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RESPONSE TO CEC STAFF DATA REQUEST SET 2 (1-92)

Great Oaks South Backup Generating Facility (19-SPPE-03)

SUBMITTED TO: CALIFORNIA ENERGY COMMISSION

SUBMITTED BY: **SV1, LLC**

May 2020

DAYZEN LLC

INTRODUCTION

Attached are SV1, LLC's (SV1) responses to California Energy Commission (CEC) Staff Data Request Set No. 2 (1-64) for the Great Oaks South Backup Generation Facility (SBGF) Application for Small Power Plant Exemption (SPPE) (20-SPPE-01). Staff issued Data Request Set No. 1 (1-64) on April 16, 2020.

The Data Responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as Staff presented them and are keyed to the Data Request numbers (1-64). Additional tables, figures, or documents submitted in response to a data request (e.g., supporting data, stand-alone documents such as plans, folding graphics, etc.) are found in Attachments at the end of the document and labeled with the Data Request Number for ease of reference.

For context the text of the Background and Data Request precede each Data Response.

GENERAL OBJECTIONS

SV1 objects to all data requests that require analysis beyond which is necessary to comply with the California Environmental Quality Act (CEQA) or which requires SV1 to provide data that is in the control of third parties and not reasonably available to SV1. SV1 encourages Staff to follow the clear directions in the CEQA guidelines to minimize duplicative analyses and to "tier" off of the prior IS/MND and City of San Jose Approval and therefor to focus its analysis on the changes to the project that were not evaluated in the prior IS/MND. Notwithstanding this objection, SV1 has worked diligently to provide these responses swiftly to allow the CEC Staff to prepare the Initial Study/Mitigated Negative Declaration (IS/MND).

AIR QUALITY AND PUBLIC HEALTH

BACKGROUND: Air Quality District Application

The proposed project would require a permit from the Bay Area Air Quality Management District (district or BAAQMD). For purposes of consistency, staff needs copies of all correspondence between the applicant and the district in a timely manner in order to stay up to date on any issues that arise prior to completion of the initial study.

DATA REQUEST

1. Please provide copies of all substantive district correspondence regarding the application to the district, including e-mails, within one week of submittal or receipt. This request is in effect until staff publishes the initial study.

RESPONSE TO DATA REQUEST 1

SV1 will provide the CEC Staff with copies of all BAAQMD correspondence, including emails, within one week of submittal/receipt. To date no submittals have been made

BACKGROUND: CALEEMOD Modeling Files

The applicant used CalEEMod to estimate construction emissions (shown in Table 4.5-6 of the SPPE application) and miscellaneous operational emissions (shown in Table 4.5- 15). To validate the applicant's work, staff requests the CalEEMod input and output files that the applicant used to estimate emissions.

DATA REQUEST

2. Please provide the CalEEMod input and output files used to estimate construction emissions (shown in Table 4.5-6) and miscellaneous operational emissions (shown in Table 4.5-15).

RESPONSE TO DATA REQUEST 2

The CalEEMod input and output files are attached and included as an electronic copy.

BACKGROUND: Construction Impacts Analysis

The applicant provided ground-level impacts analysis for criteria pollutants during maintenance and testing of the standby engines of the project. The applicant also provided health risks assessment for the construction period. However, the applicant did not provide ground-level impacts analysis for criteria pollutants during construction of the project. Staff needs a construction modeling analysis or justification for not doing ground-level impacts analysis for criteria pollutants during construction of the project.

DATA REQUESTS

3. Please justify why ground-level impacts analysis was not done for criteria pollutants during construction of the project.

RESPONSE TO DATA REQUEST 3

Ground level impacts of PM2.5 were calculated for the construction phase, consistent with the BAAQMD CEQA Guidelines and were presented in the application. The BAAQMD CEQA Guidelines do not require the impacts to air quality during construction for the criteria pollutants of NO_x, CO, PM10 and SO_2.

4. Please provide ground-level impacts analysis for criteria pollutants during construction of the project to show compliance with the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

RESPONSE TO DATA REQUEST 4

The analysis requested is underway and will be submitted under separate cover on or before May 22, 2020.

BACKGROUND: Construction Period

Section 2.2.13 on page 18 of the SPPE application (TN 232466) states that:

> ***Project construction includes three separate phases for each of the three buildings. Construction of the first GOSDC building, SV12, would begin in the fourth quarter of 2020 and is anticipated to***

finish in the first quarter of 2022, for a total of up to 15 months. Construction of the second GOSDC building, SV18, would begin in the second quarter of 2023 and is anticipated to finish in the fourth quarter of 2024, for a total of up to 18 months. Construction of the third GOSDC building, SV19, would begin in the second quarter of 2026 and is anticipated to finish in the fourth quarter of 2027, for a total of up to 18 months.

The total construction period would be up to 51 (=15+18+18) months spreading over different years. However, section 4.5.2.2 on page 70 of the SPPE application states that emissions from the 47-month construction period were estimated using the CalEEMod program. Pages 76 and 77 of 283 of the SPPE application Appendices A-F (TN 232467-1) show that construction start date was set as 7-8-2020 and end date was set as 9-30- 2024 in CalEEMod. The total number of modeled months is about 51 months, which agrees with the description in section 2.2.13. However, the applicant used CalEEMod to estimate the construction emissions continuously from 7-8-2020 to 9-30-2024, while section 2.2.13 shows that the three construction phases would not be continuous. In addition, the 47-month construction period shown in section 4.5.2.2 does not agree with the assumptions in CalEEMod or section 2.2.13 (51 months). Staff would like to have a clarification on the length of the construction period. Staff would also like to know why it would take so much time to construct the proposed project, while it would only take less than 2 years (24 months) to construct other data centers.

DATA REQUESTS

5. Please explain why it would take so much time to construct the proposed project.

<u>RESPONSE TO DATA REQUEST 5</u>

The construction period of 51 months is the best estimate provided by the applicant, and it includes construction downtime between phases, as well as construction lag time which is planned for at the start of the construction, and at the end of construction. The length of construction period consists of design, permit approval process thru the building department and then actual construction for each new building. The 47 month period represents the best estimate of continuous construction for purposes of estimating emissions. This is the period used in the CalEEMod construction emissions calculations.

6. Please clarify the length of the construction period.

RESPONSE TO DATA REQUEST 6

The actual construction period for the buildings, parking lots, engine pad areas, and support infrastructure, will be approximately 4 years (47 months). The start and end dates of the construction period are based upon the best estimate supplied by the Applicant. The 51 month period included construction downtime between phases and lag times between the start and end of construction.

7. Please explain whether CalEEMod provides conservative emissions estimates assuming continuous construction period, rather than using the construction schedule specified in section 2.2.13.

RESPONSE TO DATA REQUEST 7

CalEEMod, as run for this project, provides conservative estimates of emissions for the primary continuous construction period of 47 months (~4 years).

BACKGROUND: Construction Off-Road Equipment Mitigation

Page 69 of 283 of the SPPE application Appendices A-F (TN 232467-1) shows that the applicant assumed Tier 3 engines for the construction period (2020-2024) as construction off-road equipment mitigation. As the construction equipment and vehicle fleet would likely contain a mix of Tier 3 and earlier engines, staff would like to know if the applicant would incorporate a mitigation measure to enforce the use of Tier 3 engines.

DATA REQUESTS

8. Please propose a mitigation measure to require Tier 3 or better off-road equipment to be used during construction of the project.

RESPONSE TO DATA REQUEST 8

The Applicant prepared its construction analysis based on the assumption that the CEC would require the use of Tier 3 construction equipment as it has done on previous more recent power plant projects. The Applicant is not aware of any situation that would preclude its use of Tier 3 construction equipment. As such the Applicant is not opposed to a condition requiring the use of Tier 3 constriction equipment for the construction phase of the project.

9. Please indicate if any other mitigation measures or assumptions were used in CalEEMod to estimate construction emissions.

RESPONSE TO DATA REQUEST 9

The Applicant assumed the following basic mitigation measures for construction emissions:

- All exposed surfaces (soil piles, graded areas, and unpaved access roads) shall be watered at least two times per day.
- All haul trucks transporting material offsite shall be covered.
- All track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day.
- All vehicle speeds on onsite unpaved surfaces shall be limited to 5 miles per hour.
- All roadways, driveways, and sidewalks shall be paved as soon as possible. Building pads shall be completed as soon as possible after grading unless seeding or soil binders are used.
- Equipment idling times shall be minimized to 5 minutes per the Air Toxics Control Measure (ATCM). Idling time signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer specifications. All equipment shall be checked by a certified visible emissions evaluator.
- Information on who to contact, contact phone number, and how to initiate complaints about fugitive dust problems will be posted at the site.
- Use of low VOC coatings to comply with BAAQMD rules.

A number of these proposed mitigations are not specifically implemented in CalEEMod, which indicates that construction emissions are most likely conservative.

BACKGROUND: Vehicle Speed During Construction

Page 71 of the SPPE application (TN 232466) states that all vehicle speeds on onsite unpaved surfaces would be limited to 5 miles per hour (mph) as part of the mitigation PD AQ-1. However, the BAAQMD 2017 CEQA Guidelines only requires

speed limit of 15 mph. Staff would like to confirm whether the applicant agrees to the speed limit of 5 mph, instead of 15 mph.

DATA REQUEST

10. Please confirm the vehicle speed limit to be imposed on onsite unpaved surfaces.

RESPONSE TO DATA REQUEST 10

Considering the site size and layout, the construction period, and the level of activity expected on the site during construction, 5 mph represents a safe limit to reduce fugitive emissions and protect site workers and personnel. In addition and most importantly, **PD-AQ-1** was taken directly from the previous IS/MND adopted by the City of San Jose for the Approved Project. The Commission should be tiering off of that document pursuant to CEQA and should be evaluating the modifications proposed in the SPPE Application. All of the mitigation adopted by the City of San Jose for the Approved Project has been proposed as mitigation incorporated into the project. Section 2.4 of the SPPE Application has been revised to include all of the Approved Project mitigation measures as project design measures. See Attachment AQ DR-10.

BACKGROUND: Modeled Emission Rates Inconsistency

The application does not show how the modeled emission rates for PM2.5 and for health risks assessment were derived. Staff is not able to match the modeled emission rates with those shown in Table 4.5-6 (Summary of construction emissions) with the assumption of construction activities occurring 10 hours/day. Staff needs detailed calculations to show that the modeled emission rates match those provided in Table 4.5-6 for construction of the project.

