroethoxy) Methane  | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Bis (2-chloroethyl) Ether     | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Bis (2-chloroisopropyl) Ether | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Bis (2-ethylhexyl) Adipate    | ND           |            | 8.0            | 2  | 02/25/2020 17:51 |          |
| Bis (2-ethylhexyl) Phthalate  | ND           |            | 0.080          | 2  | 02/25/2020 17:51 |          |
| 4-Bromophenyl Phenyl Ether    | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Butylbenzyl Phthalate         | ND           |            | 0.40           | 2  | 02/25/2020 17:51 |          |
| 4-Chloroaniline               | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| 4-Chloro-3-methylphenol       | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 2-Chloronaphthalene           | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 2-Chlorophenol                | ND           |            | 0.080          | 2  | 02/25/2020 17:51 |          |
| 4-Chlorophenyl Phenyl Ether   | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Chrysene                      | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Dibenzo (a,h) anthracene      | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Dibenzofuran                  | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Di-n-butyl Phthalate          | ND           |            | 0.080          | 2  | 02/25/2020 17:51 |          |
| 1,2-Dichlorobenzene           | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 1,3-Dichlorobenzene           | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 1,4-Dichlorobenzene           | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 3,3-Dichlorobenzidine         | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| 2,4-Dichlorophenol            | ND           |            | 0.21           | 2  | 02/25/2020 17:51 |          |
| Diethyl Phthalate             | ND           |            | 0.080          | 2  | 02/25/2020 17:51 |          |
| 2,4-Dimethylphenol            | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Dimethyl Phthalate            | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| 4,6-Dinitro-2-methylphenol    | ND           |            | 20             | 2  | 02/25/2020 17:51 |          |

(Cont.)



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID                       | Lab ID       | Matrix     | Date Collected |    | Instrument       | Batch ID |
|---------------------------------|--------------|------------|----------------|----|------------------|----------|
| S-3                             | 2002874-003A | Soil       | 02/24/2020     |    | GC17 02252019.D  | 194583   |
| Analytes                        | Result       | Qualifiers | RL             | DE | Date Analyzed    |          |
| 2,4-Dinitrophenol               | ND           |            | 2.1            | 2  | 02/25/2020 17:51 |          |
| 2,4-Dinitrotoluene              | ND           |            | 0.10           | 2  | 02/25/2020 17:51 |          |
| 2,6-Dinitrotoluene              | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Di-n-octyl Phthalate            | ND           |            | 0.080          | 2  | 02/25/2020 17:51 |          |
| 1,2-Diphenylhydrazine           | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Fluoranthene                    | 0.076        | B          | 0.021          | 2  | 02/25/2020 17:51 |          |
| Fluorene                        | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Hexachlorobenzene               | ND           |            | 0.021          | 2  | 02/25/2020 17:51 |          |
| Hexachlorobutadiene             | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Hexachlorocyclopentadiene       | ND           |            | 32             | 2  | 02/25/2020 17:51 |          |
| Hexachloroethane                | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Indeno (1,2,3-cd) pyrene        | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Isophorone                      | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 1-Methylnaphthalene             | ND           |            | 0.021          | 2  | 02/25/2020 17:51 |          |
| 2-Methylnaphthalene             | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| 2-Methylphenol (o-Cresol)       | ND           |            | 8.0            | 2  | 02/25/2020 17:51 |          |
| 3 & 4-Methylphenol (m,p-Cresol) | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Naphthalene                     | ND           |            | 0.021          | 2  | 02/25/2020 17:51 |          |
| 2-Nitroaniline                  | ND           |            | 20             | 2  | 02/25/2020 17:51 |          |
| 3-Nitroaniline                  | ND           |            | 20             | 2  | 02/25/2020 17:51 |          |
| 4-Nitroaniline                  | ND           |            | 20             | 2  | 02/25/2020 17:51 |          |
| Nitrobenzene                    | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 2-Nitrophenol                   | ND           |            | 20             | 2  | 02/25/2020 17:51 |          |
| 4-Nitrophenol                   | ND           |            | 20             | 2  | 02/25/2020 17:51 |          |
| N-Nitrosodiphenylamine          | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| N-Nitrosodi-n-propylamine       | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| Pentachlorophenol               | ND           |            | 0.50           | 2  | 02/25/2020 17:51 |          |
| Phenanthrene                    | ND           |            | 0.080          | 2  | 02/25/2020 17:51 |          |
| Phenol                          | ND           |            | 0.080          | 2  | 02/25/2020 17:51 |          |
| Pyrene                          | 0.064        |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| Pyridine                        | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 1,2,4-Trichlorobenzene          | ND           |            | 4.0            | 2  | 02/25/2020 17:51 |          |
| 2,4,5-Trichlorophenol           | ND           |            | 0.040          | 2  | 02/25/2020 17:51 |          |
| 2,4,6-Trichlorophenol           | ND           |            | 0.21           | 2  | 02/25/2020 17:51 |          |

(Cont.)



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/25/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg

### Semi-Volatile Organics

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-3       | 2002874-003A | Soil   | 02/24/2020     | GC17 02252019.D | 194583   |

| Analytes | Result | Qualifiers | RL | DE | Date Analyzed |
|----------|--------|------------|----|----|---------------|
|----------|--------|------------|----|----|---------------|

| Surrogates           | REC (%) | Limits |                  |
|----------------------|---------|--------|------------------|
| 2-Fluorophenol       | 117     | 56-152 | 02/25/2020 17:51 |
| Phenol-d5            | 94      | 54-146 | 02/25/2020 17:51 |
| Nitrobenzene-d5      | 75      | 47-147 | 02/25/2020 17:51 |
| 2-Fluorobiphenyl     | 79      | 46-141 | 02/25/2020 17:51 |
| 2,4,6-Tribromophenol | 67      | 25-166 | 02/25/2020 17:51 |
| 4-Terphenyl-d14      | 54      | 39-153 | 02/25/2020 17:51 |

Analyst(s): REB

Analytical Comments: a4



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

| Client ID       | Lab ID        | Matrix            | Date Collected |           | Instrument           | Batch ID |
|-----------------|---------------|-------------------|----------------|-----------|----------------------|----------|
| S-1             | 2002874-001A  | Soil              | 02/24/2020     |           | ICP-MS4 174SMPL.d    | 194493   |
| <u>Analytes</u> | <u>Result</u> | <u>Qualifiers</u> | <u>RL</u>      | <u>DF</u> | <u>Date Analyzed</u> |          |
| Antimony        | 0.59          |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Arsenic         | 6.2           |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Barium          | 180           |                   | 5.0            | 1         | 02/25/2020 16:53     |          |
| Beryllium       | ND            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Cadmium         | 0.27          |                   | 0.25           | 1         | 02/25/2020 16:53     |          |
| Chromium        | 43            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Cobalt          | 10            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Copper          | 22            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Lead            | 23            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Mercury         | 0.50          | B                 | 0.050          | 1         | 02/25/2020 16:53     |          |
| Molybdenum      | ND            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Nickel          | 47            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Selenium        | 1.2           |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Silver          | ND            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Thallium        | ND            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Vanadium        | 44            |                   | 0.50           | 1         | 02/25/2020 16:53     |          |
| Zinc            | 70            |                   | 5.0            | 1         | 02/25/2020 16:53     |          |

|                   |                |               |                  |
|-------------------|----------------|---------------|------------------|
| <u>Surrogates</u> | <u>REC (%)</u> | <u>Limits</u> |                  |
| Terbium           | 91             | 70-130        | 02/25/2020 16:53 |

Analyst(s): ND



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

| Client ID       | Lab ID        | Matrix            | Date Collected | Instrument        | Batch ID             |
|-----------------|---------------|-------------------|----------------|-------------------|----------------------|
| S-2             | 2002874-002A  | Soil              | 02/24/2020     | ICP-MS4 175SMPL.d | 194493               |
| <u>Analytes</u> | <u>Result</u> | <u>Qualifiers</u> | <u>RL</u>      | <u>DF</u>         | <u>Date Analyzed</u> |
| Antimony        | 0.58          |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Arsenic         | 6.5           |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Barium          | 170           |                   | 5.0            | 1                 | 02/25/2020 16:58     |
| Beryllium       | 0.61          |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Cadmium         | ND            |                   | 0.25           | 1                 | 02/25/2020 16:58     |
| Chromium        | 67            |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Cobalt          | 12            |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Copper          | 27            |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Lead            | 14            |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Mercury         | 0.37          | B                 | 0.050          | 1                 | 02/25/2020 16:58     |
| Molybdenum      | 0.72          |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Nickel          | 72            |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Selenium        | 1.2           |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Silver          | ND            |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Thallium        | ND            |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Vanadium        | 62            |                   | 0.50           | 1                 | 02/25/2020 16:58     |
| Zinc            | 66            |                   | 5.0            | 1                 | 02/25/2020 16:58     |

|                   |                |               |                  |
|-------------------|----------------|---------------|------------------|
| <u>Surrogates</u> | <u>REC (%)</u> | <u>Limits</u> |                  |
| Terbium           | 109            | 70-130        | 02/25/2020 16:58 |

Analyst(s): ND



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

| Client ID | Lab ID       | Matrix | Date Collected | Instrument        | Batch ID |
|-----------|--------------|--------|----------------|-------------------|----------|
| S-3       | 2002874-003A | Soil   | 02/24/2020     | ICP-MS4 176SMPL.d | 194493   |

| Analytes   | Result | Qualifiers | RL    | DF | Date Analyzed    |
|------------|--------|------------|-------|----|------------------|
| Antimony   | 0.59   |            | 0.50  | 1  | 02/25/2020 17:02 |
| Arsenic    | 9.4    |            | 0.50  | 1  | 02/25/2020 17:02 |
| Barium     | 120    |            | 5.0   | 1  | 02/25/2020 17:02 |
| Beryllium  | ND     |            | 0.50  | 1  | 02/25/2020 17:02 |
| Cadmium    | 0.94   |            | 0.25  | 1  | 02/25/2020 17:02 |
| Chromium   | 44     |            | 0.50  | 1  | 02/25/2020 17:02 |
| Cobalt     | 9.3    |            | 0.50  | 1  | 02/25/2020 17:02 |
| Copper     | 130    |            | 0.50  | 1  | 02/25/2020 17:02 |
| Lead       | 37     |            | 0.50  | 1  | 02/25/2020 17:02 |
| Mercury    | 0.21   | B          | 0.050 | 1  | 02/25/2020 17:02 |
| Molybdenum | ND     |            | 0.50  | 1  | 02/25/2020 17:02 |
| Nickel     | 42     |            | 0.50  | 1  | 02/25/2020 17:02 |
| Selenium   | 1.0    |            | 0.50  | 1  | 02/25/2020 17:02 |
| Silver     | ND     |            | 0.50  | 1  | 02/25/2020 17:02 |
| Thallium   | ND     |            | 0.50  | 1  | 02/25/2020 17:02 |
| Vanadium   | 43     |            | 0.50  | 1  | 02/25/2020 17:02 |
| Zinc       | 91     |            | 5.0   | 1  | 02/25/2020 17:02 |

| Surrogates | REC (%) | Limits |                  |
|------------|---------|--------|------------------|
| Terbium    | 109     | 70-130 | 02/25/2020 17:02 |

Analyst(s): ND



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.

**Date Received:** 02/24/2020 13:04

**Date Prepared:** 02/24/2020

**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874

**Extraction Method:** CARB 435 Asbestos

**Analytical Method:** 435 CARB

**Unit:** %

### Asbestos (CARB 435) 400 Point Count

| Client ID | Lab ID       | Matrix | Date Collected | Instrument | Batch ID |
|-----------|--------------|--------|----------------|------------|----------|
| S-1       | 2002874-001A | Soil   | 02/24/2020     | Microscope | 194666   |

|                 |               |           |           |                      |
|-----------------|---------------|-----------|-----------|----------------------|
| <u>Analytes</u> | <u>Result</u> | <u>RL</u> | <u>DF</u> | <u>Date Analyzed</u> |
| Asbestos        | ND            | NA        | 1         | 02/26/2020 10:50     |

Analyst(s): DA

Analytical Comments: k10

| Client ID | Lab ID       | Matrix | Date Collected | Instrument | Batch ID |
|-----------|--------------|--------|----------------|------------|----------|
| S-2       | 2002874-002A | Soil   | 02/24/2020     | Microscope | 194666   |

|                 |               |           |           |                      |
|-----------------|---------------|-----------|-----------|----------------------|
| <u>Analytes</u> | <u>Result</u> | <u>RL</u> | <u>DF</u> | <u>Date Analyzed</u> |
| Asbestos        | ND            | NA        | 1         | 02/26/2020 11:15     |

Analyst(s): DA

Analytical Comments: k10

| Client ID | Lab ID       | Matrix | Date Collected | Instrument | Batch ID |
|-----------|--------------|--------|----------------|------------|----------|
| S-3       | 2002874-003A | Soil   | 02/24/2020     | Microscope | 194666   |

|                 |               |           |           |                      |
|-----------------|---------------|-----------|-----------|----------------------|
| <u>Analytes</u> | <u>Result</u> | <u>RL</u> | <u>DF</u> | <u>Date Analyzed</u> |
| Asbestos        | ND            | NA        | 1         | 02/26/2020 11:40     |

Analyst(s): DA

Analytical Comments: k10



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020-02/27/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW5035  
**Analytical Method:** SW8021B/8015Bm  
**Unit:** mg/Kg

### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-1       | 2002874-001A | Soil   | 02/24/2020     | GC19 02242038.D | 194495   |

| Analytes        | Result | RL     | DF | Date Analyzed    |
|-----------------|--------|--------|----|------------------|
| TPH(g) (C6-C12) | ND     | 1.0    | 1  | 02/25/2020 04:19 |
| MTBE            | ND     | 0.050  | 1  | 02/25/2020 04:19 |
| Benzene         | ND     | 0.0050 | 1  | 02/25/2020 04:19 |
| Toluene         | ND     | 0.0050 | 1  | 02/25/2020 04:19 |
| Ethylbenzene    | ND     | 0.0050 | 1  | 02/25/2020 04:19 |
| m,p-Xylene      | ND     | 0.010  | 1  | 02/25/2020 04:19 |
| o-Xylene        | ND     | 0.0050 | 1  | 02/25/2020 04:19 |
| Xylenes         | ND     | 0.0050 | 1  | 02/25/2020 04:19 |

| Surrogates      | REC (%) | Limits |                  |
|-----------------|---------|--------|------------------|
| 2-Fluorotoluene | 93      | 62-126 | 02/25/2020 04:19 |

Analyst(s): IA

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-2       | 2002874-002A | Soil   | 02/24/2020     | GC19 02242039.D | 194495   |

| Analytes        | Result | RL     | DF | Date Analyzed    |
|-----------------|--------|--------|----|------------------|
| TPH(g) (C6-C12) | ND     | 1.0    | 1  | 02/25/2020 04:49 |
| MTBE            | ND     | 0.050  | 1  | 02/25/2020 04:49 |
| Benzene         | ND     | 0.0050 | 1  | 02/25/2020 04:49 |
| Toluene         | ND     | 0.0050 | 1  | 02/25/2020 04:49 |
| Ethylbenzene    | ND     | 0.0050 | 1  | 02/25/2020 04:49 |
| m,p-Xylene      | ND     | 0.010  | 1  | 02/25/2020 04:49 |
| o-Xylene        | ND     | 0.0050 | 1  | 02/25/2020 04:49 |
| Xylenes         | ND     | 0.0050 | 1  | 02/25/2020 04:49 |

| Surrogates      | REC (%) | Limits |                  |
|-----------------|---------|--------|------------------|
| 2-Fluorotoluene | 92      | 62-126 | 02/25/2020 04:49 |

Analyst(s): IA

(Cont.)



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.