In addition, for maintenance/readiness testing of the engines, the applicant also modeled project impacts assuming testing only occurs 10 hours/day. However, staff is not able to match the modeled emission rates with the annual emissions and the assumption of testing only occurring 10 hours/day in the health risks assessment for maintenance/readiness testing of the engines.

DATA REQUESTS

11. Please provide detailed calculations to show that the modeled emission rates for PM2.5 and health risks assessment match those provided in Table 4.5-6 for construction with the assumption of construction activities occurring 10 hours/day. If these are computed using a spreadsheet, please provide it.

RESPONSE TO DATA REQUEST 11

The modeled PM2.5 emission rate used in AERMOD for the HRA and the annual significance concentration(s) was based on the worst-case year of emissions in Table 4.5-6. The modeling limited the emissions to 10 hours per day by utilizing the HROFDY keyword in AERMOD which assigns scalars to each hour of the day, with a value of 1 having emissions and a value of 0 having no emissions. The hours were limited to between 7:00 AM and 5:00 PM, seven days a week. For the hours that are outside of the 7:00 AM and 5:00 PM window, the emissions are set to zero by AERMOD.

For the PM2.5 exhaust and fugitive emissions, the modeled emission rate was based on:

0.203 tpy exhaust emissions for the worst-case year 2021
0.1490 tpy fugitive dust for the worst-case year 2020
10 hours per day of construction activity = 3650 hours per year
39 point sources for combustion equipment activities
Fugitive dust area = 60,370.4 m^2

Combustion PM2.5
0.203 tpy *2000 lbs/ton * (1/3650 hrs) =0.111233 lb/hr
0.111233 lb/hr / 39 sources = 0.002852 lb/hr = **3.594E-04 g/s per source**

Fugitive PM2.5
0.1490 tpy * 2000 lbs/ton *(1 yr/3650 hrs) = 0.08164 lbs/hr
0.08164 lbs/hr = 0.010287 g/s / 60370.4 m^2 = **1.704E-07 g/s/m^2**

The emissions in Table 4.5-6 match the modeled emission rates used in AERMOD for the concentrations of PM2.5.

In HARP, AERMOD was run with the HROFDY keyword as above, but the emissions were normalized to 1 g/s for each of the 39 point sources (fugitive dust was not included in the modeling run for HARP. HARP requires annual emissions in pounds per year as input when modeling DPM risk and this was input as a Microsoft CSV file. The emissions of DPM were calculated as:

0.203 tpy exhaust emissions for the worst-case year 2021
39 point sources for combustion equipment activities

Combustion DPM
0.203 tpy *2000 lbs/ton /39 sources = 10.49 lb/year per source

12. Please provide detailed calculations to show the modeled emission rates for the health risks assessment for maintenance/readiness testing of the engines to match the annual emissions with the assumption of such testing only occur 10 hours/day. If these are computed using a spreadsheet, please provide it.

RESPONSE TO DATA REQUEST 12

As in Response 11, the HRA modeling limited the modeling to 10 hours per day by utilizing the HROFDY keyword in AERMOD. HARP requires plot file to be generated in AERMOD by using a normalized emission rate of 1 g/s. The CSV file input into HARP was based on the following diesel particulate matter emissions from Table 4.5-19 (Scenario 4) for each engine:

- QSK95 DPM Emissions = 22.46 lbs/year
- QSX15 DPM Emissions = 2.58 lbs/year

For the criteria pollutants, the annual impacts were calculated in a similar fashion to Data Response 11 for the modeled PM2.5 criteria pollutant impacts except the Scenario 2 emissions were used.

For example:

PM2.5 Annual for Maintenance Testing
10 hrs/day * 365 days/yr = 3650 hrs/yr
1.531 lbs/hr * 20 hours = 30.62 lbs/yr
30.62 lbs/yr / 3650 hours/yr * 0.126 = 1.057 g/s (0.126 converts lb/hr to g/s)

The same methodology was used for the annual NO_x, SO_2 and PM10 impact analyses.

13. Please revise the PM2.5 impacts analysis and health risks assessment for construction and maintenance and testing of the standby engines of the project if needed.

RESPONSE TO DATA REQUEST 13

No update is required.

BACKGROUND: Emission Factors

Starting from page 72, the SPPE application shows six scenarios to calculate standby engine emissions during maintenance and readiness testing and emergency operations. Scenarios 3 through 5 used EPA 40 CFR 89 D2 cycle weighted emission factors, which are lower than the Tier 2 emissions factors used for Scenarios 1 and 2. Table 4.5-23 on page 99 of the SPPE application compares annual emissions calculated based on Scenario 4 (with EPA 40 CFR 89 D2 cycle weighted emission factors) with BAAQMD significance thresholds. The applicant's proposed NOx offsets are also based on NOx emissions from Scenario 4 (with EPA 40 CFR 89 D2 cycle weighted emission factors).

The applicant estimated annual NOx emissions from Scenario 4 to be 16.3 tons per year (tpy), which is lower than the annual NOx emissions of 16.76 tpy from Scenario 2 using Tier 2 emission factors (shown in Table 4.5-8). Staff needs justification for using the lower EPA 40 CFR 89 D2 cycle weighted emission factors as basis for offsetting the project's NOx emissions, rather than using higher Tier 2 emission factors.

DATA REQUESTS

14. Please provide reference and detailed calculations to show how the EPA 40 CFR 89 D2 cycle weighted emission factors were derived.

RESPONSE TO DATA REQUEST 14

The EPA engine family D2 Cycle emissions certifications are presented in Appendix A, Section AQ2, at page 14 for the QSK95 engine, and at page 35 for the QSX15 engine. The D2 cycle emissions values were derived from tests conducted pursuant to 40 CFR 89.404 and 40 CFR Appendix B to Subpart E of Part 89 (Table 2: 5-Mode Test Cycle for Constant-Speed Engines).

15. Please provide justification for using the lower EPA 40 CFR 89 D2 cycle weighted emission factors as basis for offsetting the project's NOx emissions, rather than using higher Tier 2 emission factors.

RESPONSE TO DATA REQUEST 15

The use of the D2 cycle emissions factors is consistent with the BAAQMD permitting procedures per the Engineering Division-Permit Handbook. Note that the criteria pollutant modeling analyses utilized Scenario 2, which are the emissions based on the Tier 2 limits.

BACKGROUND: Diesel Particulate Filters

Page 98 of the SPPE application shows that the standby engines would be EPA certified Tier 2 units equipped with diesel particulate filters (DPFs). However, the SPPE application does not show the make or model or control efficiency of the DPFs. Staff needs such information to complete the initial study.

DATA REQUEST

16. Please provide make and model of the DPFs.

RESPONSE TO DATA REQUEST 16

The information on page 98 is an oversight text error. The backup emergency engines as proposed will **not** be equipped with DPF's.

17. Please provide control efficiency of the DPFs and explain whether the control efficiency would change during intermittent maintenance and testing of the standby engines.

RESPONSE TO DATA REQUEST 17

See Response to Data Request 16.

BACKGROUND: Testing and Maintenance Frequencies and Loading

Page 18 of the SPPE application states that Section 4.5 provides a complete description of the testing and maintenance frequencies and loading proposed for the GOSBGF. However, staff is not able to find such description. Staff needs a detailed description of the testing and maintenance frequencies and standby engine load points to verify assumptions used in the SPPE analysis.

DATA REQUEST

18. Please provide a detailed description of the testing and maintenance frequencies and standby engine load points for the Cummins QSK95-G9 and Cummins QSX15-G9 engines. For example, the description could include the length and engine load points for each weekly, monthly, quarterly, and annual testing and maintenance events.

RESPONSE TO DATA REQUEST 18

Based on the current proposed maintenance and readiness testing period of only 20 hours per year per engine, the Applicant is not proposing a set schedule as noted above. The Applicant notes that the emissions scenarios as presented cover the maximum emissions for the basic run scenarios, and the engines will not run outside of these bounding scenarios.

However, Equinix has requested more information from its Site Operations Team and will provide additional information under separate cover.

BACKGROUND: Testing and Maintenance Limits

The annual emissions and impacts analysis in the SPPE application is based on the assumption of 20 hours per year of testing and maintenance. The daily emissions and impacts analysis is based on the assumption of testing 6 larger QSK95 engines or 3 smaller QSX15 per day. It is also assumed that the engines would be tested only during 7 AM to 5 PM in the impacts analysis. In addition, the short-term impacts analysis assumes only one engine will be tested at any one time during a single hour. Staff would like to verify that these assumptions would be made enforceable.

DATA REQUESTS

19. Please confirm that the applicant would request the district to require an enforceable limit that would allow no more than 20 hours per year per engine for readiness and maintenance testing.

RESPONSE TO DATA REQUEST 19

Since each of the parameters noted in Requests 19 through 22 are an integral part of the SPPE application, and emissions and impacts are based on these assumptions, and since these same assumptions will be presented in the District application (which is the same document as the SPPE application), we believe that the District will incorporate these assumptions and limitations into the District ATC and PTO. Notwithstanding the above, the Applicant will confirm with District staff that each of these parameters be listed as a permit condition.

20. Please confirm that the applicant would request the district to require an enforceable limit that would allow testing of no more than 6 larger QSK95 engines or 3 smaller QSX15 per day.

RESPONSE TO DATA REQUEST 20

See Response to Data Request 19.

21. Please confirm that the applicant would request the district to require an enforceable limit that would allow testing of engines only between 7 AM to 5 PM daily.

RESPONSE TO DATA REQUEST 21

See Response to Data Request 19.

22. Please confirm that the applicant would request the district to require an enforceable limit on concurrent testing of engines so that only a single engine operates for maintenance and testing at any given time.

RESPONSE TO DATA REQUEST 22

See Response to Data Request 19.

BACKGROUND: VOC Emissions for the Diesel Storage Tanks

Table 4.5-23 on page 99 of the SPPE application shows VOC emissions from diesel storage tanks would be less than 0.1 tpy. However, the application does not provide detailed calculations for the VOC emissions from diesel storage tanks. It is also unknown whether the VOC emissions shown in Table 4.5-23 include those from the diesel storage tanks or during transfer of diesel into the tanks. The application does not mention whether there would be any devices installed to control the VOC emissions from the tanks or during transfer of diesel into the tanks. The application does not provide the diesel refueling frequencies. Staff needs such information to verify the VOC emissions provided in Table 4.5-23.

DATA REQUESTS

23. Please clarify whether there would be any devices installed to control the VOC emissions from the diesel storage tanks and during transfer of diesel into the tanks. If yes, please provide any references to any air agency diesel fuel VOC control requirements and the control efficiency of the devices to be installed.

RESPONSE TO DATA REQUEST 23

As background, please note the following: (1) BAAQMD Regulation 2 Rule 1, Section 123 exempts from permitting the following in subsection 3.5, fuel oils with API gravities less than or equal to 40 in tanks with capacities less than 10,000 gallons, (2) the tank capacities proposed for the large QSK95 engines are 9,200 gallons each, and the capacities for the QSK15 engines are well below this value, therefore, the #2 diesel fuel tanks are exempt from permit, (3) California diesel fuel regulations found in Title 13 CCR, Sections 2281-2285 indicate that such fuels are required to have API gravities below 40, and (4) the typical true vapor pressure of #2 diesel fuel ranges from 0.0074 to 0.0090 psia at temperatures ranging from 60 to 70 degrees F. Based on the foregoing, no VOC controls are required or proposed for these engine fuel tanks.

The large QSK95 engines will consume approximately 4,440 gallons of fuel per year for purposes of maintenance and readiness testing, while the QSK15 engines will consume about 680 gallons per year. The re-fueling frequency is discussed in Responses to Data Requests 50 and 51.

The diesel fuel tanks for the proposed engines are essentially fixed roof tanks that are situated below the engine's support base, inside of the engine housing. The attached VOC emissions calculations, based on the fixed roof equations in AP-42 section 7.1, indicate that VOC emissions are well below the estimated value of 0.1 tpy, i.e., 0.021 tpy. These calculations include both working and breathing loss emissions.

24. Please provide the diesel refueling frequencies.

RESPONSE TO DATA REQUEST 24

See Responses to Data Requests 50 and 51.

25. Please provide detailed calculations with assumptions used to estimate the VOC emissions from the diesel storage tanks and during transfer of diesel into the tanks.

RESPONSE TO DATA REQUEST 25

See Response to Data Request 23.

BACKGROUND: Cumulative Health Risk Impacts

The BAAQMD CEQA Guidelines for assessing cumulative health risk impacts recommend all sources of toxic air contaminants (TACs) within 1,000 feet of a proposed project to be evaluated. The SPPE application only analyzed the health risks of the project itself. Staff needs the cumulative health risks evaluation to complete the initial study.

DATA REQUEST

26. Please provide a cumulative TAC health risks analysis to include all sources of TACs within 1,000 feet of the proposed project.

RESPONSE TO DATA REQUEST 26

The BAAQMD cumulative TAC health assessment requirements, as per the BAAQMD

CEQA Guidelines, only analyze sources within 1,000 feet of the project boundary. Table 26-1 presents the list of sources within 1,000 feet of the project boundary and includes values for PM2.5.

Table 26-1 Stationary Source Risk Values (BAAQMD)					
Source ID		**Source Type**	**Cancer Risk (10^{-6})**	**Hazard Index**	**PM2.5**
3102	Pacific Gas and Electric Company	Contact BAAQMD	8.22	0.02	0.01
16518	Northrop Grumman Systems Corp	Generators	10.09	0.02	0.01
18254	ISCS, Inc	Generators	0.63	0	0
21025	Monolithic Power Systems, Inc	Contact BAAQMD	1.42	0	0
23743	G&I VII Westcore Santa Teresa & Great Oaks, LP	Generators	59.8	0.09	0.04
108526	Oak Grove School District	Gas Dispensing Facility	0.06	0	0
		Sum	**80.22**	**0.13**	**0.06**
* Initial risk of 24.49 was refined using the BAAQMD distance tool, based on the source location approximately at 500 feet from the project site.					

Cumulative stationary impacts were assessed for the worst case receptor location. As recommended by the BAAQMD (BAAQMD, 2020), to assist in evaluating cumulative risks, permitted stationary sources of TACs near the project site were identified using BAAQMD's Stationary Source Risk and Hazard Analysis Mapping Tool for sources near the proposed project. This mapping tool uses Google Earth to identify the location of stationary sources and their estimated screening level cancer risk and hazard impacts. No major roadways or highways were within 1,000 feet of the project boundary, so only stationary sources were included. The cumulative results are presented in Table 26-2 and are all below the BAAQMD cumulative significance thresholds.

Table 26-2 Stationary Source Risk Values (BAAQMD)					
Source ID	**Source Name**	**Source Type**	**Cancer Risk (10^{-6})**	**Hazard Index**	**PM2.5**
3102	Pacific Gas and Electric Company	Contact BAAQMD	8.22	0.02	0.01
16518	Northrop Grumman Systems Corp	Generators	10.09	0.02	0.01
18254	ISCS, Inc	Generators	0.63	0	0
21025	Monolithic Power Systems, Inc	Contact BAAQMD	1.42	0	0
23743	G&I VII Westcore Santa Teresa & Great Oaks, LP	Generators	59.8	0.09	0.04
108526	Oak Grove School District	Gas Dispensing Facility	0.06	0	0
Great Oaks South Project	GOSBGF	Data Center	9.56	0.0074	0.62
		Sum	**89.78**	**0.137**	**0.68**

BACKGROUND: Cumulative Criteria Pollutants Impacts

The application does not include a complete cumulative air quality modeling analysis for criteria pollutants. The cumulative analysis should include all reasonably foreseeable new projects with a potential to emit of 5 tons per year or more of criteria pollutants and located within a 6-mile radius of the proposed project. This includes all projects that have received construction permits but are not yet operational and those that are either in the permitting process or can be expected to be in permitting in the near future.

A complete criteria pollutant cumulative impacts analysis should identify all existing and planned stationary sources that affect the baseline conditions and consider them in the modeling effort. Staff needs a cumulative modeling analysis, or additional justification why an air quality cumulative modeling analysis is not

needed for this project, to complete the staff analysis for cumulative air quality impacts.

DATA REQUESTS

27. Please justify why cumulative impact analysis for criteria pollutants was not done for the proposed project.

RESPONSE TO DATA REQUEST 27

Data Requests 27 through 30 continue to provide confusion relating to Staff's Cumulative Impact CEQA approach to criteria pollutants. For several prior SPPE Applications, Staff has requested the information and cumulative impact modeling analysis contained in these data requests. Applicants have consistently answered that the BAAQMD will not provide the data necessary to perform the modeling analysis discussed in these data request.

This is confusing, since Staff has consistently applied the BAAQMD guidelines as the appropriate CEQA significant thresholds and conducted its cumulative impact analysis for all IS/MNDs issued for prior data centers in the BAAQMD accordingly. The Commission's Final Decision in the McLaren Data Center and Laurelwood Data Center affirmed this approach. That is the approach employed by SV1 at pages 98-99 of its SPPE Application and summarized in Table 4.5-23. Therefore, SV1 did an appropriate, defensible CEQA analysis of cumulative air quality impacts and the modeling identified above is not necessary, nor feasible. SV1 requests that it withdraw Data Requests 27 through 30 in order to remove any confusion in the record and acknowledge that SV1 did complete a CEQA Cumulative Air Quality Impact Analysis. Such confusion could lead to unnecessary motions to compel by intervenors.

28. Please provide a list from the district of existing and planned cumulative sources located within 6 miles of the project site.

RESPONSE TO DATA REQUEST 28

See Response to Data Request 27.

29. Please provide the list of sources to be considered in the cumulative air quality impact analysis.

RESPONSE TO DATA REQUEST 29

See Response to Data Request 27.

30. Please provide the cumulative impact modeling analysis, including the proposed project and other identified new and planned projects within 6 miles of the proposed project site.

RESPONSE TO DATA REQUEST 30

See Response to Data Request 27.

BACKGROUND: Electrical System Outages

The SPPE application does not provide reliability or outage frequency of the PG&E system in the vicinity of the project area. To explore the potential nature of emergency operations of the standby engines, staff needs to confirm and refine our understanding of PG&E's electrical system outages.

DATA REQUEST

31. Please provide information that reviews the frequency and durations of historic outages of the Metcalf - Edenvale 115 kilovolt (kV) line and related 230kV facilities that would be likely to trigger a total loss of service to the proposed project and lead to emergency operations of the diesel-powered generators. This response should identify the reliability of service historically provided by PG&E to other similar data centers in its service territory.

RESPONSE TO DATA REQUEST 31

SV1 discussed this data request with Jennifer Goncalves, PG&E representative for the Great Oaks South Data Center. Ms. Goncalves conducted research within PG&E and reported that the local transmission lines expecting to interconnect the proposed Santa Teresa Distribution substation Metcalf – Edenvale #1 115 kV line and Metcalf – Edenvale #2 115 kV line have experienced no sustained electric outages during the past 5 years.

BIOLOGICAL RESOURCES

BACKGROUND: Mitigation Monitoring and Reporting Plan and Supporting Technical Studies

Section 1.2 Prior Environmental Review of the SPPE application (TN 232466) states that a copy of the Mitigation Monitoring and Reporting Plan and supporting technical studies are located in Appendix K (TN 232467-3). However, these documents are not present in Appendix K or elsewhere in the SPPE application.

DATA REQUESTS

32. Please provide a copy of the Mitigation Monitoring and Reporting Plan that was approved by the City of San Jose.

RESPONSE TO DATA REQUEST 32

Please see Attachment BIO DR-32.

33. Please provide a copy of the supporting technical studies.

RESPONSE TO DATA REQUEST 33

Please See Attachment BIO DR-33.

BACKGROUND: Biological Resources Report and Surveys

Section 4.6 Biological Resources mentions that a copy of the Biological Resources Report by H.T. Harvey and Associates (November 2015) is located in Appendix B (TN 232467-1). However, this document is not present in Appendix B. In addition, the SPPE application does not mention or provide any recent documentation of biological resources surveys conducted within the past year for the proposed project. Staff needs more recent biological resources surveys to assess the current condition of the proposed project site.

DATA REQUESTS

34. Please provide a copy of the Biological Resources Report by H.T. Harvey and Associates (November 2015).

RESPONSE TO DATA REQUEST 34

Please See Attachment BIO DR-34.

35. Please conduct a biological resources reconnaissance survey and provide an updated report documenting current site conditions.

RESPONSE TO DATA REQUEST 35

An updated report is not needed due the lack of sensitive habitat on the site and the fact that the site has remained unchanged (with the exception of tree removal) since the previous biological report was prepared.