**Date Received:** 02/24/2020 13:04

**Date Prepared:** 02/24/2020-02/27/2020

**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874

**Extraction Method:** SW5035

**Analytical Method:** SW8021B/8015Bm

**Unit:** mg/Kg

### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

| Client ID | Lab ID       | Matrix | Date Collected | Instrument     | Batch ID |
|-----------|--------------|--------|----------------|----------------|----------|
| S-3       | 2002874-003A | Soil   | 02/24/2020     | GC3 02272016.D | 194701   |

| Analytes        | Result | RL     | DF | Date Analyzed    |
|-----------------|--------|--------|----|------------------|
| TPH(g) (C6-C12) | ND     | 1.0    | 1  | 02/27/2020 21:50 |
| MTBE            | ND     | 0.050  | 1  | 02/27/2020 21:50 |
| Benzene         | ND     | 0.0050 | 1  | 02/27/2020 21:50 |
| Toluene         | ND     | 0.0050 | 1  | 02/27/2020 21:50 |
| Ethylbenzene    | ND     | 0.0050 | 1  | 02/27/2020 21:50 |
| m,p-Xylene      | ND     | 0.010  | 1  | 02/27/2020 21:50 |
| o-Xylene        | ND     | 0.0050 | 1  | 02/27/2020 21:50 |
| Xylenes         | ND     | 0.0050 | 1  | 02/27/2020 21:50 |

| Surrogates      | REC (%) | Limits | Date Analyzed    |
|-----------------|---------|--------|------------------|
| 2-Fluorotoluene | 91      | 62-126 | 02/27/2020 21:50 |

**Analyst(s):** IA



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Received:** 02/24/2020 13:04  
**Date Prepared:** 02/24/2020  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8015B  
**Unit:** mg/Kg

### Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

| Client ID | Lab ID       | Matrix | Date Collected | Instrument       | Batch ID |
|-----------|--------------|--------|----------------|------------------|----------|
| S-1       | 2002874-001A | Soil   | 02/24/2020     | GC31A 03022018.D | 194496   |

| Analytes                | Result | RL  | DF | Date Analyzed    |
|-------------------------|--------|-----|----|------------------|
| TPH-Diesel (C10-C23)    | 17     | 1.0 | 1  | 03/02/2020 15:12 |
| TPH-Motor Oil (C18-C36) | 140    | 5.0 | 1  | 03/02/2020 15:12 |

| Surrogates | REC (%) | Limits |                  |
|------------|---------|--------|------------------|
| C9         | 102     | 70-130 | 03/02/2020 15:12 |

Analyst(s): JIS

Analytical Comments: e7,e2,e8

| Client ID | Lab ID       | Matrix | Date Collected | Instrument       | Batch ID |
|-----------|--------------|--------|----------------|------------------|----------|
| S-2       | 2002874-002A | Soil   | 02/24/2020     | GC31B 02252027.D | 194496   |

| Analytes                | Result | RL  | DF | Date Analyzed    |
|-------------------------|--------|-----|----|------------------|
| TPH-Diesel (C10-C23)    | 8.7    | 2.0 | 2  | 02/25/2020 18:35 |
| TPH-Motor Oil (C18-C36) | 71     | 10  | 2  | 02/25/2020 18:35 |

| Surrogates | REC (%) | Limits |                  |
|------------|---------|--------|------------------|
| C9         | 92      | 70-130 | 02/25/2020 18:35 |

Analyst(s): JIS

Analytical Comments: e7,e2,e8

| Client ID | Lab ID       | Matrix | Date Collected | Instrument      | Batch ID |
|-----------|--------------|--------|----------------|-----------------|----------|
| S-3       | 2002874-003A | Soil   | 02/24/2020     | GC9b 03022017.D | 194496   |

| Analytes                | Result | RL  | DF | Date Analyzed    |
|-------------------------|--------|-----|----|------------------|
| TPH-Diesel (C10-C23)    | 3.2    | 1.0 | 1  | 03/02/2020 15:14 |
| TPH-Motor Oil (C18-C36) | 88     | 5.0 | 1  | 03/02/2020 15:14 |

| Surrogates | REC (%) | Limits |                  |
|------------|---------|--------|------------------|
| C9         | 88      | 70-130 | 03/02/2020 15:14 |

Analyst(s): JIS

Analytical Comments: e7,e2



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/25/2020  
**Instrument:** GC23  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194497  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8081A/8082  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194497  
2002874-001AMS/MSD

### QC Summary Report for SW8081A/8082

| Analyte                   | MB Result | MDL       | RL      | SPK Val | MB SS %REC | MB SS Limits |
|---------------------------|-----------|-----------|---------|---------|------------|--------------|
| Aldrin                    | ND        | 0.000270  | 0.00100 | -       | -          | -            |
| a-BHC                     | ND        | 0.000100  | 0.00100 | -       | -          | -            |
| b-BHC                     | ND        | 0.000250  | 0.00100 | -       | -          | -            |
| d-BHC                     | ND        | 0.000370  | 0.00100 | -       | -          | -            |
| g-BHC                     | ND        | 0.0000970 | 0.00100 | -       | -          | -            |
| Chlordane (Technical)     | ND        | 0.0160    | 0.0250  | -       | -          | -            |
| a-Chlordane               | ND        | 0.000470  | 0.00100 | -       | -          | -            |
| g-Chlordane               | ND        | 0.000210  | 0.00100 | -       | -          | -            |
| p,p-DDD                   | ND        | 0.000140  | 0.00100 | -       | -          | -            |
| p,p-DDE                   | ND        | 0.000320  | 0.00100 | -       | -          | -            |
| p,p-DDT                   | ND        | 0.000430  | 0.00100 | -       | -          | -            |
| Dieldrin                  | ND        | 0.000330  | 0.00100 | -       | -          | -            |
| Endosulfan I              | ND        | 0.000650  | 0.00100 | -       | -          | -            |
| Endosulfan II             | ND        | 0.000200  | 0.00100 | -       | -          | -            |
| Endosulfan sulfate        | ND        | 0.000630  | 0.00100 | -       | -          | -            |
| Endrin                    | ND        | 0.000420  | 0.00100 | -       | -          | -            |
| Endrin aldehyde           | ND        | 0.000200  | 0.00100 | -       | -          | -            |
| Endrin ketone             | ND        | 0.000130  | 0.00100 | -       | -          | -            |
| Heptachlor                | ND        | 0.000210  | 0.00100 | -       | -          | -            |
| Heptachlor epoxide        | ND        | 0.000200  | 0.00100 | -       | -          | -            |
| Hexachlorobenzene         | ND        | 0.000270  | 0.0100  | -       | -          | -            |
| Hexachlorocyclopentadiene | ND        | 0.000400  | 0.0200  | -       | -          | -            |
| Methoxychlor              | ND        | 0.000890  | 0.00100 | -       | -          | -            |
| Toxaphene                 | ND        | 0.0350    | 0.0500  | -       | -          | -            |
| Aroclor1016               | ND        | 0.00510   | 0.0500  | -       | -          | -            |
| Aroclor1221               | ND        | 0.0110    | 0.0500  | -       | -          | -            |
| Aroclor1232               | ND        | 0.00630   | 0.0500  | -       | -          | -            |
| Aroclor1242               | ND        | 0.00670   | 0.0500  | -       | -          | -            |
| Aroclor1248               | ND        | 0.00400   | 0.0500  | -       | -          | -            |
| Aroclor1254               | ND        | 0.00680   | 0.0500  | -       | -          | -            |
| Aroclor1260               | ND        | 0.00610   | 0.0500  | -       | -          | -            |
| <b>Surrogate Recovery</b> |           |           |         |         |            |              |
| Decachlorobiphenyl        | 0.0531    |           |         | 0.05    | 106        | 75-136       |

(Cont.)



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/25/2020  
**Instrument:** GC23  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194497  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8081A/8082  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194497  
2002874-001AMS/MSD

### QC Summary Report for SW8081A/8082

| Analyte                   | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD   | RPD Limit |
|---------------------------|------------|-------------|---------|----------|-----------|-----------------|-------|-----------|
| Aldrin                    | 0.0583     | 0.0608      | 0.050   | 117      | 122       | 92-133          | 4.19  | 20        |
| a-BHC                     | 0.0532     | 0.0550      | 0.050   | 106      | 110       | 96-140          | 3.43  | 20        |
| b-BHC                     | 0.0568     | 0.0591      | 0.050   | 114      | 118       | 77-137          | 3.99  | 20        |
| d-BHC                     | 0.0616     | 0.0649      | 0.050   | 123      | 130       | 89-145          | 5.26  | 20        |
| g-BHC                     | 0.0532     | 0.0556      | 0.050   | 106      | 111       | 92-134          | 4.44  | 20        |
| a-Chlordane               | 0.0497     | 0.0522      | 0.050   | 99       | 104       | 72-134          | 4.90  | 20        |
| g-Chlordane               | 0.0551     | 0.0581      | 0.050   | 110      | 116       | 86-132          | 5.19  | 20        |
| p,p-DDD                   | 0.0465     | 0.0499      | 0.050   | 93       | 100       | 35-140          | 7.05  | 20        |
| p,p-DDE                   | 0.0531     | 0.0564      | 0.050   | 106      | 113       | 83-138          | 5.96  | 20        |
| p,p-DDT                   | 0.0517     | 0.0563      | 0.050   | 103      | 113       | 70-137          | 8.47  | 20        |
| Dieldrin                  | 0.0509     | 0.0538      | 0.050   | 102      | 108       | 99-141          | 5.60  | 20        |
| Endosulfan I              | 0.0481     | 0.0506      | 0.050   | 96       | 101       | 93-121          | 5.07  | 20        |
| Endosulfan II             | 0.0485     | 0.0517      | 0.050   | 97       | 103       | 74-125          | 6.34  | 20        |
| Endosulfan sulfate        | 0.0515     | 0.0556      | 0.050   | 103      | 111       | 66-138          | 7.63  | 20        |
| Endrin                    | 0.0467     | 0.0499      | 0.050   | 93       | 100       | 92-137          | 6.56  | 20        |
| Endrin aldehyde           | 0.0466     | 0.0499      | 0.050   | 93       | 100       | 77-135          | 6.76  | 20        |
| Endrin ketone             | 0.0487     | 0.0519      | 0.050   | 97       | 104       | 72-126          | 6.47  | 20        |
| Heptachlor                | 0.0550     | 0.0587      | 0.050   | 110      | 117       | 89-136          | 6.38  | 20        |
| Heptachlor epoxide        | 0.0522     | 0.0546      | 0.050   | 104      | 109       | 85-121          | 4.43  | 20        |
| Hexachlorobenzene         | 0.0461     | 0.0485      | 0.050   | 92       | 97        | 87-127          | 4.99  | 20        |
| Hexachlorocyclopentadiene | 0.0489     | 0.0520      | 0.050   | 98       | 104       | 41-145          | 6.01  | 20        |
| Methoxychlor              | 0.0472     | 0.0510      | 0.050   | 94       | 102       | 82-142          | 7.66  | 20        |
| Aroclor1016               | 0.161      | 0.159       | 0.15    | 107      | 106       | 90-125          | 0.877 | 20        |
| Aroclor1260               | 0.161      | 0.160       | 0.15    | 108      | 107       | 77-122          | 0.881 | 20        |

#### Surrogate Recovery

|                    |        |        |       |     |     |        |      |    |
|--------------------|--------|--------|-------|-----|-----|--------|------|----|
| Decachlorobiphenyl | 0.0498 | 0.0519 | 0.050 | 100 | 104 | 75-136 | 3.96 | 20 |
|--------------------|--------|--------|-------|-----|-----|--------|------|----|

| Analyte     | MS DF | MS Result | MSD Result | SPK Val | SPKRef Val | MS %REC | MSD %REC | MS/MSD Limits | RPD  | RPD Limit |
|-------------|-------|-----------|------------|---------|------------|---------|----------|---------------|------|-----------|
| Aldrin      | 100   | 0.0439    | 0.0502     | 0.050   | ND<0.10    | 88      | 100      | 59-143        | 13.3 | 20        |
| a-BHC       | 100   | 0.0371    | 0.0424     | 0.050   | ND<0.10    | 74      | 85       | 42-159        | 13.3 | 20        |
| b-BHC       | 100   | 0.0565    | 0.0652     | 0.050   | ND<0.10    | 113     | 130      | 67-141        | 14.4 | 20        |
| d-BHC       | 100   | 0.0395    | 0.0463     | 0.050   | ND<0.10    | 79      | 93       | 38-164        | 15.7 | 20        |
| g-BHC       | 100   | 0.0361    | 0.0423     | 0.050   | ND<0.10    | 72      | 85       | 51-148        | 15.8 | 20        |
| a-Chlordane | 100   | 0.0706    | 0.0765     | 0.050   | ND<0.10    | 141,F1  | 153,F1   | 70-130        | 7.96 | 20        |
| g-Chlordane | 100   | 0.0888    | 0.0948     | 0.050   | ND<0.10    | 121     | 133      | 61-146        | 6.49 | 20        |

(Cont.)



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.

**Date Prepared:** 02/24/2020

**Date Analyzed:** 02/25/2020

**Instrument:** GC23

**Matrix:** Soil

**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874

**BatchID:** 194497

**Extraction Method:** SW3550B

**Analytical Method:** SW8081A/8082

**Unit:** mg/kg

**Sample ID:** MB/LCS/LCSD-194497  
2002874-001AMS/MSD

### QC Summary Report for SW8081A/8082

| Analyte                   | MS<br>DF | MS<br>Result | MSD<br>Result | SPK<br>Val | SPKRef<br>Val | MS<br>%REC | MSD<br>%REC | MS/MSD<br>Limits | RPD     | RPD<br>Limit |
|---------------------------|----------|--------------|---------------|------------|---------------|------------|-------------|------------------|---------|--------------|
| p,p-DDD                   | 100      | 0.0368       | 0.0438        | 0.050      | ND<0.10       | 74         | 88          | 10-158           | 17.5    | 20           |
| p,p-DDE                   | 100      | 0.0404       | 0.0477        | 0.050      | ND<0.10       | 81         | 95          | 52-151           | 16.7    | 20           |
| p,p-DDT                   | 100      | 0.0534       | 0.0586        | 0.050      | ND<0.10       | 107        | 117         | 53-137           | 9.25    | 20           |
| Dieldrin                  | 100      | 0.0421       | 0.0494        | 0.050      | ND<0.10       | 84         | 99          | 58-163           | 15.9    | 20           |
| Endosulfan I              | 100      | 0.0431       | 0.0516        | 0.050      | ND<0.10       | 86         | 103         | 64-136           | 17.9    | 20           |
| Endosulfan II             | 100      | 0.0469       | 0.0542        | 0.050      | ND<0.10       | 94         | 108         | 46-141           | 14.4    | 20           |
| Endosulfan sulfate        | 100      | 0.0399       | 0.0490        | 0.050      | ND<0.10       | 80         | 98          | 45-144           | 20.4,F1 | 20           |
| Endrin                    | 100      | 0.0391       | 0.0453        | 0.050      | ND<0.10       | 78         | 91          | 56-153           | 14.7    | 20           |
| Endrin aldehyde           | 100      | 0.0429       | 0.0505        | 0.050      | ND<0.10       | 86         | 101         | 63-134           | 16.2    | 20           |
| Endrin ketone             | 100      | 0.0406       | 0.0478        | 0.050      | ND<0.10       | 81         | 96          | 53-130           | 16.4    | 20           |
| Heptachlor                | 100      | 0.0471       | 0.0539        | 0.050      | ND<0.10       | 94         | 108         | 55-147           | 13.5    | 20           |
| Heptachlor epoxide        | 100      | 0.0504       | 0.0534        | 0.050      | ND<0.10       | 101        | 107         | 63-128           | 5.80    | 20           |
| Hexachlorobenzene         | 100      | 0.0451       | 0.0516        | 0.050      | ND<1.0        | 90         | 103         | 71-132           | 13.5    | 20           |
| Hexachlorocyclopentadiene | 100      | 0.0392       | 0.0447        | 0.050      | ND<2.0        | 78         | 89          | 12-144           | 13.0    | 20           |
| Methoxychlor              | 100      | 0.0454       | 0.0525        | 0.050      | ND<0.10       | 91         | 105         | 70-150           | 14.5    | 20           |
| <b>Surrogate Recovery</b> |          |              |               |            |               |            |             |                  |         |              |
| Decachlorobiphenyl        | 100      | 0.0702       | 0.0842        | 0.050      |               | 140        | 168,F3      | 69-143           | 18.2    | 20           |



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC10, GC16, GC18  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194475  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194475  
2002874-001AMS/MSD