Prior to construction a pre-construction survey shall be required for nesting birds depending on the timing of construction in relation to the nesting bird season (January and September). See Attachment AIR DR-10 for an updated Section 2.4 of the Project Description which now includes all mitigation measures adopted by the City of San Jose in the prior IS/MND for the Approved Project as Project Design Measures for the GOSBGF and GOSDC.

The updated existing conditions of the trees are documented on the Tree Removal Plan updated Figure 2.2-3 in Attachment BIO DR-37.

BACKGROUND: Tree Survey Report

A Tree Survey Report by H.T. Harvey and Associates (November 2015) was provided in Appendix B of the SPPE application. A Tree Protection Plan provided in Appendix D (TN 232467-1) contains a report that includes an assessment of trees located on the west side of the project site and includes tree mitigation and tree preservation guidelines from a certified arborist. However, this report was prepared in September 2018 and does not document the current site conditions. In addition, Figure 2.3-3 (Tree Removal Plan, page 34) of the SPPE application shows trees not mentioned in the Tree Survey Report or Tree Protection Plan. Staff needs current and consistent information in order to determine which trees are currently present on site, and which will be removed, if any.

DATA REQUEST

36. Please provide an updated report prepared by a Certified Arborist that documents current site conditions and identifies all trees to be preserved and removed.

<u>RESPONSE TO DATA REQUEST 36</u>

The updated arborist report is included in Attachment BIO DR-36.

BACKGROUND: Tree Removal

Figure 2.3-3 (Tree Removal Plan, page 34) shows several trees that will be removed. Trees marked 15 and 19 are located approximately where tree X is located on the Tree Assessment Map (located at the end of Appendix D). Section 2.3.2.5 (Landscaping) (TN 232466) states that an amendment to the special use permit issued by the City of San Jose will include an additional six trees to be removed (one on-site and five off-site) beyond the 13 already removed, and Section 4.6 Biological Resources (TN 232466, page 105) states no additional tree removal beyond the 13 trees already removed would occur. These two sections provide conflicting information. Section 3.7 Project- Related Approval, Agreement, and Permits of the SPPE application lists a Tree Removal Permit as one of the City of San Jose approvals, however this permit is not included in the application.

DATA REQUESTS

37. Does Figure 2.3-3 reflect the most up to date and current conditions for the proposed project including tree removal? If not, please provide a revised figure.

<u>RESPONSE TO DATA REQUEST 37</u>

Please see Revised Figure 2.3-3 in Attachment BIO DR-37.

38. Please explain the discrepancy between Section 2.3.2.5 (Landscaping) and Appendix D.

RESPONSE TO DATA REQUEST 38

The comment is correct; there were errors in the discussion of trees. The Figure 2.3-3 has been revised to document the correct number of trees currently on and adjacent to the site as well as the trees to be removed and retained. Please See Attachment BIO DR-37.

39. Please provide a copy of the Tree Removal Permit, if available.

RESPONSE TO DATA REQUEST 39

Removal of previously existing on-site trees was pursuant to the City of San Jose Special Use Permit and not a separate tree removal permit. Please see Attachment BIO DR-39. Item 1, under Facts on page 1 of the Special Use Permit provides the tree removal authorization.

BACKGROUND: Approved and Submitted Documents and Fees

Page 103 of the SPPE application states "a Habitat Plan application was completed and submitted to the City, and all fees were paid prior to issuance of grading permits". Page 108 of the SPPE application (TN 232466) mentions land cover and nitrogen deposition fees paid in 2018 prior to obtaining the grading permit. Staff needs to review these documents as part of the CEQA review process and per the requirements of the Santa Clara Valley Habitat Plan (SCVHP). These documents provide a timeline of what documents and mitigation has been provided, approved, or completed.

DATA REQUESTS

40. Please provide a copy of the Habitat Plan application submitted to the City of San Jose.

RESPONSE TO DATA REQUEST 40

Please See Attachment BIO DR-40.

41. Please provide a copy of the document that shows what fees are required by the City of San Jose and the SCVHP.

RESPONSE TO DATA REQUEST 41

Please See Attachment BIO DR-41.

42. Please provide copies showing proof that land cover and nitrogen deposition fees were paid.

RESPONSE TO DATA REQUEST 42

Please See Attachment BIO DR-42.

BACKGROUND: Agency Communication and Contacts

Section 7.0 of the SPPE application provides contact information for the City of San Jose Department of Planning, Building and Code Enforcement. However, there is no mention or documentation of contacting federal or state wildlife agencies.

DATA REQUEST

43. Please provide documentation and contact information for any federal, state, or local agency communications regarding biological resources for this proposed project.

RESPONSE TO DATA REQUEST 43

Since the project site was approved by the City of San Jose for the original project and all HCP fees were paid, and no new additional property will be disturbed by the modifications proposed in the SPPE Application, there have been no new communications with any federal or state communications regarding biological resources for the modifications. A planning application for the modifications was submitted to the City of San Jose shortly after submission of the Application for SPPE.

CULTURAL/TRIBAL CULTURAL RESOURCES

BACKGROUND

Assessment of potential impacts on cultural and tribal cultural resources hinges in part on knowing the extent and character of ground-disturbing activities associated with a project. This includes the ingress and egress required during construction, especially of vacant, ungraded properties.

DATA REQUESTS

44. Describe construction access points, including the street(s) from which construction personnel and equipment would access the subject property. Please include the estimated depth and horizontal extent of excavation to create construction ingress/egress. Also show ingress and egress on a map similar to Figure 2.2-1 in the application.

RESPONSE TO DATA REQUEST 44

Please See Attachment CUL DR-44, which shows estimated locations of likely construction access points for each phase of construction. The estimated depth of excavation for construction ingress/egress is 12 inches.

45. Figure 2.3-5 of the application depicts an underground storm water detention basin beneath the proposed parking lot. How deep would excavation proceed in order to install the underground storm water detention basin? Please provide the depth with reference to the current grade/ground surface.

RESPONSE TO DATA REQUEST 45

The depth of excavation for the installation of the underground storm water detention basin is approximately 14.5 feet below existing ground.

BACKGROUND

The application states that five new, 21-kV distribution feeders would extend from the Santa Teresa Substation along Via Del Oro to the project site (DJP&A 2020, pages 19, 31). The previous (2017) initial study/mitigated negative declaration

(IS/MND) analyzed two such distribution feeders, both planned as underground utilities (DJP&A 2020, Appendix K). It is unclear whether the current proposal of five distribution feeders would be underground or aboveground utilities. Neither the application nor the previous IS/MND identify the depth or width of excavation required to install distribution feeders in either a two-feeder or five-feeder configuration. Finally, the distribution feeders' route is not shown on a map.

DATA REQUESTS

46. Please identify whether the five new distribution lines would be installed underground, aboveground, or some combination of both.

<u>RESPONSE TO DATA REQUEST 46</u>

There will be five new distribution lines all installed underground. PG&E provided the preferred routes in Attachment CUL DR-46.

47. Describe the number of trenches, if applicable, proposed for installation of the distribution lines, as well as the length, width, and depth of excavation.

<u>RESPONSE TO DATA REQUEST 47</u>

Two distribution lines will be located in a single trench. PG&E requires six feet of separation between trenches. The initial power requirements will be met with one trench from Santa Teresa Substation to the site containing two distribution lines. The remaining three distribution lines will be constructed as needed and will require two additional trenches. According to PG&E practices, a typical trench for the distribution lines would be 3 to 5 feet deep and approximately 18 to 30 inches wide.

48. Map the route of the proposed distribution lines on a scaled figure.

<u>RESPONSE TO DATA REQUEST 48</u>

See Response to Data Request 46 and Attachment CUL DR-46.

BACKGROUND

The SPPE application states on page 109: "The following discussion is based in part on [a] Cultural Resources Assessment completed by Albion Environmental, Inc., in October, 2018. A copy of the report will be submitted separately under Request for Confidential Designation". This report was submitted to CEC on April 13, 2020. The supporting documentation has not been provided to the CEC cultural resources staff. Independent analysis of the project cannot proceed without this vital information, as none of the contextual background information is included in the 2020 SPPE or the 2017 MND.

DATA REQUEST

49. Please provide copies of the reports and records of the literature search conducted for the Cultural Resources Assessment (Albion 2018, Appendix A: NWIC File No. 18-0257). Please ensure that the results include the 0.25 mile search area radius indicated on maps as provided by the Northwest Information Center (NWIC) or prepared by the consultant using shape files provided by the NWIC.

RESPONSE TO DATA REQUEST 49

SV1 has requested that the cultural resources consultant Albion, obtain the information responsive to this request. The documents will be docketed pursuant to a Request For Confidentiality when received.

HAZARDS AND HAZARDOUS MATERIALS

BACKGROUND: Fuel Tank Replenishment Strategies

The project consists of a single emergency generator package configuration. Each backup generator is fully independent of the others and would have its own dedicated fuel tank located on a skid beneath the generator. Each diesel engine would be readiness tested on a regular schedule, consuming only a small portion of its fuel each time.

DATA REQUEST

50. Please provide the fuel tank replenishment strategy and frequency, and the estimated frequency of fuel trucks needing to visit the facility for refueling.

RESPONSE TO DATA REQUEST 50

SV1 estimates that fuel consumed during routine maintenance and testing of the generators would be replaced biannually and would take approximately 10 fuel truck trips for each replacement event.

BACKGROUND: Diesel Fuel Degradation Precautions

Stored diesel fuel is subject to degradation over time, which can render it unsuitable for use and potentially requiring it to be changed-out for fresh fuel.

DATA REQUEST

51. Please describe what measures are planned to maintain adequate quality of the stored fuel. Is the generator equipped with a fuel filtration system? How often might the stored fuel need to be changed out for new? If needed, how would this be accomplished? How many fuel truck visits would be required for the change out?

RESPONSE TO DATA REQUEST 51

Each generator would have redundant fuel filters but no on-site fuel polisher will be installed. SV1 will contract to have the fuel polished by an outside contractor annually.

UTILITIES AND SERVICE SYSTEMS

BACKGROUND: Water Supply Assessment

Sections 10910 et seq. of the California Water Code set forth the circumstances in which CEQA lead agencies must seek preparation of, or prepare themselves, water supply assessments (WSAs) for certain types of proposed projects. A fundamental task of a WSA is to determine whether total projected water supplies available during normal, single-dry, and multiple-dry water years will meet the projected water demand associated with a proposed project, in addition to the water supplier's existing and planned future uses. When making such a determination, the authors of the WSA must address several factors including information regarding existing water supplies, projected water demand, and dry year supply and demand. Suppliers are expressly permitted to rely on information contained in the most recently adopted Urban Water Management Plans (UWMPs), so long as the water needed for the proposed project was accounted for therein.