### QC Summary Report for SW8260B

| Analyte                       | MB Result | MDL     | RL      | SPK Val | MB SS %REC | MB SS Limits |
|-------------------------------|-----------|---------|---------|---------|------------|--------------|
| Acetone                       | ND        | 0.0390  | 0.100   | -       | -          | -            |
| tert-Amyl methyl ether (TAME) | ND        | 0.00100 | 0.00500 | -       | -          | -            |
| Benzene                       | ND        | 0.00160 | 0.00500 | -       | -          | -            |
| Bromobenzene                  | ND        | 0.00300 | 0.00500 | -       | -          | -            |
| Bromochloromethane            | ND        | 0.00150 | 0.00500 | -       | -          | -            |
| Bromodichloromethane          | ND        | 0.00120 | 0.00500 | -       | -          | -            |
| Bromoform                     | ND        | 0.00120 | 0.00500 | -       | -          | -            |
| Bromomethane                  | ND        | 0.00200 | 0.00500 | -       | -          | -            |
| 2-Butanone (MEK)              | ND        | 0.0210  | 0.0500  | -       | -          | -            |
| t-Butyl alcohol (TBA)         | ND        | 0.00530 | 0.0500  | -       | -          | -            |
| n-Butyl benzene               | ND        | 0.00350 | 0.00500 | -       | -          | -            |
| sec-Butyl benzene             | ND        | 0.00340 | 0.00500 | -       | -          | -            |
| tert-Butyl benzene            | ND        | 0.00290 | 0.00500 | -       | -          | -            |
| Carbon Disulfide              | ND        | 0.00360 | 0.00500 | -       | -          | -            |
| Carbon Tetrachloride          | ND        | 0.00170 | 0.00500 | -       | -          | -            |
| Chlorobenzene                 | ND        | 0.00180 | 0.00500 | -       | -          | -            |
| Chloroethane                  | ND        | 0.00160 | 0.00500 | -       | -          | -            |
| Chloroform                    | ND        | 0.00160 | 0.00500 | -       | -          | -            |
| Chloromethane                 | ND        | 0.00170 | 0.00500 | -       | -          | -            |
| 2-Chlorotoluene               | ND        | 0.00220 | 0.00500 | -       | -          | -            |
| 4-Chlorotoluene               | ND        | 0.00240 | 0.00500 | -       | -          | -            |
| Dibromochloromethane          | ND        | 0.00110 | 0.00500 | -       | -          | -            |
| 1,2-Dibromo-3-chloropropane   | ND        | 0.00370 | 0.00500 | -       | -          | -            |
| 1,2-Dibromoethane (EDB)       | ND        | 0.00130 | 0.00400 | -       | -          | -            |
| Dibromomethane                | ND        | 0.00140 | 0.00500 | -       | -          | -            |
| 1,2-Dichlorobenzene           | ND        | 0.00320 | 0.00500 | -       | -          | -            |
| 1,3-Dichlorobenzene           | ND        | 0.00180 | 0.00500 | -       | -          | -            |
| 1,4-Dichlorobenzene           | ND        | 0.00180 | 0.00500 | -       | -          | -            |
| Dichlorodifluoromethane       | ND        | 0.00110 | 0.00500 | -       | -          | -            |
| 1,1-Dichloroethane            | ND        | 0.00170 | 0.00500 | -       | -          | -            |
| 1,2-Dichloroethane (1,2-DCA)  | ND        | 0.00140 | 0.00400 | -       | -          | -            |
| 1,1-Dichloroethene            | ND        | 0.00170 | 0.00500 | -       | -          | -            |
| cis-1,2-Dichloroethene        | ND        | 0.00150 | 0.00500 | -       | -          | -            |
| trans-1,2-Dichloroethene      | ND        | 0.00160 | 0.00500 | -       | -          | -            |
| 1,2-Dichloropropane           | ND        | 0.00140 | 0.00500 | -       | -          | -            |
| 1,3-Dichloropropane           | ND        | 0.00160 | 0.00500 | -       | -          | -            |
| 2,2-Dichloropropane           | ND        | 0.00130 | 0.00500 | -       | -          | -            |
| 1,1-Dichloropropene           | ND        | 0.00180 | 0.00500 | -       | -          | -            |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC10, GC16, GC18  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194475  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194475  
2002874-001AMS/MSD

### QC Summary Report for SW8260B

| Analyte                       | MB Result | MDL      | RL      | SPK Val | MB SS %REC | MB SS Limits |
|-------------------------------|-----------|----------|---------|---------|------------|--------------|
| cis-1,3-Dichloropropene       | ND        | 0.00150  | 0.00500 | -       | -          | -            |
| trans-1,3-Dichloropropene     | ND        | 0.00140  | 0.00500 | -       | -          | -            |
| Diisopropyl ether (DIPE)      | ND        | 0.00140  | 0.00500 | -       | -          | -            |
| Ethylbenzene                  | ND        | 0.00250  | 0.00500 | -       | -          | -            |
| Ethyl tert-butyl ether (ETBE) | ND        | 0.00130  | 0.00500 | -       | -          | -            |
| Freon 113                     | ND        | 0.00160  | 0.00500 | -       | -          | -            |
| Hexachlorobutadiene           | ND        | 0.00500  | 0.00500 | -       | -          | -            |
| Hexachloroethane              | ND        | 0.00250  | 0.00500 | -       | -          | -            |
| 2-Hexanone                    | ND        | 0.00220  | 0.00500 | -       | -          | -            |
| Isopropylbenzene              | ND        | 0.00320  | 0.00500 | -       | -          | -            |
| 4-Isopropyl toluene           | ND        | 0.00320  | 0.00500 | -       | -          | -            |
| Methyl-t-butyl ether (MTBE)   | ND        | 0.00130  | 0.00500 | -       | -          | -            |
| Methylene chloride            | ND        | 0.0100   | 0.0200  | -       | -          | -            |
| 4-Methyl-2-pentanone (MIBK)   | ND        | 0.000800 | 0.00500 | -       | -          | -            |
| Naphthalene                   | ND        | 0.00440  | 0.00500 | -       | -          | -            |
| n-Propyl benzene              | ND        | 0.00290  | 0.00500 | -       | -          | -            |
| Styrene                       | ND        | 0.00300  | 0.00500 | -       | -          | -            |
| 1,1,1,2-Tetrachloroethane     | ND        | 0.00160  | 0.00500 | -       | -          | -            |
| 1,1,2,2-Tetrachloroethane     | ND        | 0.00130  | 0.00500 | -       | -          | -            |
| Tetrachloroethene             | ND        | 0.00230  | 0.00500 | -       | -          | -            |
| Toluene                       | ND        | 0.00240  | 0.00500 | -       | -          | -            |
| 1,2,3-Trichlorobenzene        | ND        | 0.00300  | 0.00500 | -       | -          | -            |
| 1,2,4-Trichlorobenzene        | ND        | 0.00290  | 0.00500 | -       | -          | -            |
| 1,1,1-Trichloroethane         | ND        | 0.00180  | 0.00500 | -       | -          | -            |
| 1,1,2-Trichloroethane         | ND        | 0.00190  | 0.00500 | -       | -          | -            |
| Trichloroethene               | ND        | 0.00170  | 0.00500 | -       | -          | -            |
| Trichlorofluoromethane        | ND        | 0.00160  | 0.00500 | -       | -          | -            |
| 1,2,3-Trichloropropane        | ND        | 0.00190  | 0.00500 | -       | -          | -            |
| 1,2,4-Trimethylbenzene        | ND        | 0.00280  | 0.00500 | -       | -          | -            |
| 1,3,5-Trimethylbenzene        | ND        | 0.00260  | 0.00500 | -       | -          | -            |
| Vinyl Chloride                | ND        | 0.00150  | 0.00500 | -       | -          | -            |
| m,p-Xylene                    | ND        | 0.00400  | 0.00500 | -       | -          | -            |
| o-Xylene                      | ND        | 0.00180  | 0.00500 | -       | -          | -            |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC10, GC16, GC18  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194475  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194475  
2002874-001AMS/MSD

### QC Summary Report for SW8260B

| Analyte                   | MB<br>Result | MDL | RL | SPK<br>Val | MB SS<br>%REC | MB SS<br>Limits |
|---------------------------|--------------|-----|----|------------|---------------|-----------------|
| <b>Surrogate Recovery</b> |              |     |    |            |               |                 |
| Dibromofluoromethane      | 0.110        |     |    | 0.125      | 88            | 66-112          |
| Toluene-d8                | 0.130        |     |    | 0.125      | 104           | 92-109          |
| 4-BFB                     | 0.0100       |     |    | 0.0125     | 80            | 72-112          |
| Benzene-d6                | 0.0860       |     |    | 0.1        | 86            | 81-126          |
| Ethylbenzene-d10          | 0.104        |     |    | 0.1        | 103           | 92-138          |
| 1,2-DCB-d4                | 0.0784       |     |    | 0.1        | 78            | 68-108          |



## Quality Control Report

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**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194475  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194475  
2002874-001AMS/MSD

### QC Summary Report for SW8260B

| Analyte                       | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD  | RPD Limit |
|-------------------------------|------------|-------------|---------|----------|-----------|-----------------|------|-----------|
| Acetone                       | 0.256      | 0.265       | 0.20    | 128,F2   | 133,F2    | 59-127          | 3.78 | 20        |
| tert-Amyl methyl ether (TAME) | 0.0181     | 0.0188      | 0.020   | 91       | 94        | 54-98           | 3.53 | 20        |
| Benzene                       | 0.0201     | 0.0210      | 0.020   | 100      | 105       | 71-115          | 4.49 | 20        |
| Bromobenzene                  | 0.0176     | 0.0181      | 0.020   | 88       | 90        | 69-120          | 2.56 | 20        |
| Bromochloromethane            | 0.0200     | 0.0206      | 0.020   | 100      | 103       | 63-117          | 2.85 | 20        |
| Bromodichloromethane          | 0.0192     | 0.0201      | 0.020   | 96       | 100       | 61-109          | 4.24 | 20        |
| Bromoform                     | 0.0144     | 0.0149      | 0.020   | 72       | 74        | 46-87           | 3.47 | 20        |
| Bromomethane                  | 0.0171     | 0.0178      | 0.020   | 85       | 89        | 22-195          | 4.05 | 20        |
| 2-Butanone (MEK)              | 0.0810     | 0.0888      | 0.080   | 101      | 111       | 53-124          | 9.21 | 20        |
| t-Butyl alcohol (TBA)         | 0.0846     | 0.0887      | 0.080   | 106      | 111       | 29-142          | 4.74 | 20        |
| n-Butyl benzene               | 0.0266     | 0.0271      | 0.020   | 133      | 135       | 102-169         | 1.97 | 20        |
| sec-Butyl benzene             | 0.0262     | 0.0270      | 0.020   | 131      | 135       | 100-166         | 3.25 | 20        |
| tert-Butyl benzene            | 0.0232     | 0.0236      | 0.020   | 116      | 118       | 91-153          | 1.89 | 20        |
| Carbon Disulfide              | 0.0194     | 0.0201      | 0.020   | 97       | 100       | 60-125          | 3.40 | 20        |
| Carbon Tetrachloride          | 0.0198     | 0.0208      | 0.020   | 99       | 104       | 69-124          | 4.76 | 20        |
| Chlorobenzene                 | 0.0185     | 0.0191      | 0.020   | 93       | 96        | 73-116          | 3.06 | 20        |
| Chloroethane                  | 0.0181     | 0.0186      | 0.020   | 91       | 93        | 47-140          | 2.58 | 20        |
| Chloroform                    | 0.0205     | 0.0215      | 0.020   | 103      | 108       | 69-118          | 4.59 | 20        |
| Chloromethane                 | 0.0142     | 0.0145      | 0.020   | 71       | 73        | 30-132          | 2.07 | 20        |
| 2-Chlorotoluene               | 0.0205     | 0.0211      | 0.020   | 102      | 105       | 75-147          | 2.88 | 20        |
| 4-Chlorotoluene               | 0.0202     | 0.0208      | 0.020   | 101      | 104       | 75-137          | 2.71 | 20        |
| Dibromochloromethane          | 0.0180     | 0.0188      | 0.020   | 90       | 94        | 57-105          | 4.55 | 20        |
| 1,2-Dibromo-3-chloropropane   | 0.00853    | 0.00897     | 0.010   | 85       | 90        | 36-103          | 5.10 | 20        |
| 1,2-Dibromoethane (EDB)       | 0.00933    | 0.00986     | 0.010   | 93       | 99        | 66-101          | 5.56 | 20        |
| Dibromomethane                | 0.0183     | 0.0193      | 0.020   | 92       | 96        | 61-103          | 4.97 | 20        |
| 1,2-Dichlorobenzene           | 0.0162     | 0.0168      | 0.020   | 81       | 84        | 59-104          | 3.88 | 20        |
| 1,3-Dichlorobenzene           | 0.0187     | 0.0194      | 0.020   | 93       | 97        | 70-133          | 3.69 | 20        |
| 1,4-Dichlorobenzene           | 0.0191     | 0.0196      | 0.020   | 96       | 98        | 68-123          | 2.62 | 20        |
| Dichlorodifluoromethane       | 0.00452    | 0.00478     | 0.020   | 23       | 24        | 13-107          | 5.70 | 20        |
| 1,1-Dichloroethane            | 0.0208     | 0.0216      | 0.020   | 104      | 108       | 69-118          | 4.06 | 20        |
| 1,2-Dichloroethane (1,2-DCA)  | 0.0204     | 0.0213      | 0.020   | 102      | 106       | 59-112          | 4.56 | 20        |
| 1,1-Dichloroethene            | 0.0196     | 0.0206      | 0.020   | 98       | 103       | 69-126          | 4.63 | 20        |
| cis-1,2-Dichloroethene        | 0.0198     | 0.0206      | 0.020   | 99       | 103       | 69-116          | 4.31 | 20        |
| trans-1,2-Dichloroethene      | 0.0200     | 0.0208      | 0.020   | 100      | 104       | 73-116          | 4.24 | 20        |
| 1,2-Dichloropropane           | 0.0189     | 0.0198      | 0.020   | 94       | 99        | 65-111          | 4.70 | 20        |
| 1,3-Dichloropropane           | 0.0196     | 0.0201      | 0.020   | 98       | 100       | 67-110          | 2.08 | 20        |
| 2,2-Dichloropropane           | 0.0225     | 0.0233      | 0.020   | 112      | 116       | 65-125          | 3.37 | 20        |
| 1,1-Dichloropropene           | 0.0204     | 0.0213      | 0.020   | 102      | 107       | 70-123          | 4.19 | 20        |

(Cont.)



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC10, GC16, GC18  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194475  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194475  
2002874-001AMS/MSD

### QC Summary Report for SW8260B

| Analyte                       | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD   | RPD Limit |
|-------------------------------|------------|-------------|---------|----------|-----------|-----------------|-------|-----------|
| cis-1,3-Dichloropropene       | 0.0215     | 0.0224      | 0.020   | 107      | 112       | 68-126          | 4.48  | 20        |
| trans-1,3-Dichloropropene     | 0.0204     | 0.0214      | 0.020   | 102      | 107       | 69-117          | 4.75  | 20        |
| Diisopropyl ether (DIPE)      | 0.0194     | 0.0202      | 0.020   | 97       | 101       | 57-110          | 4.11  | 20        |
| Ethylbenzene                  | 0.0203     | 0.0210      | 0.020   | 101      | 105       | 80-128          | 3.33  | 20        |
| Ethyl tert-butyl ether (ETBE) | 0.0194     | 0.0202      | 0.020   | 97       | 101       | 54-106          | 4.04  | 20        |
| Freon 113                     | 0.0169     | 0.0178      | 0.020   | 85       | 89        | 60-108          | 5.35  | 20        |
| Hexachlorobutadiene           | 0.0263     | 0.0271      | 0.020   | 132      | 136       | 67-182          | 3.09  | 20        |
| Hexachloroethane              | 0.0213     | 0.0220      | 0.020   | 107      | 110       | 85-156          | 3.23  | 20        |
| 2-Hexanone                    | 0.0160     | 0.0166      | 0.020   | 80       | 83        | 37-90           | 3.80  | 20        |
| Isopropylbenzene              | 0.0234     | 0.0241      | 0.020   | 117      | 121       | 64-167          | 3.00  | 20        |
| 4-Isopropyl toluene           | 0.0243     | 0.0251      | 0.020   | 121      | 125       | 88-167          | 3.20  | 20        |
| Methyl-t-butyl ether (MTBE)   | 0.0195     | 0.0203      | 0.020   | 97       | 101       | 60-102          | 4.22  | 20        |
| Methylene chloride            | 0.0207     | 0.0214      | 0.020   | 104      | 107       | 71-117          | 3.35  | 20        |
| 4-Methyl-2-pentanone (MIBK)   | 0.0165     | 0.0170      | 0.020   | 83       | 85        | 48-90           | 2.59  | 20        |
| Naphthalene                   | 0.0112     | 0.0114      | 0.020   | 56       | 57        | 29-65           | 1.10  | 20        |
| n-Propyl benzene              | 0.0240     | 0.0244      | 0.020   | 120      | 122       | 88-161          | 1.84  | 20        |
| Styrene                       | 0.0164     | 0.0169      | 0.020   | 82       | 85        | 70-108          | 3.01  | 20        |
| 1,1,1,2-Tetrachloroethane     | 0.0190     | 0.0197      | 0.020   | 95       | 98        | 69-117          | 3.42  | 20        |
| 1,1,2,2-Tetrachloroethane     | 0.0182     | 0.0185      | 0.020   | 91       | 92        | 53-96           | 1.54  | 20        |
| Tetrachloroethene             | 0.0216     | 0.0224      | 0.020   | 108      | 112       | 78-128          | 3.76  | 20        |
| Toluene                       | 0.0198     | 0.0204      | 0.020   | 99       | 102       | 78-121          | 2.83  | 20        |
| 1,2,3-Trichlorobenzene        | 0.0115     | 0.0115      | 0.020   | 57       | 58        | 35-80           | 0.427 | 20        |
| 1,2,4-Trichlorobenzene        | 0.0149     | 0.0155      | 0.020   | 75       | 77        | 46-101          | 3.78  | 20        |
| 1,1,1-Trichloroethane         | 0.0201     | 0.0212      | 0.020   | 100      | 106       | 69-121          | 5.59  | 20        |
| 1,1,2-Trichloroethane         | 0.0197     | 0.0205      | 0.020   | 98       | 103       | 64-104          | 4.27  | 20        |
| Trichloroethene               | 0.0202     | 0.0214      | 0.020   | 101      | 107       | 73-118          | 5.83  | 20        |
| Trichlorofluoromethane        | 0.0178     | 0.0185      | 0.020   | 89       | 93        | 31-119          | 4.09  | 20        |
| 1,2,3-Trichloropropane        | 0.00982    | 0.00995     | 0.010   | 98       | 100       | 65-107          | 1.33  | 20        |
| 1,2,4-Trimethylbenzene        | 0.0212     | 0.0217      | 0.020   | 106      | 108       | 80-147          | 2.05  | 20        |
| 1,3,5-Trimethylbenzene        | 0.0228     | 0.0232      | 0.020   | 114      | 116       | 83-156          | 1.71  | 20        |
| Vinyl Chloride                | 0.00765    | 0.00793     | 0.010   | 77       | 79        | 40-125          | 3.56  | 20        |
| m,p-Xylene                    | 0.0385     | 0.0400      | 0.040   | 96       | 100       | 80-122          | 3.79  | 20        |
| o-Xylene                      | 0.0182     | 0.0190      | 0.020   | 91       | 95        | 79-116          | 4.29  | 20        |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC10, GC16, GC18  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194475  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194475  
2002874-001AMS/MSD