A WSA is required for staff to complete its analysis of the SPPE. The applicant did not submit a WSA along with the SPPE application. It should be noted that a WSA is not the same as the Water Supply Questionnaire that the applicant provided in Appendix I of the SPPE application.

DATA REQUESTS

52. Please provide a WSA that includes the components described above, particularly availability of water supplies for the purveyor to meet the project's demand in normal, dry, and multi-dry years.

RESPONSE TO DATA REQUEST 52

Please See Attachment UTIL-52.

53. In case of a shortage in any projected year, provide information on the water purveyor's plans to make up for those shortages.

RESPONSE TO DATA REQUEST 53

Please See Attachment UTIL-52.

BACKGROUND: Recycled Water

The policy of the state as well as the Energy Commission is to use potable water for the highest-value uses, such as drinking and other human sanitary uses. For other uses, such as industrial processes, lower quality waters such as brackish and recycled wastewater are highly encouraged. The proposed use of up to 1,000 AFY of potable water for cooling purposes could be considered unreasonable and wasteful. What makes it even more unreasonable is that potable water is proposed even when recycled water from the South Bay Water Recycling Program (SBWRP) is available in the project area. The reason stated by the applicant for not planning to use recycled water is the local water supplier, Great Oaks Water Company (GOWC), is not a member of the SBWRP, and that GOWC has no plans for joining the SBWRP to have access to recycled water. Even if recycled water were proposed, 1,000 AFY could still be considered unreasonable for this project in comparison with other comparable projects that use much less water. Staff would like to know if the applicant has pursued other options to get recycled water, and also other available cooling technologies that use less water.

DATA REQUESTS

54. Provide detailed explanation why the prospective water supplier will not join SBWRP to be able to get recycled water for the project

RESPONSE TO DATA REQUEST 54

GOWC informed SV1 that it cannot join the SBWRP because it is not a public agency. It could purchase the recycled water wholesale and provide it to the project at retail prices after adoption of a tariff. GOWC does not currently have infrastructure necessary to deliver recycled water within its service territory.

55. Provide information on pursuing other options to get recycled water for project use.

RESPONSE TO DATA REQUEST 55

South Bay Water Recycling (SBWR) is the regional permit holder for recycled water in the cities of San Jose, Santa Clara and Milpitas. SBWR wholesales the recycled water to San Jose Water Company, the City of Santa Clara and the City of Milpitas. For the southern portion of San Jose, SBWR has a contract with Valley Water, for which Valley

Water is the wholesaler.

At this time Valley Water has identified priorities for their allotment of recycled water, which does not include new customers such as Equinix.

SBWR and Valley Water are in the process of doing a study for countywide usage of recycled water usage which won't be completed until sometime in mid-2021, and so would be unable to determine if Equinix could be served and at what volume. Also, Valley Water's contract with SBWR will sunset in 2027. Renewal of this contract would need to be approved by both SBWR and Valley Water's Board of Directors.

Equinix had a meeting with SBWR and Valley Water, both of which indicated that their respective boards would need to consider whether there would be recycled water available to serve any of the phases of the GOSDC. SBWR and GOSDC both agreed that even the initial decision on whether the recycled water currently allocated to Valley Water could be available to serve the GOSDC was unlikely to be made in 2020, with the possibility that it would not be made until near the expiration of the Valley Water contract with SBWR in 2027. Therefore, recycled water is not available at this time to support the development timeline of the GOSDC.

56. Provide detailed explanation why other, less water intensive, cooling technologies have not been considered.

<u>RESPONSE TO DATA REQUEST 56</u>

The Project design team is preparing a detailed response to this request which will be provided under separate cover.

TRANSMISSION

BACKGROUND

Section 2.3 of the SPPE application indicates that the data center would be supported from the new PG&E Santa Teresa Substation. Staff requires a complete description of the both the GOSDC interconnection to the PG&E transmission grid and the reliability of the PG&E grid in order to understand the potential operation of the back-up generators.

DATA REQUESTS

57. Please provide a complete one-line diagram for the new PG&E Santa Teresa Substation. Show all equipment ratings including bay arrangement of the breakers, disconnect switches, buses, redundant transformers or equipment, etc. that would be required for interconnection of the GOSDC.

RESPONSE TO DATA REQUEST 57

SV1 requested the information contained in this data request from PG&E. PG&E provided the site plan for the Santa Teresa Substation, which was already evaluated by the City of San Jose as part of the approved project, and was approved for construction by the California Public Utilities Commission and is currently under construction. The information in this data request is simply not necessary for the Commission to complete its CEQA analysis of the modifications to the approved project as no modifications to the Santa Teresa Substation are proposed in the SPPE Application. However, Attachment TSE DR-57 includes the site plan for the Santa Teresa Substation provided by PG&E.

58. Please provide a detailed description and a one-line diagram showing how the GOSDC would be connected to the Santa Teresa Substation. Please label the name and voltage of the lines and feeders that connect to the substation and the GOSDC.

RESPONSE TO DATA REQUEST 58

A diagram responsive to this request will be submitted under separate cover on or before May 22, 2020.

59. Please provide the conductor name, type, current carrying capacity, and conductor size for the transmission lines and 21 kV line that would be required for interconnecting the GOSDC and the Santa Teresa Substation.

RESPONSE TO DATA REQUEST 59

All feeders will be 21 kV (20,780 volts), completely underground, and would utilize 1100AL EPRC cable. The ampacity for each feeder's cable would be 615A, though each feeder's capability would likely be limited to 600A by the capacity of underground switches.

60. Please provide the 21 kV supply line route, length and supporting structure configurations and measurements.

RESPONSE TO DATA REQUEST 60

See Response to Data Request 46 and Attachment CUL DR-46.

61. Please describe whether a loss of the 115 kV line on either side of the Metcalf or Edenvale Substation could cause a loss of service to the proposed data center.

RESPONSE TO DATA REQUEST 61

According to PG&E, the project would not be affected by a loss of the 115 kV line on either side of Metcalf or Edenvale Substation as the project will be served entirely by the Santa Teresa Substation because the system is looped. The Santa Teresa Substation was designed and is under construction to increase the reliability of service to the GOS Data Center.

62. Please describe whether the proposed data center load could be fully supplied through either the proposed Metcalf - Santa Teresa 115 kV or from the proposed Edenvale – Santa Teresa 115 kV line.

RESPONSE TO DATA REQUEST 62

The GOS Data Center will be fed from the new Santa Teresa Substation. However in the future, reconductoring or a line re-rate for 115KV lines supplying the Santa Teresa Substaton (Please see response to 31) may be required for each to meet the full demand of the site independently.

TRANSPORTATION

BACKGROUND: Calculation of Project Vehicle Miles Travelled (VMT) Using the San Jose VMT Evaluation Tool

In accordance with Senate Bill 743, San Jose City Council Policy 5-1 requires proposed projects to use the city's online VMT Evaluation Tool to estimate project VMT. The VMT estimate is generated using project specific information such as accessors parcel number, building square footage by use (e.g., industrial, office), and automobile and bicycle parking spaces. If the project's estimated VMT exceeds the city's industrial or office VMT threshold then a combination of Tier 1 (project characteristics), Tier 2 (multimodal network improvements), and Tier 3 (parking) VMT reduction strategies should be applied to reduce VMT below the established threshold. If the estimated project VMT still exceeds the City of San Jose's established VMT threshold following the application of Tier 1, 2, and 3 VMT reduction strategies then Tier 4 transportation demand management (TDM) programs should be applied to reduce the project's VMT below the threshold or to the greatest extent possible. Some of these VMT reduction strategies require coordination and/or negotiations with the City of San Jose and others for implementation (San Jose 2018a).

DATA REQUESTS

63. In consultation with the City of San Jose, please submit a Transportation analysis utilizing a VMT calculation methodology that is consistent with city policy.

RESPONSE TO DATA REQUEST 63

Please See Attachment TRANS DR-63 which includes an April 7, 2020 email from Tiffany Pong/CSJ Public Works confirming that VMT is not required because project was previously approved with no traffic impact and this Permit Amendment reduces the size of the building.

64. If necessary following consultation with the City of San Jose, please identify and submit project design modifications and/or TDM measures that would reduce project VMT per employee below all applicable significance thresholds or to the maximum extent possible.

RESPONSE TO DATA REQUEST 64

See Response to Data Request 63.

ATTACHMENT AQ DR-10

Revised SPPE Application Section 2.4

2.4 MITIGATION INCORPORATED INTO PROJECT DESIGN

2.4.1 Air Quality

PD AQ-1: To ensure that fugitive dust impacts are less than significant, the project will implement the BAAQMD's recommended BMPs during the construction phase. These BMPs are incorporated into the design of the project and will include:

- All exposed surfaces (soil piles, graded areas, and unpaved access roads) shall be watered at least two times per day.
- All haul trucks transporting material offsite shall be covered.
- All track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day.
- All vehicle speeds on onsite unpaved surfaces shall be limited to 5 miles per hour.
- All roadways, driveways, and sidewalks shall be paved as soon as possible. Building pads shall be completed as soon as possible after grading unless seeding or soil binders are used.
- Equipment idling times shall be minimized to 5 minutes per the Air Toxics Control Measure (ATCM). Idling time signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer specifications. All equipment shall be checked by a certified visible emissions evaluator.
- Information on who to contact, contact phone number, and how to initiate complaints about fugitive dust problems will be posted at the site.

PD AQ-2: Generator operation for maintenance and testing purposes shall be limited so that the combined operation of all 21 generators does not exceed 356 hours in any consecutive 12-month period:

- The maximum number of hours of operation of the generators for maintenance and testing is regulated by the Bay Area Air Quality Management District (BAAQMD), which will issue individual Permits to Operate for each data center building (or groups of generators) as they are constructed. The conditions in each Permit to Operate will be enforceable by BAAQMD. Prior to issuance of an occupancy permit for each building, the applicant shall provide a letter to the Director of Building, Planning and Code Enforcement from BAAQMD and/or a qualified consultant that documents that the sum of the hours of operation permitted and regulated by BAAQMD for the three data centers combined does not exceed 356 hours in any consecutive 12-month period. This letter shall include a copy of the BAAQMD approved Permit to Operate.
- If, subsequent to issuance of occupancy permits, there is a change to the number of generators, a change to the model of generators, or a change in the number of hours the generators will be tested, documentation shall be provided to the City of San José

Department of Building, Planning and Code Enforcement that total emissions from maintenance and testing for the three data centers would not exceed the significance thresholds for Nitrogen Oxide (NOx) on both an average daily (54 pounds per day) and annual averaging (10 tons/year) period. This documentation shall be reviewed and approved by a Supervising Planner of the Environmental Review Division of the Department of Planning, Building, and Code Enforcement prior to the issuance of any Planning Permits approving changes to the generators.