### QC Summary Report for SW8260B

| Analyte                   | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD  | RPD Limit |
|---------------------------|------------|-------------|---------|----------|-----------|-----------------|------|-----------|
| <b>Surrogate Recovery</b> |            |             |         |          |           |                 |      |           |
| Dibromofluoromethane      | 0.116      | 0.118       | 0.12    | 92       | 95        | 66-112          | 2.50 | 20        |
| Toluene-d8                | 0.133      | 0.135       | 0.12    | 106      | 108       | 92-109          | 1.58 | 20        |
| 4-BFB                     | 0.0136     | 0.0132      | 0.012   | 109      | 105       | 72-112          | 3.10 | 20        |
| Benzene-d6                | 0.112      | 0.115       | 0.10    | 112      | 115       | 81-126          | 2.84 | 20        |
| Ethylbenzene-d10          | 0.132      | 0.137       | 0.10    | 132      | 137       | 92-138          | 3.15 | 20        |
| 1,2-DCB-d4                | 0.0840     | 0.0856      | 0.10    | 84       | 86        | 68-108          | 1.87 | 20        |

| Analyte                       | MS DF | MS Result | MSD Result | SPK Val | SPKRef Val | MS %REC | MSD %REC | MS/MSD Limits | RPD   | RPD Limit |
|-------------------------------|-------|-----------|------------|---------|------------|---------|----------|---------------|-------|-----------|
| Acetone                       | 1     | 0.164     | 0.164      | 0.20    | ND         | 82      | 82       | 48-114        | 0.120 | 20        |
| tert-Amyl methyl ether (TAME) | 1     | 0.0122    | 0.0129     | 0.020   | ND         | 61      | 64       | 44-94         | 5.65  | 20        |
| Benzene                       | 1     | 0.0137    | 0.0146     | 0.020   | ND         | 68      | 73       | 50-115        | 6.32  | 20        |
| Bromobenzene                  | 1     | 0.0135    | 0.0141     | 0.020   | ND         | 67      | 70       | 60-114        | 4.07  | 20        |
| Bromochloromethane            | 1     | 0.0130    | 0.0138     | 0.020   | ND         | 65      | 69       | 50-113        | 6.03  | 20        |
| Bromodichloromethane          | 1     | 0.0123    | 0.0130     | 0.020   | ND         | 62      | 65       | 46-109        | 5.49  | 20        |
| Bromoform                     | 1     | 0.00923   | 0.00941    | 0.020   | ND         | 46      | 47       | 38-83         | 1.99  | 20        |
| Bromomethane                  | 1     | 0.0192    | 0.0210     | 0.020   | ND         | 96      | 105      | 10-149        | 9.09  | 20        |
| 2-Butanone (MEK)              | 1     | 0.0499    | 0.0507     | 0.080   | ND         | 62      | 63       | 46-111        | 1.58  | 20        |
| t-Butyl alcohol (TBA)         | 1     | 0.0494    | 0.0529     | 0.080   | ND         | 62      | 66       | 32-112        | 6.91  | 20        |
| n-Butyl benzene               | 1     | 0.0196    | 0.0202     | 0.020   | ND         | 98      | 101      | 71-156        | 2.71  | 20        |
| sec-Butyl benzene             | 1     | 0.0185    | 0.0193     | 0.020   | ND         | 92      | 97       | 28-190        | 4.69  | 20        |
| tert-Butyl benzene            | 1     | 0.0171    | 0.0180     | 0.020   | ND         | 86      | 90       | 69-145        | 5.13  | 20        |
| Carbon Disulfide              | 1     | 0.0115    | 0.0122     | 0.020   | ND         | 58      | 61       | 19-135        | 5.20  | 20        |
| Carbon Tetrachloride          | 1     | 0.0121    | 0.0126     | 0.020   | ND         | 60      | 63       | 51-120        | 4.60  | 20        |
| Chlorobenzene                 | 1     | 0.0147    | 0.0156     | 0.020   | ND         | 73      | 78       | 63-108        | 5.67  | 20        |
| Chloroethane                  | 1     | 0.0143    | 0.0151     | 0.020   | ND         | 71      | 76       | 40-122        | 5.64  | 20        |
| Chloroform                    | 1     | 0.0138    | 0.0145     | 0.020   | ND         | 69      | 73       | 55-114        | 5.23  | 20        |
| Chloromethane                 | 1     | 0.00621   | 0.00670    | 0.020   | ND         | 31      | 33       | 14-128        | 7.58  | 20        |
| 2-Chlorotoluene               | 1     | 0.0162    | 0.0170     | 0.020   | ND         | 81      | 85       | 45-153        | 4.59  | 20        |
| 4-Chlorotoluene               | 1     | 0.0164    | 0.0171     | 0.020   | ND         | 82      | 86       | 65-126        | 4.34  | 20        |
| Dibromochloromethane          | 1     | 0.0116    | 0.0123     | 0.020   | ND         | 58      | 61       | 48-97         | 5.61  | 20        |
| 1,2-Dibromo-3-chloropropane   | 1     | 0.00471   | 0.00561    | 0.010   | ND         | 47      | 56       | 32-95         | 17.5  | 20        |
| 1,2-Dibromoethane (EDB)       | 1     | 0.00651   | 0.00679    | 0.010   | ND         | 65      | 68       | 52-99         | 4.20  | 20        |
| Dibromomethane                | 1     | 0.0120    | 0.0129     | 0.020   | ND         | 60      | 64       | 50-100        | 7.07  | 20        |
| 1,2-Dichlorobenzene           | 1     | 0.0124    | 0.0131     | 0.020   | ND         | 62      | 65       | 38-116        | 5.79  | 20        |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC10, GC16, GC18  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194475  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194475  
2002874-001AMS/MSD

### QC Summary Report for SW8260B

| Analyte                       | MS<br>DF | MS<br>Result | MSD<br>Result | SPK<br>Val | SPKRef<br>Val | MS<br>%REC | MSD<br>%REC | MS/MSD<br>Limits | RPD  | RPD<br>Limit |
|-------------------------------|----------|--------------|---------------|------------|---------------|------------|-------------|------------------|------|--------------|
| 1,3-Dichlorobenzene           | 1        | 0.0149       | 0.0156        | 0.020      | ND            | 74         | 78          | 58-127           | 4.67 | 20           |
| 1,4-Dichlorobenzene           | 1        | 0.0142       | 0.0151        | 0.020      | ND            | 71         | 75          | 54-123           | 5.78 | 20           |
| Dichlorodifluoromethane       | 1        | 0.00288      | 0.00317       | 0.020      | ND            | 14         | 16          | 8-93             | 9.67 | 20           |
| 1,1-Dichloroethane            | 1        | 0.0140       | 0.0148        | 0.020      | ND            | 70         | 74          | 53-115           | 5.93 | 20           |
| 1,2-Dichloroethane (1,2-DCA)  | 1        | 0.0135       | 0.0145        | 0.020      | ND            | 68         | 73          | 48-105           | 7.21 | 20           |
| 1,1-Dichloroethene            | 1        | 0.0126       | 0.0133        | 0.020      | ND            | 63         | 66          | 47-127           | 5.07 | 20           |
| cis-1,2-Dichloroethene        | 1        | 0.0135       | 0.0142        | 0.020      | ND            | 67         | 71          | 56-111           | 5.40 | 20           |
| trans-1,2-Dichloroethene      | 1        | 0.0131       | 0.0138        | 0.020      | ND            | 66         | 69          | 51-115           | 5.19 | 20           |
| 1,2-Dichloropropane           | 1        | 0.0135       | 0.0144        | 0.020      | ND            | 68         | 72          | 51-111           | 6.55 | 20           |
| 1,3-Dichloropropane           | 1        | 0.0141       | 0.0146        | 0.020      | ND            | 70         | 73          | 51-109           | 3.59 | 20           |
| 2,2-Dichloropropane           | 1        | 0.0136       | 0.0144        | 0.020      | ND            | 68         | 72          | 50-116           | 6.22 | 20           |
| 1,1-Dichloropropene           | 1        | 0.0133       | 0.0139        | 0.020      | ND            | 66         | 69          | 46-124           | 4.73 | 20           |
| cis-1,3-Dichloropropene       | 1        | 0.0136       | 0.0143        | 0.020      | ND            | 68         | 72          | 41-127           | 4.85 | 20           |
| trans-1,3-Dichloropropene     | 1        | 0.0135       | 0.0142        | 0.020      | ND            | 68         | 71          | 50-111           | 4.99 | 20           |
| Diisopropyl ether (DIPE)      | 1        | 0.0131       | 0.0138        | 0.020      | ND            | 66         | 69          | 50-103           | 5.09 | 20           |
| Ethylbenzene                  | 1        | 0.0154       | 0.0162        | 0.020      | ND            | 77         | 81          | 65-119           | 4.89 | 20           |
| Ethyl tert-butyl ether (ETBE) | 1        | 0.0135       | 0.0142        | 0.020      | ND            | 68         | 71          | 47-100           | 4.61 | 20           |
| Freon 113                     | 1        | 0.0113       | 0.0118        | 0.020      | ND            | 56         | 59          | 48-98            | 4.69 | 20           |
| Hexachlorobutadiene           | 1        | 0.0132       | 0.0146        | 0.020      | ND            | 66         | 73          | 36-166           | 10.3 | 20           |
| Hexachloroethane              | 1        | 0.0163       | 0.0173        | 0.020      | ND            | 81         | 86          | 61-146           | 6.07 | 20           |
| 2-Hexanone                    | 1        | 0.0117       | 0.0128        | 0.020      | ND            | 58         | 64          | 31-87            | 9.73 | 20           |
| Isopropylbenzene              | 1        | 0.0158       | 0.0166        | 0.020      | ND            | 79         | 83          | 24-171           | 4.62 | 20           |
| 4-Isopropyl toluene           | 1        | 0.0181       | 0.0189        | 0.020      | ND            | 91         | 95          | 69-150           | 4.25 | 20           |
| Methyl-t-butyl ether (MTBE)   | 1        | 0.0129       | 0.0135        | 0.020      | ND            | 65         | 68          | 50-95            | 4.36 | 20           |
| Methylene chloride            | 1        | 0.0134       | 0.0142        | 0.020      | ND            | 67         | 71          | 39-123           | 6.34 | 20           |
| 4-Methyl-2-pentanone (MIBK)   | 1        | 0.0113       | 0.0119        | 0.020      | ND            | 56         | 59          | 41-83            | 5.43 | 20           |
| Naphthalene                   | 1        | 0.00940      | 0.0101        | 0.020      | ND            | 47         | 50          | 13-77            | 6.89 | 20           |
| n-Propyl benzene              | 1        | 0.0171       | 0.0177        | 0.020      | ND            | 85         | 88          | 26-184           | 3.44 | 20           |
| Styrene                       | 1        | 0.0130       | 0.0139        | 0.020      | ND            | 65         | 69          | 54-105           | 6.67 | 20           |
| 1,1,1,2-Tetrachloroethane     | 1        | 0.0138       | 0.0144        | 0.020      | ND            | 69         | 72          | 60-108           | 4.27 | 20           |
| 1,1,2,2-Tetrachloroethane     | 1        | 0.0128       | 0.0137        | 0.020      | ND            | 64         | 69          | 37-108           | 7.18 | 20           |
| Tetrachloroethene             | 1        | 0.0138       | 0.0144        | 0.020      | ND            | 69         | 72          | 54-127           | 4.51 | 20           |
| Toluene                       | 1        | 0.0158       | 0.0165        | 0.020      | ND            | 79         | 82          | 63-114           | 4.48 | 20           |
| 1,2,3-Trichlorobenzene        | 1        | 0.00912      | 0.00966       | 0.020      | ND            | 46         | 48          | 14-97            | 5.72 | 20           |
| 1,2,4-Trichlorobenzene        | 1        | 0.0107       | 0.0111        | 0.020      | ND            | 53         | 55          | 31-106           | 3.64 | 20           |
| 1,1,1-Trichloroethane         | 1        | 0.0126       | 0.0134        | 0.020      | ND            | 63         | 67          | 55-114           | 6.13 | 20           |
| 1,1,2-Trichloroethane         | 1        | 0.0134       | 0.0140        | 0.020      | ND            | 67         | 70          | 50-104           | 3.90 | 20           |
| Trichloroethene               | 1        | 0.0128       | 0.0135        | 0.020      | ND            | 64         | 68          | 47-127           | 5.58 | 20           |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC10, GC16, GC18  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194475  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194475  
2002874-001AMS/MSD

### QC Summary Report for SW8260B

| Analyte                   | MS<br>DF | MS<br>Result | MSD<br>Result | SPK<br>Val | SPKRef<br>Val | MS<br>%REC | MSD<br>%REC | MS/MSD<br>Limits | RPD    | RPD<br>Limit |
|---------------------------|----------|--------------|---------------|------------|---------------|------------|-------------|------------------|--------|--------------|
| Trichlorofluoromethane    | 1        | 0.0112       | 0.0118        | 0.020      | ND            | 56         | 59          | 9-119            | 5.74   | 20           |
| 1,2,3-Trichloropropane    | 1        | 0.00636      | 0.00707       | 0.010      | ND            | 64         | 71          | 45-115           | 10.5   | 20           |
| 1,2,4-Trimethylbenzene    | 1        | 0.0174       | 0.0182        | 0.020      | ND            | 87         | 91          | 69-133           | 4.75   | 20           |
| 1,3,5-Trimethylbenzene    | 1        | 0.0181       | 0.0188        | 0.020      | ND            | 90         | 94          | 27-172           | 3.84   | 20           |
| Vinyl Chloride            | 1        | 0.00568      | 0.00605       | 0.010      | ND            | 57         | 61          | 33-114           | 6.26   | 20           |
| m,p-Xylene                | 1        | 0.0299       | 0.0316        | 0.040      | ND            | 75         | 79          | 62-117           | 5.64   | 20           |
| o-Xylene                  | 1        | 0.0147       | 0.0155        | 0.020      | ND            | 73         | 78          | 19-144           | 5.55   | 20           |
| <b>Surrogate Recovery</b> |          |              |               |            |               |            |             |                  |        |              |
| Dibromofluoromethane      | 1        | 0.111        | 0.111         | 0.12       |               | 89         | 89          | 66-116           | 0.357  | 20           |
| Toluene-d8                | 1        | 0.135        | 0.136         | 0.12       |               | 108        | 108         | 86-110           | 0.207  | 20           |
| 4-BFB                     | 1        | 0.0107       | 0.0106        | 0.012      |               | 85         | 85          | 71-114           | 0.383  | 20           |
| Benzene-d6                | 1        | 0.0752       | 0.0765        | 0.10       |               | 75         | 77          | 62-122           | 1.79   | 20           |
| Ethylbenzene-d10          | 1        | 0.0928       | 0.0937        | 0.10       |               | 93         | 94          | 69-130           | 0.986  | 20           |
| 1,2-DCB-d4                | 1        | 0.0732       | 0.0732        | 0.10       |               | 73         | 73          | 55-108           | 0.0402 | 20           |



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/25/2020  
**Date Analyzed:** 02/26/2020  
**Instrument:** GC21  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194583  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194583  
2002874-003AMS/MSD