2.4.2 Biological Resources

PD BIO-1: In accordance with current City policies and Municipal regulations, trees removed will be replaced at the ratios identified in Table 4.6-1.

- In the event replacement/mitigation trees cannot be accommodated on the site, tree removal shall be mitigated through a donation of $300 per mitigation tree to Our City Forest for in-lieu off-site tree planting in the community. The species of trees to be planted shall be determined in consultation with the City Arborist and the Department of Planning, Building and Code Enforcement. Trees removed shall be replaced at these ratios, or the applicant shall pay an in-lieu fee to Our City Forest to compensate for the loss of trees on-site.

PD BIO-2: In accordance with guidelines established by the International Society for Arboriculture, the following tree protection measures will be implemented to reduce impacts to the Heritage Tree:

- Establish an area surrounding the Heritage Tree to be protected during construction as defined by a circle concentric with each tree with a radius 1-1/2 times the diameter of the tree canopy drip line. This "tree protection zone" is established to protect the tree trunk, canopy and root system from damage during construction activities and to ensure the long-term survival of the protected trees. The tree protection zone shall: (1) ensure that no structures or buildings, that might restrict sunlight relative to the existing conditions, will be constructed in close proximity to the trees; and (2) that no improvements are constructed on the ground around the tree within the tree protection zone, thus ensuring that there is sufficient undisturbed native soil surrounding the tree to provide adequate moisture, soil nutrients and oxygen for healthy root growth.
- Protect tree root systems from damage caused by (a) runoff or spillage of noxious materials while mixing, placing, or storing construction materials and (b) ponding, eroding, or excessive wetting caused by incident rainfall through use of the following measures during excavation and grading:
    - Excavation: Do not trench inside tree protection zones. Hand excavate under or around tree roots to a depth of three feet. Do not cut main lateral tree roots or taproots. Protect exposed roots from drying out before placing permanent backfill.
    - Grading: Maintain existing grades within tree protection zones. Where existing grade is two inches or less below elevation of finish grade, backfill with topsoil or

  - native soil from the project site. Place fill soil in a single un-compacted layer and hand grade to required finish elevation.
  - Apply six-inch average thickness of wood bark mulch inside tree protection zones. Keep mulch six inches from tree trunks.
- Provide 48-inch tall orange plastic construction fencing fastened to steel T-posts, minimum six feet in length, using heavyweight plastic ratchet ties. Install fence along edges of tree protection zones before materials or equipment are brought on site and construction operations begin. Maintain fence in place until construction operations are completed and equipment has been removed from site.
- Provide temporary irrigation to all trees in protection zones using a temporary on-grade drip or bubbler irrigation system sufficient to wet the soil within tree protection zones to a depth of 30 inches per bi-weekly irrigation event.

Heritage Tree Design Recommendations

- Establish the horizontal and vertical elevation of the Heritage Tree. Include the trunk location and tag number on all plans.
- Design finish grades so that no water accumulates around the base of the trunk of the Heritage Tree.
- Allow the Consulting Arborist to review all future project submittals including grading, utility, drainage, irrigation, and landscape plans.
- Maintain the tree protection zone around the Heritage Tree as depicted on the Grading and Drainage Plan prepared by Ruth and Going. The tree protection zone shall be the limit of work.
- Route underground services including utilities, sub-drains, water or sewer around the tree protection zone. Where encroachment cannot be avoided, special construction techniques such as hand digging or tunneling under roots shall be employed where necessary to minimize root injury.
- Use only herbicides safe for use around trees and labeled for that use, even below pavement.
- Design the landscape around the Heritage Tree to be compatible with the cultural requirements of native oak trees.
- Any irrigation system must be designed so that no trenching will occur within the dripline of the Heritage Tree.

Pre-construction and demolition treatments and recommendations

- The demolition contractor shall meet with the Consulting Arborist before beginning work to discuss work procedures and tree protection.
- Install protection at the tree protection zone prior to demolition, grubbing, or grading.
- No entry is permitted into a tree protection zone without permission of the project superintendent.

- The Heritage Tree should be pruned to reduce the length and weight of long, horizontal branches. Remove stubs only when there is well-developed woundwood present at the attachment. Do not remove the large stub in the center of the crown. All pruning shall be completed by an ISA Certified Arborist or Tree Worker and adhere to the latest editions of the American National Standards for tree work (Z133 and A300) and International Society of Arboriculture Best Management Practices, Pruning.
- The Heritage Tree should also be evaluated for installation of new cables to support heavy horizontal limbs.

Tree protection during construction

- Any grading, construction, demolition or other work that occurs within the tree protection zone should be monitored by the Consulting Arborist.
- If injury occurs to any tree during construction, it should be evaluated as soon as possible by the Consulting Arborist so that appropriate treatments can be applied.
- Fences are to remain until all site work has been completed. Fences may not be relocated or removed without permission of the project superintendent.
- Construction trailers, traffic and storage areas must remain outside fenced areas at all times.
- No materials, equipment, soil, waste, or wash-out water may be deposited, stored, or parked within the tree protection zone (fenced area).
- Any tree pruning needed for clearance during construction must be performed by a qualified arborist and not by construction personnel.
- Any roots damaged during grading or construction shall be exposed to sound tissue and cut cleanly with a saw.

PD BIO-3: The following measure will be implemented to reduce impacts to nesting birds:

- If possible, construction should be scheduled between September and January (inclusive) to avoid the nesting season. If this is not possible, pre-construction surveys for nesting raptors and other migratory breeding birds shall be conducted by a qualified ornithologist to identify active nests that may be disturbed during project implementation onsite and within 250 feet of the site. Between February and April (inclusive) pre-construction surveys shall be conducted no more than 14 days prior to the initiation of construction activities or tree relocation or removal. Between May and August (inclusive), pre-construction surveys shall be conducted no more than thirty (30) days prior to the initiation of these activities. The surveying ornithologist shall inspect all trees in and immediately adjacent to the construction area for nests.
- If an active nest is found in or close enough to the construction area to be disturbed by these activities, the ornithologist shall, in consultation with the California Department of Fish and Wildlife (CDFW), designate a construction-free buffer zone (typically 250 feet for raptors and 100 feet for other birds) around the nest, which shall be maintained until

after the breeding season has ended and/or a qualified ornithologist has determined that the young birds have fledged.

- The applicant shall submit a report indicating the results of the survey and any designated buffer zones to the satisfaction of the Director of Planning, Building and Code Enforcement prior to the issuance of any grading or building permit.

2.4.3 Cultural and Tribal Cultural Resources

PD CUL-1: The following project-specific measures shall be implemented during construction to avoid significant impacts to unknown subsurface cultural resources:

- In the event that prehistoric or historic resources are encountered during on-site construction activities, all activity within a 50-foot radius of the find shall be stopped, the Director of Community Development shall be notified, and a Secretary of the Interior-qualified archaeologist shall examine the find and record the site, including field notes, measurements, and photography for a Department of Parks and Recreation 523 Primary Record form. The archaeologist shall make a recommendation regarding eligibility for the California Register of Historical Resources, data recovery, curation, or other appropriate mitigation. Ground disturbance within the 50-foot radius can resume once these steps are taken and the Director of Planning, Building, and Code Enforcement has concurred with the recommendations. Within 30 days of the completion of construction or cultural resources monitoring, whichever comes first, a report of findings documenting any cultural resource finds, recommendations, data recovery efforts, and other pertinent information gleaned during cultural resources monitoring shall then be submitted to the Director of Planning, Building, and Code Enforcement. Once finalized, this report shall be submitted to the Northwest Information Center at Sonoma State University.

- Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program training to all existing and any new employees. This training should include: a discussion of applicable laws and penalties under the laws; samples or visual aids of artifacts that could be encountered in the project vicinity, including what those artifacts may look like partially buried, or wholly buried and freshly exposed; and instructions to halt work in the vicinity of any potential cultural resources discovery, and notify the city-approved archaeologist and Native American cultural resources monitor.

PD CUL-2: The following project-specific measures shall be implemented during construction to avoid significant impacts to unknown subsurface cultural resources:

- In the event that human remains are discovered during on-site construction activities, all activity within a 50-foot radius of the find shall be stopped. The Santa Clara County Coroner shall be notified and shall make a determination as to whether the remains are of Native American origin or whether an investigation into the cause of death is required. If the remains are determined to be Native American, the Coroner shall notify the Native American

Heritage Commission. All actions taken under this mitigation measure shall comply with Health and Human Safety Code § 7050.5(b).

2.4.4 Geology and Soils

PD GEO-1: In order to ensure the project design conforms to the requirements of a final geotechnical engineering investigation and California and local building standards and codes, the following is proposed as mitigation incorporated into the project. Incorporation will ensure seismic hazards are reduced to less than significant levels.

- The project shall be constructed in conformance with the recommendations of the design-level geotechnical investigation prepared for the project, as well as at the 2017 California Building Code, or subsequent adopted codes.

2.4.5 Hazards and Hazardous Materials

PD HAZ-1: The project proposes to implement the following measures which will reduce the potential for tracking of impacted soil from the adjacent parcel to the project site.

- During construction activities (e.g. grading, vehicle travel, movement of equipment or materials, etc.), adjacent to APN 706-02-058, the project contractor shall fence the southwesterly adjacent parcel (APN 706-02-058) separately from the rest of the site.

2.4.6 Hydrology and Water Quality

PD HYD-1: The project will incorporate the following into the design and these measures should be treated as mitigation incorporated into the project. The following will reduce construction-related water quality impacts:

- Burlap bags filled with drain rock shall be installed around storm drains to route sediment and other debris away from the drains.
- Earthmoving or other dust-producing activities shall be suspended during periods of high winds.
- All exposed or disturbed soil surfaces shall be watered at least twice daily to control dust as necessary.
- Stockpiles of soil or other materials that can be blown by the wind shall be watered or covered.
- All trucks hauling soil, sand, and other loose materials shall be required to be covered trucks or maintain at least two feet of freeboard.
- All paved access roads, parking areas, staging areas and residential streets adjacent to the construction site shall be swept daily (with water sweepers).
- Vegetation in disturbed areas shall be replanted as quickly as possible.