### QC Summary Report for SW8270C

| Analyte                         | MB Result | MDL      | RL      | SPK Val | MB SS %REC | MB SS Limits |
|---------------------------------|-----------|----------|---------|---------|------------|--------------|
| 1,1-Biphenyl                    | ND        | 0.00230  | 0.0130  | -       | -          | -            |
| 1,2,4-Trichlorobenzene          | ND        | 0.150    | 0.250   | -       | -          | -            |
| 1,2-Dichlorobenzene             | ND        | 0.150    | 0.250   | -       | -          | -            |
| 1,2-Diphenylhydrazine           | ND        | 0.150    | 0.250   | -       | -          | -            |
| 1,3-Dichlorobenzene             | ND        | 0.130    | 0.250   | -       | -          | -            |
| 1,4-Dichlorobenzene             | ND        | 0.180    | 0.250   | -       | -          | -            |
| 1-Methylnaphthalene             | ND        | 0.00110  | 0.00130 | -       | -          | -            |
| 2,4,5-Trichlorophenol           | ND        | 0.00130  | 0.00250 | -       | -          | -            |
| 2,4,6-Trichlorophenol           | ND        | 0.00120  | 0.0130  | -       | -          | -            |
| 2,4-Dichlorophenol              | ND        | 0.00170  | 0.0130  | -       | -          | -            |
| 2,4-Dimethylphenol              | ND        | 0.160    | 0.250   | -       | -          | -            |
| 2,4-Dinitrophenol               | ND        | 0.0510   | 0.130   | -       | -          | -            |
| 2,4-Dinitrotoluene              | ND        | 0.00110  | 0.00630 | -       | -          | -            |
| 2,6-Dinitrotoluene              | ND        | 0.00130  | 0.00250 | -       | -          | -            |
| 2-Chloronaphthalene             | ND        | 0.140    | 0.250   | -       | -          | -            |
| 2-Chlorophenol                  | ND        | 0.00200  | 0.00500 | -       | -          | -            |
| 2-Methylnaphthalene             | ND        | 0.00170  | 0.00250 | -       | -          | -            |
| 2-Methylphenol (o-Cresol)       | ND        | 0.270    | 0.500   | -       | -          | -            |
| 2-Nitroaniline                  | ND        | 0.690    | 1.20    | -       | -          | -            |
| 2-Nitrophenol                   | ND        | 0.660    | 1.20    | -       | -          | -            |
| 3 & 4-Methylphenol (m,p-Cresol) | ND        | 0.240    | 0.250   | -       | -          | -            |
| 3,3-Dichlorobenzidine           | ND        | 0.00160  | 0.00250 | -       | -          | -            |
| 3-Nitroaniline                  | ND        | 0.840    | 1.20    | -       | -          | -            |
| 4,6-Dinitro-2-methylphenol      | ND        | 0.810    | 1.20    | -       | -          | -            |
| 4-Bromophenyl Phenyl Ether      | ND        | 0.150    | 0.250   | -       | -          | -            |
| 4-Chloro-3-methylphenol         | ND        | 0.200    | 0.250   | -       | -          | -            |
| 4-Chloroaniline                 | ND        | 0.00160  | 0.00250 | -       | -          | -            |
| 4-Chlorophenyl Phenyl Ether     | ND        | 0.160    | 0.250   | -       | -          | -            |
| 4-Nitroaniline                  | ND        | 1.10     | 1.20    | -       | -          | -            |
| 4-Nitrophenol                   | ND        | 0.770    | 1.20    | -       | -          | -            |
| Acenaphthene                    | ND        | 0.000770 | 0.00130 | -       | -          | -            |
| Acenaphthylene                  | ND        | 0.000410 | 0.00130 | -       | -          | -            |
| Acetochlor                      | ND        | 0.250    | 0.250   | -       | -          | -            |
| Anthracene                      | ND        | 0.000820 | 0.00130 | -       | -          | -            |
| Benzidine                       | ND        | 0.670    | 1.20    | -       | -          | -            |
| Benzo (a) anthracene            | ND        | 0.00430  | 0.00500 | -       | -          | -            |
| Benzo (a) pyrene                | ND        | 0.00120  | 0.00250 | -       | -          | -            |
| Benzo (b) fluoranthene          | ND        | 0.00160  | 0.00630 | -       | -          | -            |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/25/2020  
**Date Analyzed:** 02/26/2020  
**Instrument:** GC21  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194583  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194583  
2002874-003AMS/MSD

### QC Summary Report for SW8270C

| Analyte                       | MB Result | MDL      | RL      | SPK Val | MB SS %REC | MB SS Limits |
|-------------------------------|-----------|----------|---------|---------|------------|--------------|
| Benzo (g,h,i) perylene        | ND        | 0.00110  | 0.00250 | -       | -          | -            |
| Benzo (k) fluoranthene        | ND        | 0.000790 | 0.00130 | -       | -          | -            |
| Benzyl Alcohol                | ND        | 0.760    | 1.20    | -       | -          | -            |
| Bis (2-chloroethoxy) Methane  | ND        | 0.150    | 0.250   | -       | -          | -            |
| Bis (2-chloroethyl) Ether     | ND        | 0.00160  | 0.00250 | -       | -          | -            |
| Bis (2-chloroisopropyl) Ether | ND        | 0.00140  | 0.00250 | -       | -          | -            |
| Bis (2-ethylhexyl) Adipate    | ND        | 0.150    | 0.500   | -       | -          | -            |
| Bis (2-ethylhexyl) Phthalate  | ND        | 0.00340  | 0.00500 | -       | -          | -            |
| Butylbenzyl Phthalate         | ND        | 0.0210   | 0.0250  | -       | -          | -            |
| Chrysene                      | 0.00114,J | 0.000800 | 0.00250 | -       | -          | -            |
| Dibenzo (a,h) anthracene      | ND        | 0.00150  | 0.00250 | -       | -          | -            |
| Dibenzofuran                  | ND        | 0.160    | 0.250   | -       | -          | -            |
| Diethyl Phthalate             | ND        | 0.00360  | 0.00500 | -       | -          | -            |
| Dimethyl Phthalate            | ND        | 0.00250  | 0.00250 | -       | -          | -            |
| Di-n-butyl Phthalate          | 0.00259,J | 0.00250  | 0.00500 | -       | -          | -            |
| Di-n-octyl Phthalate          | ND        | 0.00430  | 0.00500 | -       | -          | -            |
| Fluoranthene                  | 0.00112,J | 0.00110  | 0.00130 | -       | -          | -            |
| Fluorene                      | ND        | 0.000860 | 0.00250 | -       | -          | -            |
| Hexachlorobenzene             | ND        | 0.000570 | 0.00130 | -       | -          | -            |
| Hexachlorobutadiene           | ND        | 0.000420 | 0.00250 | -       | -          | -            |
| Hexachlorocyclopentadiene     | ND        | 0.110    | 2.00    | -       | -          | -            |
| Hexachloroethane              | ND        | 0.00110  | 0.00250 | -       | -          | -            |
| Indeno (1,2,3-cd) pyrene      | 0.00177,J | 0.00100  | 0.00250 | -       | -          | -            |
| Isophorone                    | ND        | 0.150    | 0.250   | -       | -          | -            |
| Naphthalene                   | ND        | 0.000690 | 0.00130 | -       | -          | -            |
| Nitrobenzene                  | ND        | 0.160    | 0.250   | -       | -          | -            |
| N-Nitrosodimethylamine        | ND        | 0.650    | 1.20    | -       | -          | -            |
| N-Nitrosodi-n-propylamine     | ND        | 0.140    | 0.250   | -       | -          | -            |
| N-Nitrosodiphenylamine        | ND        | 0.150    | 0.250   | -       | -          | -            |
| Pentachlorophenol             | ND        | 0.0140   | 0.0310  | -       | -          | -            |
| Phenanthrene                  | ND        | 0.000670 | 0.00500 | -       | -          | -            |
| Phenol                        | ND        | 0.000940 | 0.00500 | -       | -          | -            |
| Pyrene                        | ND        | 0.00140  | 0.00250 | -       | -          | -            |
| Pyridine                      | ND        | 0.180    | 0.250   | -       | -          | -            |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/25/2020  
**Date Analyzed:** 02/26/2020  
**Instrument:** GC21  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194583  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194583  
2002874-003AMS/MSD

### QC Summary Report for SW8270C

| Analyte                   | MB<br>Result | MDL | RL | SPK<br>Val | MB SS<br>%REC | MB SS<br>Limits |
|---------------------------|--------------|-----|----|------------|---------------|-----------------|
| <b>Surrogate Recovery</b> |              |     |    |            |               |                 |
| 2-Fluorophenol            | 1.21         |     |    | 1.25       | 97            | 54-131          |
| Phenol-d5                 | 1.21         |     |    | 1.25       | 97            | 52-129          |
| Nitrobenzene-d5           | 1.13         |     |    | 1.25       | 90            | 43-127          |
| 2-Fluorobiphenyl          | 1.13         |     |    | 1.25       | 91            | 42-116          |
| 2,4,6-Tribromophenol      | 0.434        |     |    | 1.25       | 35,F3         | 39-119          |
| 4-Terphenyl-d14           | 0.919        |     |    | 1.25       | 74            | 36-118          |

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CA ELAP 1644 • NELAP 4033ORELAP



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/25/2020  
**Date Analyzed:** 02/26/2020  
**Instrument:** GC21  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194583  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194583  
2002874-003AMS/MSD

### QC Summary Report for SW8270C

| Analyte                         | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD   | RPD Limit |
|---------------------------------|------------|-------------|---------|----------|-----------|-----------------|-------|-----------|
| 1,1-Biphenyl                    | 0.115      | 0.119       | 0.12    | 92       | 95        | 67-130          | 3.57  | 30        |
| 1,2,4-Trichlorobenzene          | 2.81       | 2.85        | 2.5     | 112      | 114       | 69-130          | 1.54  | 30        |
| 1,2-Dichlorobenzene             | 2.08       | 2.03        | 2.5     | 83       | 81        | 68-114          | 2.21  | 30        |
| 1,2-Diphenylhydrazine           | 2.66       | 2.67        | 2.5     | 106      | 107       | 62-142          | 0.579 | 30        |
| 1,3-Dichlorobenzene             | 2.13       | 2.05        | 2.5     | 85       | 82        | 69-116          | 3.76  | 30        |
| 1,4-Dichlorobenzene             | 2.18       | 2.13        | 2.5     | 87       | 85        | 64-117          | 2.23  | 30        |
| 1-Methylnaphthalene             | 0.115      | 0.117       | 0.12    | 92       | 93        | 65-134          | 1.63  | 30        |
| 2,4,5-Trichlorophenol           | 0.128      | 0.139       | 0.12    | 102      | 111       | 68-150          | 8.57  | 30        |
| 2,4,6-Trichlorophenol           | 0.120      | 0.132       | 0.12    | 96       | 105       | 70-144          | 9.46  | 30        |
| 2,4-Dichlorophenol              | 0.134      | 0.145       | 0.12    | 107      | 116       | 78-144          | 8.06  | 30        |
| 2,4-Dimethylphenol              | 2.73       | 2.79        | 2.5     | 109      | 111       | 71-152          | 2.08  | 30        |
| 2,4-Dinitrophenol               | 0.369      | 0.496       | 2.5     | 15       | 20        | 1-156           | 29.4  | 30        |
| 2,4-Dinitrotoluene              | 0.135      | 0.145       | 0.12    | 108      | 116       | 68-144          | 7.00  | 30        |
| 2,6-Dinitrotoluene              | 0.117      | 0.126       | 0.12    | 94       | 101       | 69-148          | 7.01  | 30        |
| 2-Chloronaphthalene             | 2.48       | 2.77        | 2.5     | 99       | 111       | 71-133          | 11.1  | 30        |
| 2-Chlorophenol                  | 0.109      | 0.111       | 0.12    | 87       | 89        | 73-133          | 1.89  | 30        |
| 2-Methylnaphthalene             | 0.110      | 0.112       | 0.12    | 88       | 90        | 72-139          | 2.35  | 30        |
| 2-Methylphenol (o-Cresol)       | 2.83       | 2.78        | 2.5     | 113      | 111       | 69-138          | 1.88  | 30        |
| 2-Nitroaniline                  | 13.9       | 14.3        | 12.5    | 111      | 114       | 72-143          | 2.68  | 30        |
| 2-Nitrophenol                   | 13.2       | 13.9        | 12.5    | 106      | 111       | 80-141          | 4.80  | 30        |
| 3 & 4-Methylphenol (m,p-Cresol) | 2.60       | 2.48        | 2.5     | 104      | 99        | 69-128          | 4.68  | 30        |
| 3,3-Dichlorobenzidine           | 0.110      | 0.115       | 0.12    | 88       | 92        | 11-163          | 4.36  | 30        |
| 3-Nitroaniline                  | 13.8       | 13.9        | 12.5    | 110      | 111       | 57-122          | 0.710 | 30        |
| 4,6-Dinitro-2-methylphenol      | 3.20       | 4.12        | 12.5    | 26       | 33        | 14-155          | 25.3  | 30        |
| 4-Bromophenyl Phenyl Ether      | 2.47       | 2.52        | 2.5     | 99       | 101       | 68-136          | 1.66  | 30        |
| 4-Chloro-3-methylphenol         | 2.65       | 2.80        | 2.5     | 106      | 112       | 78-149          | 5.60  | 30        |
| 4-Chloroaniline                 | 0.116      | 0.120       | 0.12    | 93       | 96        | 46-130          | 3.42  | 30        |
| 4-Chlorophenyl Phenyl Ether     | 2.46       | 2.57        | 2.5     | 98       | 103       | 71-132          | 4.18  | 30        |
| 4-Nitroaniline                  | 13.9       | 13.9        | 12.5    | 111      | 112       | 68-133          | 0.452 | 30        |
| 4-Nitrophenol                   | 12.6       | 13.2        | 12.5    | 101      | 105       | 67-144          | 4.08  | 30        |
| Acenaphthene                    | 0.131      | 0.136       | 0.12    | 105      | 109       | 68-134          | 3.77  | 30        |
| Acenaphthylene                  | 0.0936     | 0.0976      | 0.12    | 75       | 78        | 65-141          | 4.18  | 30        |
| Acetochlor                      | 2.59       | 2.66        | 2.5     | 104      | 106       | 65-136          | 2.82  | 30        |
| Anthracene                      | 0.150      | 0.152       | 0.12    | 120      | 121       | 65-147          | 1.25  | 30        |
| Benzidine                       | 9.52       | 9.12        | 12.5    | 76       | 73        | 7-97            | 4.36  | 30        |
| Benzo (a) anthracene            | 0.108      | 0.113       | 0.12    | 87       | 90        | 61-136          | 4.37  | 30        |
| Benzo (a) pyrene                | 0.101      | 0.109       | 0.12    | 81       | 87        | 59-150          | 7.72  | 30        |
| Benzo (b) fluoranthene          | 0.0863     | 0.0905      | 0.12    | 69       | 72        | 43-160          | 4.73  | 30        |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/25/2020  
**Date Analyzed:** 02/26/2020  
**Instrument:** GC21  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194583  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194583  
2002874-003AMS/MSD

### QC Summary Report for SW8270C

| Analyte                       | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD    | RPD Limit |
|-------------------------------|------------|-------------|---------|----------|-----------|-----------------|--------|-----------|
| Benzo (g,h,i) perylene        | 0.114      | 0.121       | 0.12    | 91       | 97        | 54-142          | 6.27   | 30        |
| Benzo (k) fluoranthene        | 0.140      | 0.142       | 0.12    | 112      | 114       | 59-141          | 1.12   | 30        |
| Benzyl Alcohol                | 12.4       | 12.1        | 12.5    | 100      | 97        | 48-145          | 2.51   | 30        |
| Bis (2-chloroethoxy) Methane  | 2.57       | 2.57        | 2.5     | 103      | 103       | 71-138          | 0.0662 | 30        |
| Bis (2-chloroethyl) Ether     | 0.0929     | 0.0909      | 0.12    | 74       | 73        | 60-128          | 2.11   | 30        |
| Bis (2-chloroisopropyl) Ether | 0.105      | 0.102       | 0.12    | 84       | 82        | 67-129          | 2.25   | 30        |
| Bis (2-ethylhexyl) Adipate    | 2.42       | 2.52        | 2.5     | 97       | 101       | 56-162          | 4.10   | 30        |
| Bis (2-ethylhexyl) Phthalate  | 0.104      | 0.110       | 0.12    | 83       | 88        | 49-168          | 5.92   | 30        |
| Butylbenzyl Phthalate         | 0.107      | 0.115       | 0.12    | 86       | 92        | 57-161          | 7.31   | 30        |
| Chrysene                      | 0.123      | 0.126       | 0.12    | 99       | 100       | 58-140          | 1.86   | 30        |
| Dibenzo (a,h) anthracene      | 0.107      | 0.114       | 0.12    | 85       | 92        | 57-151          | 7.06   | 30        |
| Dibenzofuran                  | 2.39       | 2.48        | 2.5     | 96       | 99        | 70-134          | 3.63   | 30        |
| Diethyl Phthalate             | 0.130      | 0.136       | 0.12    | 104      | 109       | 67-146          | 4.46   | 30        |
| Dimethyl Phthalate            | 0.120      | 0.125       | 0.12    | 96       | 100       | 70-135          | 3.80   | 30        |
| Di-n-butyl Phthalate          | 0.110      | 0.114       | 0.12    | 88       | 91        | 65-147          | 4.05   | 30        |
| Di-n-octyl Phthalate          | 0.0958     | 0.104       | 0.12    | 77       | 83        | 51-175          | 8.23   | 30        |
| Fluoranthene                  | 0.115      | 0.117       | 0.12    | 92       | 94        | 66-146          | 1.83   | 30        |
| Fluorene                      | 0.130      | 0.136       | 0.12    | 104      | 109       | 72-142          | 4.34   | 30        |
| Hexachlorobenzene             | 0.120      | 0.119       | 0.12    | 96       | 95        | 65-127          | 1.12   | 30        |
| Hexachlorobutadiene           | 0.116      | 0.119       | 0.12    | 93       | 96        | 68-131          | 2.54   | 30        |
| Hexachlorocyclopentadiene     | 12.2       | 13.3        | 12.5    | 97       | 106       | 38-134          | 8.58   | 30        |
| Hexachloroethane              | 0.101      | 0.0995      | 0.12    | 81       | 80        | 57-117          | 1.47   | 30        |
| Indeno (1,2,3-cd) pyrene      | 0.104      | 0.111       | 0.12    | 83       | 89        | 57-145          | 6.56   | 30        |
| Isophorone                    | 2.50       | 2.55        | 2.5     | 100      | 102       | 69-139          | 2.00   | 30        |
| Naphthalene                   | 0.108      | 0.109       | 0.12    | 86       | 87        | 64-127          | 1.41   | 30        |
| Nitrobenzene                  | 2.46       | 2.56        | 2.5     | 98       | 102       | 66-136          | 3.83   | 30        |
| N-Nitrosodi-n-propylamine     | 2.14       | 2.08        | 2.5     | 86       | 83        | 74-118          | 3.06   | 30        |
| N-Nitrosodiphenylamine        | 2.66       | 2.65        | 2.5     | 106      | 106       | 67-138          | 0.568  | 30        |
| Pentachlorophenol             | 0.412      | 0.474       | 0.62    | 66       | 76        | 50-153          | 14.0   | 30        |
| Phenanthrene                  | 0.126      | 0.126       | 0.12    | 100      | 101       | 66-129          | 0.406  | 30        |
| Phenol                        | 0.496      | 0.485       | 0.50    | 99       | 97        | 58-136          | 2.25   | 30        |
| Pyrene                        | 0.128      | 0.131       | 0.12    | 102      | 105       | 55-148          | 2.70   | 30        |
| Pyridine                      | 1.56       | 1.56        | 2.5     | 62       | 62        | 46-93           | 0.165  | 30        |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/25/2020  
**Date Analyzed:** 02/26/2020  
**Instrument:** GC21  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194583  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194583  
2002874-003AMS/MSD

### QC Summary Report for SW8270C

| Analyte                   | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD   | RPD Limit |
|---------------------------|------------|-------------|---------|----------|-----------|-----------------|-------|-----------|
| <b>Surrogate Recovery</b> |            |             |         |          |           |                 |       |           |
| 2-Fluorophenol            | 1.04       | 1.04        | 1.25    | 83       | 83        | 68-128          | 0.277 | 30        |
| Phenol-d5                 | 1.06       | 1.07        | 1.25    | 85       | 86        | 73-121          | 1.39  | 30        |
| Nitrobenzene-d5           | 1.05       | 1.12        | 1.25    | 84       | 90        | 59-138          | 7.17  | 30        |
| 2-Fluorobiphenyl          | 1.05       | 1.12        | 1.25    | 84       | 90        | 59-129          | 6.09  | 30        |
| 2,4,6-Tribromophenol      | 1.07       | 1.11        | 1.25    | 86       | 89        | 46-142          | 3.76  | 30        |
| 4-Terphenyl-d14           | 0.885      | 0.929       | 1.25    | 71       | 74        | 50-143          | 4.91  | 30        |

| Analyte                         | MS DF | MS Result | MSD Result | SPK Val | SPKRef Val | MS %REC | MSD %REC | MS/MSD Limits | RPD   | RPD Limit |
|---------------------------------|-------|-----------|------------|---------|------------|---------|----------|---------------|-------|-----------|
| 1,1-Biphenyl                    | 2     | 0.121     | 0.131      | 0.12    | ND<0.21    | 97      | 105      | 2-199         | 7.64  | 30        |
| 1,2,4-Trichlorobenzene          | 2     | 3.21      | 3.11       | 2.5     | ND<4.0     | 129     | 124      | 36-129        | 3.38  | 30        |
| 1,2-Dichlorobenzene             | 2     | 2.70      | 2.83       | 2.5     | ND<4.0     | 108     | 113      | 31-136        | 4.63  | 30        |
| 1,2-Diphenylhydrazine           | 2     | 2.45      | 2.48       | 2.5     | ND<4.0     | 98      | 99       | 37-127        | 1.01  | 30        |
| 1,3-Dichlorobenzene             | 2     | 2.65      | 2.80       | 2.5     | ND<4.0     | 106     | 112      | 33-129        | 5.37  | 30        |
| 1,4-Dichlorobenzene             | 2     | 2.73      | 2.90       | 2.5     | ND<4.0     | 109     | 116      | 30-129        | 6.16  | 30        |
| 1-Methylnaphthalene             | 2     | 0.118     | 0.126      | 0.12    | ND<0.021   | 94      | 101      | 28-150        | 6.65  | 30        |
| 2,4,5-Trichlorophenol           | 2     | 0.108     | 0.113      | 0.12    | ND<0.040   | 87      | 90       | 36-143        | 4.22  | 30        |
| 2,4,6-Trichlorophenol           | 2     | 0.100     | 0.112      | 0.12    | ND<0.21    | 80      | 90       | 30-139        | 11.6  | 30        |
| 2,4-Dichlorophenol              | 2     | 0.115     | 0.126      | 2.5     | ND<0.21    | 5,F1    | 5,F1     | 45-134        | 9.48  | 30        |
| 2,4-Dimethylphenol              | 2     | 2.17      | 2.52       | 2.5     | ND<4.0     | 87      | 101      | 27-149        | 15.0  | 30        |
| 2,4-Dinitrophenol               | 2     | 4.56      | 4.66       | 2.5     | ND<2.1     | 182,F1  | 187,F1   | 2-153         | 2.29  | 30        |
| 2,4-Dinitrotoluene              | 2     | 0.168     | 0.171      | 0.12    | ND<0.10    | NR,F16  | 137      | 20-153        | NR    | 30        |
| 2,6-Dinitrotoluene              | 2     | 0.133     | 0.144      | 0.12    | ND<0.040   | 106     | 115      | 24-153        | 8.33  | 30        |
| 2-Chloronaphthalene             | 2     | 2.53      | 2.92       | 2.5     | ND<4.0     | 101     | 117      | 35-124        | 14.3  | 30        |
| 2-Chlorophenol                  | 2     | 0.120     | 0.130      | 0.12    | ND<0.080   | 96      | 104      | 44-140        | 7.91  | 30        |
| 2-Methylnaphthalene             | 2     | 0.117     | 0.126      | 0.12    | ND<0.040   | 93      | 101      | 38-139        | 7.81  | 30        |
| 2-Methylphenol (o-Cresol)       | 2     | 2.85      | 3.60       | 2.5     | ND<8.0     | 114     | 144      | 36-145        | 23.2  | 30        |
| 2-Nitroaniline                  | 2     | 10.1      | 11.7       | 12.5    | ND<20      | 81      | 94       | 35-133        | 14.8  | 30        |
| 2-Nitrophenol                   | 2     | 9.93      | 10.4       | 12.5    | ND<20      | 79      | 83       | 38-127        | 4.46  | 30        |
| 3 & 4-Methylphenol (m,p-Cresol) | 2     | 2.66      | 2.67       | 2.5     | ND<4.0     | 106     | 107      | 29-158        | 0.601 | 30        |
| 3,3-Dichlorobenzidine           | 2     | 0.114     | 0.134      | 0.12    | ND<0.040   | 91      | 107      | 16-152        | 16.1  | 30        |
| 3-Nitroaniline                  | 2     | 10.2      | 11.5       | 12.5    | ND<20      | 82      | 92       | 32-127        | 11.8  | 30        |
| 4,6-Dinitro-2-methylphenol      | 2     | 21.8      | 22.4       | 12.5    | ND<20      | 175,F1  | 180,F1   | 2-145         | 2.69  | 30        |
| 4-Bromophenyl Phenyl Ether      | 2     | 2.32      | 2.50       | 2.5     | ND<4.0     | 93      | 100      | 34-128        | 7.64  | 30        |
| 4-Chloro-3-methylphenol         | 2     | 2.02      | 2.23       | 2.5     | ND<4.0     | 81      | 89       | 37-148        | 9.92  | 30        |

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## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/25/2020  
**Date Analyzed:** 02/26/2020  
**Instrument:** GC21  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194583  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194583  
2002874-003AMS/MSD

### QC Summary Report for SW8270C

| Analyte                       | MS<br>DF | MS<br>Result | MSD<br>Result | SPK<br>Val | SPKRef<br>Val | MS<br>%REC | MSD<br>%REC | MS/MSD<br>Limits | RPD     | RPD<br>Limit |
|-------------------------------|----------|--------------|---------------|------------|---------------|------------|-------------|------------------|---------|--------------|
| 4-Chloroaniline               | 2        | 0.0976       | 0.115         | 0.12       | ND<0.040      | 78         | 92          | 25-134           | 16.0    | 30           |
| 4-Chlorophenyl Phenyl Ether   | 2        | 2.63         | 2.68          | 2.5        | ND<4.0        | 105        | 107         | 35-131           | 2.07    | 30           |
| 4-Nitroaniline                | 2        | 11.2         | 12.2          | 12.5       | ND<20         | 89         | 97          | 34-132           | 8.50    | 30           |
| 4-Nitrophenol                 | 2        | 10.2         | 11.5          | 12.5       | ND<20         | 81         | 92          | 28-137           | 12.3    | 30           |
| Acenaphthene                  | 2        | 0.146        | 0.163         | 0.12       | ND<0.021      | 117        | 130         | 31-140           | 10.7    | 30           |
| Acenaphthylene                | 2        | 0.0902       | 0.101         | 0.12       | ND<0.021      | 72         | 80          | 23-142           | 10.9    | 30           |
| Acetochlor                    | 2        | 1.78         | 1.89          | 2.5        | ND<4.0        | 71         | 75          | 3-151            | 5.69    | 30           |
| Anthracene                    | 2        | 0.155        | 0.176         | 0.12       | 0.02157       | 107        | 124         | 27-142           | 12.8    | 30           |
| Benzidine                     | 2        | 3.49         | 4.20          | 12.5       | ND<20         | 28         | 34          | 2-88             | 18.3    | 30           |
| Benzo (a) anthracene          | 2        | 0.164        | 0.186         | 0.12       | ND<0.080      | 71         | 88          | 2-149            | 12.3    | 30           |
| Benzo (a) pyrene              | 2        | 0.127        | 0.150         | 0.12       | ND<0.040      | 80         | 98          | 15-158           | 16.3    | 30           |
| Benzo (b) fluoranthene        | 2        | 0.0968       | 0.118         | 0.62       | ND<0.10       | 9          | 13          | 2-145            | 20.0    | 30           |
| Benzo (g,h,i) perylene        | 2        | 0.147        | 0.182         | 0.12       | ND<0.040      | 88         | 116         | 4-155            | 21.5    | 30           |
| Benzo (k) fluoranthene        | 2        | 0.160        | 0.192         | 0.12       | ND<0.021      | 112        | 138         | 19-148           | 18.4    | 30           |
| Benzyl Alcohol                | 2        | 11.7         | 12.5          | 12.5       | ND<20         | 94         | 100         | 2-163            | 6.85    | 30           |
| Bis (2-chloroethoxy) Methane  | 2        | 2.46         | 2.58          | 2.5        | ND<4.0        | 98         | 103         | 35-132           | 4.88    | 30           |
| Bis (2-chloroethyl) Ether     | 2        | 0.108        | 0.117         | 0.12       | ND<0.040      | 87         | 94          | 40-140           | 7.97    | 30           |
| Bis (2-chloroisopropyl) Ether | 2        | 0.125        | 0.133         | 0.12       | ND<0.040      | 100        | 106         | 33-147           | 6.45    | 30           |
| Bis (2-ethylhexyl) Adipate    | 2        | 2.61         | 3.06          | 2.5        | ND<8.0        | 104        | 122         | 31-138           | 15.7    | 30           |
| Bis (2-ethylhexyl) Phthalate  | 2        | 0.117        | 0.159         | 0.12       | ND<0.080      | 94         | 127         | 6-195            | 30.0    | 30           |
| Butylbenzyl Phthalate         | 2        | 0.103        | 0.128         | 0.12       | ND<0.40       | 82         | 102         | 32-143           | 22.0    | 30           |
| Chrysene                      | 2        | 0.161        | 0.176         | 0.12       | ND<0.040      | 100        | 113         | 18-137           | 9.22    | 30           |
| Dibenzo (a,h) anthracene      | 2        | 0.0985       | 0.119         | 0.12       | ND<0.040      | 79         | 96          | 18-149           | 19.1    | 30           |
| Dibenzofuran                  | 2        | 2.60         | 2.75          | 2.5        | ND<4.0        | 104        | 110         | 34-132           | 5.49    | 30           |
| Diethyl Phthalate             | 2        | 0.110        | 0.128         | 0.12       | ND<0.080      | 88         | 102         | 38-146           | 14.6    | 30           |
| Dimethyl Phthalate            | 2        | 0.105        | 0.118         | 0.12       | ND<0.040      | 84         | 94          | 36-133           | 11.7    | 30           |
| Di-n-butyl Phthalate          | 2        | 0.104        | 0.120         | 0.12       | ND<0.080      | 83         | 96          | 42-145           | 14.6    | 30           |
| Di-n-octyl Phthalate          | 2        | 0.117        | 0.163         | 0.12       | ND<0.080      | 94         | 130         | 23-198           | 32.7,F1 | 30           |
| Fluoranthene                  | 2        | 0.165        | 0.192         | 0.12       | 0.07625       | 71         | 92          | 9-169            | 14.8    | 30           |
| Fluorene                      | 2        | 0.136        | 0.151         | 0.12       | ND<0.040      | 109        | 121         | 31-148           | 10.0    | 30           |
| Hexachlorobenzene             | 2        | 0.123        | 0.135         | 0.12       | ND<0.021      | 98         | 108         | 33-124           | 8.99    | 30           |
| Hexachlorobutadiene           | 2        | 0.128        | 0.134         | 0.12       | ND<0.040      | 102        | 107         | 32-131           | 4.43    | 30           |
| Hexachlorocyclopentadiene     | 2        | 12.8         | 14.6          | 12.5       | ND<32         | 103        | 117,F1      | 2-108            | 12.8    | 30           |
| Hexachloroethane              | 2        | 0.131        | 0.139         | 0.12       | ND<0.040      | 105        | 111         | 25-134           | 5.78    | 30           |
| Indeno (1,2,3-cd) pyrene      | 2        | 0.125        | 0.157         | 0.12       | ND<0.040      | 85         | 111         | 11-152           | 23.0    | 30           |
| Isophorone                    | 2        | 2.16         | 2.38          | 2.5        | ND<4.0        | 87         | 95          | 34-126           | 9.63    | 30           |
| Naphthalene                   | 2        | 0.118        | 0.125         | 0.12       | ND<0.021      | 94         | 100         | 20-146           | 6.17    | 30           |
| Nitrobenzene                  | 2        | 2.21         | 2.48          | 2.5        | ND<4.0        | 88         | 99          | 29-139           | 11.5    | 30           |

(Cont.)