- All unpaved entrances to the site shall be filled with rock to knock mud from truck tires prior to entering City streets. A tire wash system may also be employed at the request of the City.
- The project proponent shall comply with the City of San José Grading Ordinance, including implementing erosion and dust control during site preparation and with the City of San José Zoning Ordinance requirements for keeping adjacent streets free of dirt and mud during construction.
- A Storm Water Permit shall be administered by the SWRCB. Prior to construction grading for the proposed land uses, the project proponents will file an NOI to comply with the General Permit and prepare a SWPPP which addresses measures that will be included in the project to minimize and control construction and post-construction runoff. Measures will include, but are not limited to, the aforementioned RWQCB Best Management Practices.
- The SWPPP shall be posted at the project site and shall be updated to reflect current site conditions.
- When construction is complete, a Notice of Termination for the General Permit for Construction shall be filed with the SWRCB. The Notice of Termination shall document that all elements of the SWPPP have been executed, construction materials and waste have been properly disposed of, and a post-construction stormwater management plan is in place as described in the SWPPP for the site.

2.4.7 Noise and Vibration

PD NOI-1: The project proposes to implement the following measures to reduce temporary construction noise to less than significant levels.

- Construction activities within 200 feet of commercial uses shall be limited to the hours between 7:00 AM and 7:00 PM, Monday through Friday.
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Unnecessary idling of internal combustion engines within 200 feet of commercial uses is strictly prohibited. Equipment shall be turned off when not in use and the maximum idling time shall be limited to five minutes.
- Locate stationary noise-generating equipment such as air compressors or portable power generators at least 200 feet from adjacent office and commercial uses to the greatest extent feasible.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Notify all adjacent business other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of "noisy" construction activities to the adjacent land uses.

PD NOI-2: The project applicant shall prepare a noise logistics plan, which shall be submitted for review and approval by the Supervising Planner of the Environmental Review Division of the Department of Planning, Building, and Code Enforcement prior to issuance of grading and building permits. This plan shall include, at a minimum, the following measures to reduce the exposure of adjacent office buildings to construction noise:

- All internal combustion engine-driven equipment shall use best available noise control practices and equipment (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). A letter from a qualified acoustic specialist shall be attached to the noise logistics plan along with a list of proposed construction equipment, certifying that the proposed construction equipment includes the best available noise attenuating technologies.
- The contractor will prepare a detailed construction plan identifying a schedule of major noise generating construction activities. This plan shall identify a noise control "disturbance coordinator" and procedure for coordination with the adjacent noise sensitive facilities so that construction activities can be scheduled to minimize noise disturbance. This plan shall be made publicly available for interested community members. The disturbance coordinator will be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the case of the noise complaint (e.g. starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. The telephone number for the disturbance coordinator construction site shall be posted on the construction site and included in a notice sent to adjacent commercial businesses regarding the construction schedule.
- All measures in the approved noise logistics plan shall be printed on all approved plans for grading and building permits.

ATTACHMENT BIO DR-32

Mitigation Monitoring and Reporting Plan (MMRP)

MITIGATION MONITORING AND REPORTING PROGRAM

Equinix Data Centers (SV-12, SV-13, SV-14) and Santa Teresa Substation Development Project
File No. SP15-031

CITY OF SAN JOSE
JANUARY 2017

CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY

PREFACE

Section 21081.6 of the California Environmental Quality Act (CEQA) requires a Lead Agency to adopt a Mitigation Monitoring and Reporting Program whenever it approves a project for which measures have been required to mitigate or avoid significant effects on the environment. The purpose of the monitoring and reporting program is to ensure compliance with the mitigation measures during project implementation.

In order to ensure the proposed project would not result in significant impacts, the applicant must agree to include and implement the mitigation measures contained herein before a proposed Mitigated Negative Declaration can be considered in accordance with the California Environmental Quality Act Guidelines.

I, __________, the applicant, on the behalf of_____________, hereby agree to fully implement the Mitigation Measures described below which have been developed in conjunction with the preparation of an Initial Study for my proposed project. I understand that these mitigation measures or substantially similar measures will be adopted as conditions of approval with my development permit request to avoid or significantly reduce potential environmental impacts to a less than significant level, where feasible.

This Mitigation Monitoring and Reporting Program addresses those measures in terms of how and when they will be implemented.

Applicant's Signature ______________________________________

Date____

CITY OF SAN JOSE CAPITAL OF SILICON VALLEY

Department of Planning, Building and Code Enforcement
HARRY FREITAS, DIRECTOR

Equinix Data Centers (SV-12, SV-13, SV-14) and Santa Teresa Substation Development Project File No. SP15-031

MITIGATIONS	MONITORING AND REPORTING PROGRAM					
	Documentation of Compliance [Applicant/Proponent Responsibility]			Documentation of Compliance [Lead Agency Responsibility]		
Adopted Mitigation Measures	Responsibility for Implementation [Who]	Method of Compliance Or Mitigation Action [What]	Timing of Compliance [When] G=Grading Permit P= Preconstruction D= Development B=Building Permit/Plan Check C=Certificate of Occupancy O=Ongoing	Monitoring Reporting Responsibility [Who will review]	Actions/ Reports [What will be reviewed]	Monitoring Timing or Schedule [How often]
Air Quality						
Environmental Impact: Testing of the emergency backup generators could exceed BAAQMD significance thresholds for NOx on both an average daily and annual averaging period. MM AIR-1: Generator operation for maintenance and testing purposes shall be limited so that the combined operation of all 21 generators does not exceed 356 hours in any consecutive 12-month period.	Project applicant.	Generator operation for maintenance and testing purposes shall be limited so that the combined operation of all 21 generators does not exceed 356 hours in any consecutive 12-month period.	C Prior to the issuance of an Occupancy Permit for each building.	Supervising Environmental Planner of the Department of Planning, Building and Code Enforcement (PBCE) and BAAQMD	Letter from BAAQMD and/or a qualified consultant.	The measure shall be implemented prior to issuance of an Occupancy Permit for each of the three buildings.

The maximum number of hours of operation of the generators for maintenance and testing is regulated by the Bay Area Air Quality Management District (BAAQMD), which will issue individual Permits to Operate for each data center building (or groups of generators) as they are constructed. The conditions in each Permit to Operate will be enforceable by BAAQMD. Prior to issuance of an occupancy permit for each building, the applicant shall provide a letter to the Director of Building, Planning and Code Enforcement from BAAQMD and/or a qualified consultant that documents that the sum of the hours of operation permitted and regulated by BAAQMD for the three data centers combined does not exceed 356 hours in any consecutive 12-month period. This letter shall include a copy of the BAAQMD approved Permit to Operate. If, subsequent to issuance of occupancy permits, there is a change to the number of generators, a change to the model of generators, or a change in the number of hours the generators will be tested, documentation shall be provided to the City of San José Department of Building, Planning and Code Enforcement that total emissions from maintenance and testing for the three data centers would not exceed the significance thresholds for Nitrogen Oxide (NOx) on both an average daily (54 pounds per day) and annual averaging (10 tons/year) period. This documentation shall be reviewed and approved by a Supervising Planner of the Environmental Review Division of the Department of Planning, Building, and Code Enforcement prior to the issuance of any Planning Permits approving changes to the generators.						

Biological Resources						
Environmental Impact: Development of the proposed project could result in impacts to nesting birds, if present on the site at the time of construction. MM BIO-1.1: If possible, construction should be scheduled between September and January (inclusive) to avoid the nesting season. If this is not possible, pre-construction surveys for nesting raptors and other migratory breeding birds shall be conducted by a qualified ornithologist to identify active nests that may be disturbed during project implementation onsite and within 250 feet of the site. Between February and April (inclusive) pre-construction surveys shall be conducted no more than 14 days prior to the initiation of construction activities or tree relocation or removal. Between May and August (inclusive), pre-construction surveys shall be conducted no more than thirty (30) days prior to the initiation of these activities. The surveying ornithologist shall inspect all trees in and immediately adjacent to the construction area for nests. MM BIO-1.2: If an active nest is found in or close enough to the construction area to be disturbed by these activities, the ornithologist shall, in consultation with the California Department of Fish and Wildlife (CDFW), designate a construction-free buffer zone (typically 250 feet for raptors and 100 feet for other birds) around the nest, which shall be maintained until after the breeding season has ended and/or a qualified ornithologist has determined that the young birds have fledged. MM BIO-1.3: The applicant shall submit a report indicating the results of the survey and any designated buffer zones to the satisfaction of the Director of Planning, Building and Code Enforcement prior to the issuance of any grading or building permit.	Project applicant.	Avoidance of construction activities during nesting season. If not possible, pre-construction surveys shall be conducted by a qualified ornithologist and construction-free buffer zones shall be designated around active nests. Submit a report indicating the results of the survey and any designated buffer zones to the Supervising Environmental Planner of PBCE.	G,D Prior to the issuance of grading permits and during construction, if needed.	Supervising Environmental Planner of PBCE.	The applicant shall submit a report indicating the results of the survey and any designated buffer zones to the Supervising Environmental Planner of PBCE.	The measure shall be implemented prior to and during construction activities.