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/25/2020  
**Date Analyzed:** 02/26/2020  
**Instrument:** GC21  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194583  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8270C  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194583  
2002874-003AMS/MSD

### QC Summary Report for SW8270C

| Analyte                   | MS<br>DF | MS<br>Result | MSD<br>Result | SPK<br>Val | SPKRef<br>Val | MS<br>%REC | MSD<br>%REC | MS/MSD<br>Limits | RPD   | RPD<br>Limit |
|---------------------------|----------|--------------|---------------|------------|---------------|------------|-------------|------------------|-------|--------------|
| N-Nitrosodi-n-propylamine | 2        | 2.65         | 2.50          | 2.5        | ND<4.0        | 106        | 100         | 29-146           | 5.71  | 30           |
| N-Nitrosodiphenylamine    | 2        | 2.36         | 2.68          | 2.5        | ND<4.0        | 94         | 107         | 27-130           | 12.4  | 30           |
| Pentachlorophenol         | 2        | 0.336        | 0.362         | 0.62       | ND<0.50       | 54         | 58          | 3-129            | 7.62  | 30           |
| Phenanthrene              | 2        | 0.199        | 0.218         | 0.12       | ND<0.080      | 97         | 112         | 2-176            | 9.05  | 30           |
| Phenol                    | 2        | 0.500        | 0.556         | 0.50       | ND<0.080      | 100        | 111         | 24-151           | 10.6  | 30           |
| Pyrene                    | 2        | 0.167        | 0.188         | 0.12       | 0.06383       | 82         | 99          | 17-144           | 12.0  | 30           |
| Pyridine                  | 2        | ND<4.00      | 2.10          | 2.5        | ND<4.0        | NR,F1      | 84          | 2-110            | NR    | 30           |
| <b>Surrogate Recovery</b> |          |              |               |            |               |            |             |                  |       |              |
| 2-Fluorophenol            | 2        | 1.13         | 1.15          | 1.25       |               | 91         | 92          | 56-152           | 1.40  | 30           |
| Phenol-d5                 | 2        | 0.989        | 1.12          | 1.25       |               | 79         | 90          | 54-146           | 12.5  | 30           |
| Nitrobenzene-d5           | 2        | 1.01         | 1.02          | 1.25       |               | 81         | 81          | 47-147           | 0.711 | 30           |
| 2-Fluorobiphenyl          | 2        | 1.04         | 1.19          | 1.25       |               | 83         | 95          | 46-141           | 13.4  | 30           |
| 2,4,6-Tribromophenol      | 2        | 0.793        | 0.892         | 1.25       |               | 63         | 71          | 25-166           | 11.7  | 30           |
| 4-Terphenyl-d14           | 2        | 0.772        | 0.886         | 1.25       |               | 62         | 71          | 39-153           | 13.8  | 30           |



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/25/2020  
**Instrument:** ICP-MS4  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194493  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194493

### QC Summary Report for Metals

| Analyte                   | MB Result | MDL     | RL     | SPK Val | MB SS %REC | MB SS Limits |
|---------------------------|-----------|---------|--------|---------|------------|--------------|
| Antimony                  | ND        | 0.0940  | 0.500  | -       | -          | -            |
| Arsenic                   | ND        | 0.140   | 0.500  | -       | -          | -            |
| Barium                    | ND        | 0.970   | 5.00   | -       | -          | -            |
| Beryllium                 | ND        | 0.0720  | 0.500  | -       | -          | -            |
| Cadmium                   | ND        | 0.0580  | 0.250  | -       | -          | -            |
| Chromium                  | ND        | 0.0920  | 0.500  | -       | -          | -            |
| Cobalt                    | ND        | 0.0560  | 0.500  | -       | -          | -            |
| Copper                    | ND        | 0.0690  | 0.500  | -       | -          | -            |
| Lead                      | ND        | 0.0940  | 0.500  | -       | -          | -            |
| Mercury                   | 0.00900,J | 0.00500 | 0.0500 | -       | -          | -            |
| Molybdenum                | ND        | 0.230   | 0.500  | -       | -          | -            |
| Nickel                    | ND        | 0.0720  | 0.500  | -       | -          | -            |
| Selenium                  | ND        | 0.130   | 0.500  | -       | -          | -            |
| Silver                    | ND        | 0.0550  | 0.500  | -       | -          | -            |
| Thallium                  | ND        | 0.100   | 0.500  | -       | -          | -            |
| Vanadium                  | ND        | 0.0640  | 0.500  | -       | -          | -            |
| Zinc                      | ND        | 1.40    | 5.00   | -       | -          | -            |
| <b>Surrogate Recovery</b> |           |         |        |         |            |              |
| Terbium                   | 526       |         |        | 500     | 105        | 70-130       |

(Cont.)

CA ELAP 1644 • NELAP 4033ORELAP



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/25/2020  
**Instrument:** ICP-MS4  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194493  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/kg  
**Sample ID:** MB/LCS/LCSD-194493

### QC Summary Report for Metals

| Analyte                   | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD  | RPD Limit |
|---------------------------|------------|-------------|---------|----------|-----------|-----------------|------|-----------|
| Antimony                  | 57.6       | 60.3        | 50      | 115      | 121       | 75-125          | 4.66 | 20        |
| Arsenic                   | 55.7       | 59.9        | 50      | 111      | 120       | 75-125          | 7.32 | 20        |
| Barium                    | 534        | 566         | 500     | 107      | 113       | 75-125          | 5.81 | 20        |
| Beryllium                 | 56.2       | 59.4        | 50      | 112      | 119       | 75-125          | 5.57 | 20        |
| Cadmium                   | 56.5       | 60.7        | 50      | 113      | 121       | 75-125          | 7.21 | 20        |
| Chromium                  | 54.5       | 58.5        | 50      | 109      | 117       | 75-125          | 7.01 | 20        |
| Cobalt                    | 55.4       | 58.0        | 50      | 111      | 116       | 75-125          | 4.62 | 20        |
| Copper                    | 55.8       | 59.6        | 50      | 112      | 119       | 75-125          | 6.59 | 20        |
| Lead                      | 54.0       | 57.1        | 50      | 108      | 114       | 75-125          | 5.70 | 20        |
| Mercury                   | 1.34       | 1.44        | 1.25    | 107      | 115       | 75-125          | 7.12 | 20        |
| Molybdenum                | 55.2       | 58.2        | 50      | 110      | 116       | 75-125          | 5.25 | 20        |
| Nickel                    | 55.7       | 60.0        | 50      | 111      | 120       | 75-125          | 7.44 | 20        |
| Selenium                  | 55.1       | 59.8        | 50      | 110      | 120       | 75-125          | 8.09 | 20        |
| Silver                    | 52.5       | 55.7        | 50      | 105      | 111       | 75-125          | 5.93 | 20        |
| Thallium                  | 53.2       | 56.4        | 50      | 106      | 113       | 75-125          | 5.89 | 20        |
| Vanadium                  | 54.6       | 58.6        | 50      | 109      | 117       | 75-125          | 7.09 | 20        |
| Zinc                      | 557        | 602         | 500     | 111      | 120       | 75-125          | 7.69 | 20        |
| <b>Surrogate Recovery</b> |            |             |         |          |           |                 |      |           |
| Terbium                   | 576        | 605         | 500     | 115      | 121       | 70-130          | 4.94 | 20        |



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC19, GC7  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194495  
**Extraction Method:** SW5035  
**Analytical Method:** SW8021B/8015Bm  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194495  
2002874-001AMS/MSD

### QC Summary Report for SW8021B/8015Bm

| Analyte                   | MB Result | MDL     | RL      | SPK Val | MB SS %REC | MB SS Limits |
|---------------------------|-----------|---------|---------|---------|------------|--------------|
| TPH(g) (C6-C12)           | ND        | 0.700   | 1.00    | -       | -          | -            |
| MTBE                      | ND        | 0.00400 | 0.0500  | -       | -          | -            |
| Benzene                   | ND        | 0.00300 | 0.00500 | -       | -          | -            |
| Toluene                   | ND        | 0.00200 | 0.00500 | -       | -          | -            |
| Ethylbenzene              | ND        | 0.00220 | 0.00500 | -       | -          | -            |
| m,p-Xylene                | ND        | 0.00300 | 0.0100  | -       | -          | -            |
| o-Xylene                  | ND        | 0.00100 | 0.00500 | -       | -          | -            |
| <b>Surrogate Recovery</b> |           |         |         |         |            |              |
| 2-Fluorotoluene           | 0.0944    |         |         | 0.1     | 94         | 75-134       |



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 02/25/2020  
**Instrument:** GC19, GC7  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194495  
**Extraction Method:** SW5035  
**Analytical Method:** SW8021B/8015Bm  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194495  
2002874-001AMS/MSD

### QC Summary Report for SW8021B/8015Bm

| Analyte      | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD   | RPD Limit |
|--------------|------------|-------------|---------|----------|-----------|-----------------|-------|-----------|
| TPH(btex)    | 0.529      | 0.520       | 0.60    | 88       | 87        | 82-118          | 1.54  | 20        |
| MTBE         | 0.0779     | 0.0786      | 0.10    | 78       | 79        | 61-119          | 0.794 | 20        |
| Benzene      | 0.0987     | 0.0954      | 0.10    | 99       | 95        | 77-128          | 3.36  | 20        |
| Toluene      | 0.0997     | 0.0969      | 0.10    | 100      | 97        | 74-132          | 2.79  | 20        |
| Ethylbenzene | 0.101      | 0.0982      | 0.10    | 101      | 98        | 84-127          | 2.66  | 20        |
| m,p-Xylene   | 0.208      | 0.203       | 0.20    | 104      | 102       | 80-120          | 2.35  | 20        |
| o-Xylene     | 0.101      | 0.0995      | 0.10    | 101      | 99        | 80-120          | 1.94  | 20        |

#### Surrogate Recovery

|                 |        |        |      |    |    |        |      |    |
|-----------------|--------|--------|------|----|----|--------|------|----|
| 2-Fluorotoluene | 0.0977 | 0.0962 | 0.10 | 98 | 96 | 75-134 | 1.49 | 20 |
|-----------------|--------|--------|------|----|----|--------|------|----|

| Analyte      | MS DF | MS Result | MSD Result | SPK Val | SPKRef Val | MS %REC | MSD %REC | MS/MSD Limits | RPD   | RPD Limit |
|--------------|-------|-----------|------------|---------|------------|---------|----------|---------------|-------|-----------|
| TPH(btex)    | 1     | 0.588     | 0.596      | 0.60    | ND         | 98      | 99       | 58-129        | 1.34  | 20        |
| MTBE         | 1     | 0.110     | 0.108      | 0.10    | ND         | 104     | 102      | 47-118        | 1.47  | 20        |
| Benzene      | 1     | 0.0946    | 0.0959     | 0.10    | ND         | 95      | 96       | 55-129        | 1.37  | 20        |
| Toluene      | 1     | 0.0992    | 0.100      | 0.10    | ND         | 96      | 97       | 56-130        | 1.09  | 20        |
| Ethylbenzene | 1     | 0.0986    | 0.0998     | 0.10    | ND         | 99      | 100      | 63-129        | 1.24  | 20        |
| m,p-Xylene   | 1     | 0.206     | 0.212      | 0.20    | ND         | 101     | 103      | 80-120        | 2.74  | 20        |
| o-Xylene     | 1     | 0.0966    | 0.0974     | 0.10    | ND         | 94      | 95       | 80-120        | 0.765 | 20        |

#### Surrogate Recovery

|                 |   |        |        |      |  |    |    |        |      |    |
|-----------------|---|--------|--------|------|--|----|----|--------|------|----|
| 2-Fluorotoluene | 1 | 0.0936 | 0.0952 | 0.10 |  | 94 | 95 | 62-126 | 1.73 | 20 |
|-----------------|---|--------|--------|------|--|----|----|--------|------|----|

(Cont.)



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/26/2020  
**Date Analyzed:** 02/27/2020  
**Instrument:** GC3  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194701  
**Extraction Method:** SW5035  
**Analytical Method:** SW8021B/8015Bm  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194701

### QC Summary Report for SW8021B/8015Bm

| Analyte         | MB Result | MDL     | RL      | SPK Val | MB SS %REC | MB SS Limits |
|-----------------|-----------|---------|---------|---------|------------|--------------|
| TPH(g) (C6-C12) | ND        | 0.700   | 1.00    | -       | -          | -            |
| MTBE            | ND        | 0.00400 | 0.0500  | -       | -          | -            |
| Benzene         | ND        | 0.00300 | 0.00500 | -       | -          | -            |
| Toluene         | ND        | 0.00200 | 0.00500 | -       | -          | -            |
| Ethylbenzene    | ND        | 0.00220 | 0.00500 | -       | -          | -            |
| m,p-Xylene      | ND        | 0.00300 | 0.0100  | -       | -          | -            |
| o-Xylene        | ND        | 0.00100 | 0.00500 | -       | -          | -            |

#### Surrogate Recovery

|                 |        |  |     |    |        |
|-----------------|--------|--|-----|----|--------|
| 2-Fluorotoluene | 0.0927 |  | 0.1 | 93 | 75-134 |
|-----------------|--------|--|-----|----|--------|

| Analyte      | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD   | RPD Limit |
|--------------|------------|-------------|---------|----------|-----------|-----------------|-------|-----------|
| TPH(btex)    | 0.576      | 0.569       | 0.60    | 96       | 95        | 82-118          | 1.16  | 20        |
| MTBE         | 0.0861     | 0.0922      | 0.10    | 86       | 92        | 61-119          | 6.85  | 20        |
| Benzene      | 0.0957     | 0.0965      | 0.10    | 96       | 97        | 77-128          | 0.867 | 20        |
| Toluene      | 0.0995     | 0.100       | 0.10    | 100      | 100       | 74-132          | 0.809 | 20        |
| Ethylbenzene | 0.0986     | 0.100       | 0.10    | 99       | 100       | 84-127          | 1.62  | 20        |
| m,p-Xylene   | 0.200      | 0.202       | 0.20    | 100      | 101       | 80-120          | 1.00  | 20        |
| o-Xylene     | 0.0960     | 0.0971      | 0.10    | 96       | 97        | 80-120          | 1.16  | 20        |

#### Surrogate Recovery

|                 |        |        |      |    |    |        |       |    |
|-----------------|--------|--------|------|----|----|--------|-------|----|
| 2-Fluorotoluene | 0.0948 | 0.0958 | 0.10 | 95 | 96 | 75-134 | 0.998 | 20 |
|-----------------|--------|--------|------|----|----|--------|-------|----|



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.  
**Date Prepared:** 02/24/2020  
**Date Analyzed:** 02/24/2020 - 03/02/2020  
**Instrument:** GC31A, GC31B  
**Matrix:** Soil  
**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874  
**BatchID:** 194496  
**Extraction Method:** SW3550B  
**Analytical Method:** SW8015B  
**Unit:** mg/Kg  
**Sample ID:** MB/LCS/LCSD-194496  
2002874-001AMS/MSD

### QC Report for SW8015B w/out SG Clean-Up

| Analyte                 | MB Result | MDL   | RL   | SPK Val | MB SS %REC | MB SS Limits |
|-------------------------|-----------|-------|------|---------|------------|--------------|
| TPH-Diesel (C10-C23)    | ND        | 0.830 | 1.00 | -       | -          | -            |
| TPH-Motor Oil (C18-C36) | ND        | 3.80  | 5.00 | -       | -          | -            |

#### Surrogate Recovery

|    |      |  |  |    |    |        |
|----|------|--|--|----|----|--------|
| C9 | 23.3 |  |  | 25 | 93 | 70-130 |
|----|------|--|--|----|----|--------|

| Analyte              | LCS Result | LCSD Result | SPK Val | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD   | RPD Limit |
|----------------------|------------|-------------|---------|----------|-----------|-----------------|-------|-----------|
| TPH-Diesel (C10-C23) | 45.3       | 45.2        | 40      | 113      | 113       | 70-130          | 0.180 | 20        |

#### Surrogate Recovery

|    |      |      |    |    |    |        |       |    |
|----|------|------|----|----|----|--------|-------|----|
| C9 | 23.1 | 22.9 | 25 | 92 | 92 | 70-130 | 0.919 | 20 |
|----|------|------|----|----|----|--------|-------|----|

| Analyte              | MS DF | MS Result | MSD Result | SPK Val | SPKRef Val | MS %REC | MSD %REC | MS/MSD Limits | RPD  | RPD Limit |
|----------------------|-------|-----------|------------|---------|------------|---------|----------|---------------|------|-----------|
| TPH-Diesel (C10-C23) | 1     | 44.8      | 44.1       | 40      | 17.23      | 69,F1   | 67,F1    | 70-130        | 1.58 | 20        |

#### Surrogate Recovery

|    |   |      |      |    |  |    |    |        |       |    |
|----|---|------|------|----|--|----|----|--------|-------|----|
| C9 | 1 | 24.2 | 24.3 | 25 |  | 97 | 97 | 70-130 | 0.510 | 20 |
|----|---|------|------|----|--|----|----|--------|-------|----|

# McC Campbell Analytical, Inc.



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

☐ WaterTrax ☐ WriteOn ☐ EDF

# CHAIN-OF-CUSTODY RECORD

Page 1 of 1

WorkOrder: 2002874

ClientCode: GESIS

☐ Excel ☒ EQulS ☐ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag  
☐ Detection Summary ☒ Dry-Weight

## Report to:

Nicolas Haddad  
Geo-Engineering Solutions, Inc.  
2570 San Ramon Valley Blvd A102  
San Ramon, CA 94583  
(925) 215-7789 FAX:

Email: nhaddad@geo-eng.net  
cc/3rd Party:  
PO: 1225  
Project: 78-1225; San Pablo

## Bill to:

Colin Frost  
Geo-Engineering Solutions, Inc.  
2570 San Ramon Valley Blvd A102  
San Ramon, CA 94583  
cfrost@geo-eng.net; aghosheh@geo-en

Requested TAT: 5 days;

**Date Received:** 02/24/2020

**Date Logged:** 02/24/2020

| Lab ID      | Client ID | Matrix | Collection Date | Hold                     | Requested Tests (See legend below) |   |   |   |   |   |   |   |   |    |    |    |
|-------------|-----------|--------|-----------------|--------------------------|------------------------------------|---|---|---|---|---|---|---|---|----|----|----|
|             |           |        |                 |                          | 1                                  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2002874-001 | S-1       | Soil   | 2/24/2020 00:00 | <input type="checkbox"/> | A                                  | A | A | A | A | A | A | A |   |    |    |    |
| 2002874-002 | S-2       | Soil   | 2/24/2020 00:00 | <input type="checkbox"/> | A                                  | A | A | A | A | A | A | A |   |    |    |    |
| 2002874-003 | S-3       | Soil   | 2/24/2020 00:00 | <input type="checkbox"/> | A                                  | A | A | A | A | A | A | A |   |    |    |    |

## Test Legend:

|   |             |
|---|-------------|
| 1 | 8081PCB_S   |
| 5 | CARB435_400 |
| 9 |             |

|    |           |
|----|-----------|
| 2  | 8260B_S   |
| 6  | G-MBTEx_S |
| 10 |           |

|    |                |
|----|----------------|
| 3  | 8270_SCSM_S    |
| 7  | PRDisposal Fee |
| 11 |                |

|    |                |
|----|----------------|
| 4  | CAM17MS_TTLC_S |
| 8  | TPH(DMO)_S     |
| 12 |                |

Project Manager: Angela Rydelius

Prepared by: Tina Perez

## Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.



McC Campbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269  
http://www.mccampbell.com / E-mail: main@mccampbell.com

## WORK ORDER SUMMARY

**Client Name:** GEO-ENGINEERING SOLUTIONS, INC.

**Project:** 78-1225; San Pablo

**Work Order:** 2002874

**Client Contact:** Nicolas Haddad

**QC Level:** LEVEL 2

**Contact's Email:** nhaddad@geo-eng.net

**Comments:**

**Date Logged:** 2/24/2020

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☒ EQUIS ☐ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

| Lab ID       | Client ID | Matrix | Test Name                         | Containers /Composites | Bottle & Preservative | De-chlorinated           | Collection Date & Time | TAT    | Sediment Content | Hold                     | SubOut |
|--------------|-----------|--------|-----------------------------------|------------------------|-----------------------|--------------------------|------------------------|--------|------------------|--------------------------|--------|
| 2002874-001A | S-1       | Soil   | SW8015B (Diesel & Motor Oil)      | 1                      | 8OZ GJ, Unpres        | <input type="checkbox"/> | 2/24/2020              | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8021B/8015Bm (G/MBTEX)          |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | Asbestos, CARB 435, 400 Point     |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW6020 (CAM 17)                   |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8270C (SVOCs)                   |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8260B (VOCs)                    |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8081A/8082 (OC Pesticides+PCBs) |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
| 2002874-002A | S-2       | Soil   | SW8015B (Diesel & Motor Oil)      | 1                      | 8OZ GJ, Unpres        | <input type="checkbox"/> | 2/24/2020              | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8021B/8015Bm (G/MBTEX)          |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | Asbestos, CARB 435, 400 Point     |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW6020 (CAM 17)                   |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8270C (SVOCs)                   |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8260B (VOCs)                    |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8081A/8082 (OC Pesticides+PCBs) |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |
| 2002874-003A | S-3       | Soil   | SW8015B (Diesel & Motor Oil)      | 1                      | 8OZ GJ, Unpres        | <input type="checkbox"/> | 2/24/2020              | 5 days |                  | <input type="checkbox"/> |        |
|              |           |        | SW8021B/8015Bm (G/MBTEX)          |                        |                       | <input type="checkbox"/> |                        | 5 days |                  | <input type="checkbox"/> |        |

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.



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http://www.mccampbell.com / E-mail: main@mccampbell.com

## WORK ORDER SUMMARY

**Client Name:** GEO-ENGINEERING SOLUTIONS, INC.

**Project:** 78-1225; San Pablo

**Work Order:** 2002874

**Client Contact:** Nicolas Haddad

**QC Level:** LEVEL 2

**Contact's Email:** nhaddad@geo-eng.net

**Comments:**

**Date Logged:** 2/24/2020

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☒ EQUIS ☐ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

| Lab ID       | Client ID | Matrix | Test Name                         | Containers<br>/Composites | Bottle & Preservative | De-<br>chlorinated       | Collection Date<br>& Time | TAT    | Sediment<br>Content | Hold                     | SubOut |
|--------------|-----------|--------|-----------------------------------|---------------------------|-----------------------|--------------------------|---------------------------|--------|---------------------|--------------------------|--------|
| 2002874-003A | S-3       | Soil   | Asbestos, CARB 435, 400 Point     | 1                         | 8OZ GJ, Unpres        | <input type="checkbox"/> | 2/24/2020                 | 5 days |                     | <input type="checkbox"/> |        |
|              |           |        | SW6020 (CAM 17)                   |                           |                       | <input type="checkbox"/> |                           | 5 days |                     | <input type="checkbox"/> |        |
|              |           |        | SW8270C (SVOCs)                   |                           |                       | <input type="checkbox"/> |                           | 5 days |                     | <input type="checkbox"/> |        |
|              |           |        | SW8260B (VOCs)                    |                           |                       | <input type="checkbox"/> |                           | 5 days |                     | <input type="checkbox"/> |        |
|              |           |        | SW8081A/8082 (OC Pesticides+PCBs) |                           |                       | <input type="checkbox"/> |                           | 5 days |                     | <input type="checkbox"/> |        |

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

Page 60 of 61



## Sample Receipt Checklist

Client Name: **Geo-Engineering Solutions, Inc.**  
Project: **78-1225; San Pablo**

Date and Time Received: **2/24/2020 13:04**

Date Logged: **2/24/2020**

Received by: **Tina Perez**

Logged by: **Tina Perez**

WorkOrder No: **2002874** Matrix: Soil  
Carrier: Client Drop-In

### Chain of Custody (COC) Information

|                                                         |                                         |                                        |                                        |
|---------------------------------------------------------|-----------------------------------------|----------------------------------------|----------------------------------------|
| Chain of custody present?                               | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/>            |                                        |
| Chain of custody signed when relinquished and received? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/>            |                                        |
| Chain of custody agrees with sample labels?             | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/>            |                                        |
| Sample IDs noted by Client on COC?                      | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/>            |                                        |
| Date and Time of collection noted by Client on COC?     | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/>            |                                        |
| Sampler's name noted on COC?                            | Yes <input type="checkbox"/>            | No <input checked="" type="checkbox"/> |                                        |
| COC agrees with Quote?                                  | Yes <input type="checkbox"/>            | No <input type="checkbox"/>            | NA <input checked="" type="checkbox"/> |

### Sample Receipt Information

|                                                    |                                         |                             |                                        |
|----------------------------------------------------|-----------------------------------------|-----------------------------|----------------------------------------|
| Custody seals intact on shipping container/cooler? | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/> |
| Shipping container/cooler in good condition?       | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |                                        |
| Samples in proper containers/bottles?              | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |                                        |
| Sample containers intact?                          | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |                                        |
| Sufficient sample volume for indicated test?       | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |                                        |

### Sample Preservation and Hold Time (HT) Information

|                                           |                                         |                             |                             |
|-------------------------------------------|-----------------------------------------|-----------------------------|-----------------------------|
| All samples received within holding time? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | NA <input type="checkbox"/> |
| Samples Received on Ice?                  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |                             |

(Ice Type: WET ICE )

|                                                                                        |                                                                     |                                        |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------|
| Sample/Temp Blank temperature                                                          | Temp: 5.6°C                                                         | NA <input type="checkbox"/>            |
| Water - VOA vials have zero headspace / no bubbles?                                    | Yes <input type="checkbox"/> No <input type="checkbox"/>            | NA <input checked="" type="checkbox"/> |
| Sample labels checked for correct preservation?                                        | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |                                        |
| pH acceptable upon receipt (Metal: <2; Nitrate 353.2/4500NO3: <2; 522: <4; 218.7: >8)? | Yes <input type="checkbox"/> No <input type="checkbox"/>            | NA <input checked="" type="checkbox"/> |

### UCMR Samples:

|                                                                                                  |                                                          |                                        |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------|
| pH tested and acceptable upon receipt (200.8: ≤2; 525.3: ≤4; 530: ≤7; 541: <3; 544: <6.5 & 7.5)? | Yes <input type="checkbox"/> No <input type="checkbox"/> | NA <input checked="" type="checkbox"/> |
| Free Chlorine tested and acceptable upon receipt (<0.1mg/L)?                                     | Yes <input type="checkbox"/> No <input type="checkbox"/> | NA <input checked="" type="checkbox"/> |

Comments:



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## Analytical Report

**WorkOrder:** 2002874 A

**Report Created for:** Geo-Engineering Solutions, Inc.

2570 San Ramon Valley Blvd A102  
San Ramon, CA 94583

**Project Contact:** Nicolas Haddad

**Project P.O.:** 1225

**Project:** 78-1225; San Pablo

**Project Received:** 02/24/2020

Analytical Report reviewed & approved for release on 03/09/2020 by:

Susan Thompson  
Project Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.*





## Glossary of Terms & Qualifier Definitions

**Client:** Geo-Engineering Solutions, Inc.

**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874 A

### Glossary Abbreviation

|              |                                                                                          |
|--------------|------------------------------------------------------------------------------------------|
| %D           | Serial Dilution Percent Difference                                                       |
| 95% Interval | 95% Confident Interval                                                                   |
| CPT          | Consumer Product Testing not NELAP Accredited                                            |
| DF           | Dilution Factor                                                                          |
| DI WET       | (DISTLC) Waste Extraction Test using DI water                                            |
| DISS         | Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)               |
| DLT          | Dilution Test (Serial Dilution)                                                          |
| DUP          | Duplicate                                                                                |
| EDL          | Estimated Detection Limit                                                                |
| ERS          | External reference sample. Second source calibration verification.                       |
| ITEF         | International Toxicity Equivalence Factor                                                |
| LCS          | Laboratory Control Sample                                                                |
| LQL          | Lowest Quantitation Level                                                                |
| MB           | Method Blank                                                                             |
| MB % Rec     | % Recovery of Surrogate in Method Blank, if applicable                                   |
| MDL          | Method Detection Limit                                                                   |
| ML           | Minimum Level of Quantitation                                                            |
| MS           | Matrix Spike                                                                             |
| MSD          | Matrix Spike Duplicate                                                                   |
| N/A          | Not Applicable                                                                           |
| ND           | Not detected at or above the indicated MDL or RL                                         |
| NR           | Data Not Reported due to matrix interference or insufficient sample amount.              |
| PDS          | Post Digestion Spike                                                                     |
| PDSD         | Post Digestion Spike Duplicate                                                           |
| PF           | Prep Factor                                                                              |
| RD           | Relative Difference                                                                      |
| RL           | Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.) |
| RPD          | Relative Percent Deviation                                                               |
| RRT          | Relative Retention Time                                                                  |
| SPK Val      | Spike Value                                                                              |
| SPKRef Val   | Spike Reference Value                                                                    |
| SPLP         | Synthetic Precipitation Leachate Procedure                                               |
| ST           | Sorbent Tube                                                                             |
| TCLP         | Toxicity Characteristic Leachate Procedure                                               |
| TEQ          | Toxicity Equivalents                                                                     |
| TZA          | TimeZone Net Adjustment for sample collected outside of MAI's UTC.                       |
| WET (STLC)   | Waste Extraction Test (Soluble Threshold Limit Concentration)                            |



## Analytical Report

**Client:** Geo-Engineering Solutions, Inc.

**Date Received:** 02/24/2020 13:04

**Date Prepared:** 03/03/2020

**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874

**Extraction Method:** CA Title 22

**Analytical Method:** SW6020

**Unit:** mg/L

### Metals (STLC)

| Client ID | Lab ID       | Matrix | Date Collected | Instrument        | Batch ID |
|-----------|--------------|--------|----------------|-------------------|----------|
| S-2       | 2002874-002A | Soil   | 02/24/2020     | ICP-MS4 784SMPL.d | 195048   |

| <u>Analytes</u> | <u>Result</u> | <u>RL</u> | <u>DF</u> | <u>Date Analyzed</u> |
|-----------------|---------------|-----------|-----------|----------------------|
| Chromium        | ND            | 0.10      | 1         | 03/05/2020 23:34     |

Analyst(s): DB



## Quality Control Report

**Client:** Geo-Engineering Solutions, Inc.

**Date Prepared:** 03/03/2020

**Date Analyzed:** 03/05/2020

**Instrument:** ICP-MS4

**Matrix:** Soil

**Project:** 78-1225; San Pablo

**WorkOrder:** 2002874

**BatchID:** 195048

**Extraction Method:** CA Title 22

**Analytical Method:** SW6020

**Unit:** mg/L

**Sample ID:** MB/LCS/LCSD-195048

### QC Summary Report for Metals (STLC)

| Analyte  | MB<br>Result | MDL   | RL    |   |   |   |
|----------|--------------|-------|-------|---|---|---|
| Chromium | ND           | 0.100 | 0.100 | - | - | - |

| Analyte  | LCS<br>Result | LCSD<br>Result | SPK<br>Val | LCS<br>%REC | LCSD<br>%REC | LCS/LCSD<br>Limits | RPD    | RPD<br>Limit |
|----------|---------------|----------------|------------|-------------|--------------|--------------------|--------|--------------|
| Chromium | 9.39          | 9.39           | 10         | 94          | 94           | 75-125             | 0.0341 | 20           |



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

☐ WaterTrax ☐ WriteOn ☐ EDF

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 2002874 A

ClientCode: GESIS

☐ Excel ☒ EQulS ☐ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag  
☐ Detection Summary ☒ Dry-Weight

**Report to:**

Nicolas Haddad  
Geo-Engineering Solutions, Inc.  
2570 San Ramon Valley Blvd A102  
San Ramon, CA 94583  
(925) 215-7789 FAX:

Email: nhaddad@geo-eng.net  
cc/3rd Party:  
PO: 1225  
Project: 78-1225; San Pablo

**Bill to:**

Colin Frost  
Geo-Engineering Solutions, Inc.  
2570 San Ramon Valley Blvd A102  
San Ramon, CA 94583  
cfrost@geo-eng.net; aghosheh@geo-en

Requested TAT: 5 days;

**Date Received:** 02/24/2020

**Date Logged:** 02/24/2020

**Date Add-On:** 03/02/2020

| Lab ID      | Client ID | Matrix | Collection Date | Hold                     | Requested Tests (See legend below) |   |   |   |   |   |   |   |   |    |    |    |
|-------------|-----------|--------|-----------------|--------------------------|------------------------------------|---|---|---|---|---|---|---|---|----|----|----|
|             |           |        |                 |                          | 1                                  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2002874-002 | S-2       | Soil   | 2/24/2020 00:00 | <input type="checkbox"/> | A                                  |   |   |   |   |   |   |   |   |    |    |    |

**Test Legend:**

|   |             |    |  |    |  |    |  |
|---|-------------|----|--|----|--|----|--|
| 1 | CRMS_STLC_S | 2  |  | 3  |  | 4  |  |
| 5 |             | 6  |  | 7  |  | 8  |  |
| 9 |             | 10 |  | 11 |  | 12 |  |

**Project Manager:** Angela Rydelius

**Prepared by:** Tina Perez

**Add-On Prepared By:** Kena Ponce

**Comments:** STLC Cr added 3/2/20 STAT

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.



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## WORK ORDER SUMMARY

**Client Name:** GEO-ENGINEERING SOLUTIONS, INC.

**Project:** 78-1225; San Pablo

**Work Order:** 2002874

**Client Contact:** Nicolas Haddad

**QC Level:** LEVEL 2

**Contact's Email** [nhaddad@geo-eng.net](mailto:nhaddad@geo-eng.net)

**Comments:** STLC Cr added 3/2/20 STAT

**Date Logged:** 2/24/2020

**Date Add-On:** 3/2/2020

| Lab ID       | Client ID | Matrix | Test Name                | Containers<br>/Composites | Bottle & Preservative | Collection Date<br>& Time | TAT     | Sediment<br>Content | Hold                     | SubOut |
|--------------|-----------|--------|--------------------------|---------------------------|-----------------------|---------------------------|---------|---------------------|--------------------------|--------|
| 2002874-002A | S-2       | Soil   | SW6020 (Chromium) (STLC) | 1                         | 8OZ GJ, Unpres        | 2/24/2020                 | 5 days* |                     | <input type="checkbox"/> |        |

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

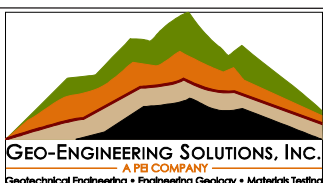
- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

Matrix Code: DW=Drinking Water, GW=Ground Water, WW=Waste Water, SW=Seawater, S=Soil, SL=Sludge, A=Air, WP=Wipe, O=Other  
Preservative Code: 1=4°C 2=HCl 3=H<sub>2</sub>SO<sub>4</sub> 4=HNO<sub>3</sub> 5=NaOH 6=ZnOAc/NaOH 7=None

Page of




 Approximate Soil Sample Location



**Residential Development**  
**2364 Rd 20**  
**San Pablo, CA**

73-1225

March 2020

**Site Map and CPT**  
**Locations**

**Figure 1**