Environmental Impact: Construction activities associated with the project could damage the City designated Heritage Tree at the corner of Via del Oro and Great Oaks Boulevard. MM BIO-2.1: A Tree Preservation Plan shall be prepared by a certified arborist prior to initiation of construction to describe how the Heritage Tree will be protected. The construction-phase Tree Preservation Plan shall include the following tree protection measures, which are based on guidelines established by the International Society for Arboriculture: a) Establish an area surrounding the Heritage Tree to be protected during construction as defined by a circle concentric with each tree with a radius 1-1/2 times the diameter of the tree canopy drip line. This "tree protection zone" is established to protect the tree trunk, canopy and root system from damage during construction activities and to ensure the long-term survival of the protected trees. The tree protection zone shall: (1) ensure that no structures or buildings, that might restrict sunlight relative to the existing condition, will be constructed in close proximity to the trees; and (2) that no improvements are constructed on the ground around the tree within the tree protection zone, thus ensuring that there is sufficient undisturbed native soil surrounding the tree to provide adequate moisture, soil nutrients and oxygen for healthy root growth. b) Protect tree root systems from damage caused by (a) runoff or spillage of noxious materials while mixing, placing, or storing construction materials and (b) ponding, eroding, or excessive wetting caused by incident rainfall through use of the following measures during excavation and grading: i) Excavation: Do not trench inside tree protection zones. Hand excavate under or around tree roots to a depth of three feet. Do not cut main lateral tree roots or taproots. Protect exposed roots from drying out before placing permanent backfill.	Project applicant.	A Tree Preservation Plan shall be prepared to describe how the Heritage Tree at the corner of Via del Oro and Great Oaks Boulevard will be protected.	G, D The Tree Preservation Plan shall be submitted prior to the issuance of grading permits and implemented during construction activities.	Supervising Environmental Planner of PBCE.	A Tree Preservation Plan shall be prepared and reviewed.	The measures in the Tree Preservation Plan shall be implemented prior to and during construction activities.

ii) Grading: Maintain existing grades within tree protection zones. Where existing grade is two inches or less below elevation of finish grade, backfill with topsoil or native soil from the project site. Place fill soil in a single un-compacted layer and hand grade to required finish elevation. iii) Apply six-inch average thickness of wood bark mulch inside tree protection zones. Keep mulch six inches from tree trunks. c) Provide 48-inch tall orange plastic construction fencing fastened to steel T-posts, minimum six feet in length, using heavyweight plastic ratchet ties. Install fence along edges of tree protection zones before materials or equipment are brought on site and construction operations begin. Maintain fence in place until construction operations are complete and equipment has been removed from site. d) Provide temporary irrigation to all trees in protection zones using a temporary on-grade drip or bubbler irrigation system sufficient to wet the soil within tree protection zones to a depth of 30 inches per bi-weekly irrigation event.						
Cultural Resources						
<u>Environmental Impact:</u> Construction of the proposed project could impact unknown buried paleontological and/or archaeological or historic resources, if present on-site. MM CUL-1.1: An archaeologist qualified in local historical and prehistory archaeology shall complete a subsurface presence/absence program to determine whether any intact archaeological deposits are present on-site. Preparation of that work shall include aligning pertinent historic-period maps to the project area to identify specific sensitive areas that could be impacted by the proposed development. Should any archaeological features or deposits be identified, a focused research	Project applicant.	A project-specific subsurface presence/absence program to determine whether any intact archaeological deposits are present on-site shall be completed on-site by a qualified archaeologist.	G Prior to the issuance of the first grading permit for the project.	Supervising Environmental Planner of PBCE.	A letter report summarizing the results of the subsurface presence/absence program shall be submitted and reviewed. A treatment plan shall be prepared and implemented, if	The subsurface presence/absence program (and treatment plan, if needed) shall be implemented prior to construction grading activities.

design and treatment plan shall be prepared to address any potential resources exposed during construction activities followed by archaeological excavation of these features.					recommended in the letter report.	
MM CUL-1.2: In the event of the discovery of prehistoric or historic archaeological deposits or paleontological deposits, work shall be halted within 50 feet of the discovery and a qualified professional archaeologist (or paleontologist, as applicable) shall examine the find and make appropriate recommendations regarding the significance of the find and the appropriate mitigation. The recommendation shall be implemented and could include collection, recordation, and analysis of any significant cultural materials.	Project applicant.	A qualified archaeologist and/or paleontologist shall examine any prehistoric or historic archaeological deposits and make appropriate recommendations regarding the significance of the find and appropriate mitigation.	D During project construction.	Supervising Environmental Planner of PBCE.	A report of findings documenting any data recovered during monitoring shall be prepared reviewed.	The measure shall be implemented during construction activities.
MM CUL-1.3: Pursuant to Section 7050.5 of the Health and Safety Code and Section 5097.94 of the Public Resources Code of the State of California, in the event of the discovery of human remains during construction, there shall be no further excavation or disturbance of the site within a 50-foot radius of the remains or any nearby area reasonably suspected to overlie adjacent remains. The Santa Clara County Coroner shall be notified and shall make a determination as to whether the remains are Native American. If the Coroner determines that the remains are not subject to his authority, he shall notify the Native American Heritage Commission who shall attempt to identify descendants of the deceased Native American. If no satisfactory agreement can be reached as to the disposition of the remains pursuant to this State law, then the land owner shall re-inter the human remains and items associated with Native American burials on the property in a location not subject to further subsurface disturbance.	Project applicant.	If any human remains are found during any field investigations, grading, or other construction activities, all provisions of California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.94, shall be followed. If the remains are believed to be Native American, the Coroner must contact the Native American Heritage Commission within 24 hours.	D During grading and development activities.	Supervising Environmental Planner of PBCE.	Contact Santa Clara County Coroner for determination of origin. Supervising Environmental Planner of PBCE consults with MLD or a designated representative to determine appropriate treatment of remains.	The measure shall be implemented during construction activities.
MM CUL-1.4: A final report summarizing the discovery of cultural materials shall be submitted to the City's Environmental Senior Planner prior to issuance of building permits. This report shall contain a description of the mitigation program that was implemented and its results, including a description of the monitoring and testing program, a list of the resources found, a summary	Project applicant.	In the event cultural materials are discovered on the site, a report shall be prepared verifying completion of the mitigation program to the satisfaction of the	P Prior to issuance of a Building permit.	Supervising Environmental Planner of PBCE.	A report summarizing discovered cultural materials and completion of the mitigation	Once, prior to issuance of a Building Permit. [If a discovery occurs after a Building

of the resources analysis methodology and conclusion, and a description of the disposition/curation of the resources. The report shall verify completion of the mitigation program to the satisfaction of the Environmental Senior Planner.		Supervising Environmental Planner of PBCE.			program shall be prepared and reviewed.	Permit is issued, the report shall be submitted prior to issuance of an Occupancy Permit].
Noise						
<u>Environmental Impact:</u> Construction activities associated with the data center project could result in construction-related noise impacts as substantial noise generating activities will occur within 200 feet of existing office uses for a period of more than twelve months. MM NOI-1: The project applicant shall prepare a noise logistics plan, which shall be submitted for review and approval by the Supervising Planner of the Environmental Review Division of the Department of Planning, Building, and Code Enforcement prior to issuance of grading and building permits. This plan shall include, at a minimum, the following measures to reduce the exposure of adjacent office buildings to construction noise: 1) Construction hours within 200 feet of commercial uses shall be limited to the hours of 7:00 a.m. and 7:00 p.m. weekdays, with no construction on weekends or holidays. Pile driving shall be limited to the hours of 8:00 a.m. to 5:00 p.m. Monday through Friday. 2) Utilize 'quiet' models of air compressors and other stationary noise sources where technology exists. A letter from a qualified acoustic specialist shall be attached to the noise logistics plan along with a list of proposed construction equipment, including air compressors and other stationary noise sources, certifying that the	Project applicant.	The noise logistics plan shall be prepared and implemented by the applicant to reduce the exposure of adjacent office buildings to project construction noise.	G, D Noise logistics plan submitted prior to the issuance of first grading permit. Measures in the plan shall be implemented during construction.	Supervising Environmental Planner of PBCE.	A noise logistics plan to reduce construction noise shall be prepared and reviewed.	A plan shall be submitted prior to issuance of grading permit(s). Measures in the plan shall be implemented during all subsequent construction activities on the site.

proposed construction equipment includes the best available noise attenuating technologies. 3) All internal combustion engine-driven equipment shall use best available noise control practices and equipment (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). A letter from a qualified acoustic specialist shall be attached to the noise logistics plan along with a list of proposed construction equipment, certifying that the proposed construction equipment includes the best available noise attenuating technologies. 4) Locate all stationary noise-generating equipment, such as air compressors and portable power generators, at least 200 feet from adjacent office and commercial land uses. 5) Locate staging areas and construction material areas at least 200 feet from adjacent office and commercial land uses to the greatest extent feasible. 6) Prohibit all unnecessary idling of internal combustion engines. Equipment shall be shut off when not in use and the maximum idling time shall be limited to five minutes. 7) The contractor will prepare a detailed construction plan identifying a schedule of major noise generating construction activities. This plan shall identify a noise control 'disturbance coordinator' and procedure for coordination with the adjacent noise sensitive facilities so that construction activities can be scheduled to minimize noise disturbance. This plan shall be made publicly available for interested community members. The disturbance coordinator will be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the case of the noise complaint (e.g. starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. The telephone number for the disturbance coordinator at the						

construction site shall be posted on the construction site and included in a notice sent to adjacent commercial businesses regarding the construction schedule. 8) All measures in the approved noise logistics plan shall be printed on all approved plans for grading and building permits.						

ATTACHMENT BIO DR-33

Prior IS/MND Supporting Technical Studies

XILINX DATA CENTER: SV-12, SV-13, and SV-14 5 - 7 GREAT OAKS BOULEVARD SAN JOSE, CALIFORNIA

AIR QUALITY ASSESSMENT

June 16, 2016

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Project 15-237

INTRODUCTION

This report provides the results of an assessment of potential air quality impacts from the proposed Xilinx Data Center located in south San José to the north of Santa Teresa Boulevard, between San Ignacio Avenue and Great Oaks Boulevard. The proposed data center would be comprised of three data center buildings (SV-12, SV-13, and SV-14) on an approximately 18-acre site. The three data centers buildings, each approximately 188,000 square feet in size, would be located on the northern portion of the site. In addition to the construction of the three data center buildings, the project proposes to install two new 21 kilovolt (kV) distribution feeders and construct a new substation (Santa Teresa Substation) at the existing Pacific Gas and Electric (PG&E) Edenvale Service Center, northwest of the data center project site. The locations of the new data center and new substation are shown in Figure 1.

The new data center buildings would house computer servers and supporting equipment for private clients, as well as associated office uses, in environmentally controlled structures. Standby backup electricity for each building would be provided by seven diesel fueled engine-generators located in the equipment yards adjacent to each building (six primary and one back-up generator). A total of 21 diesel-fueled emergency generators would be installed at the data center site. The diesel-fueled emergency backup generators would be used to provide for an uninterrupted power supply. The generators would provide back-up power to the data center when equipment failure or other conditions result in an interruption to the utility-provided electric power. Diesel fuel for generators will be stored in 8,000 gallon aboveground tanks under each generator. The electric generating capacity of each generator would be approximately 3 megawatts (MW).

Figure 1 – Project Components

The project site is in a mixed-use residential/office/commercial area of the City of San Jose. The proposed project components, data center and new substation, would be located near existing residences (sensitive receptors) that could be affected by construction and operation of the proposed project.

The primary source of air pollutant emissions from the data centers would be from operation of the generator engines during testing and maintenance of emergency generators. During normal facility operation these engines will not be operated other than for periodic testing and maintenance requirements. The 3 MW generators would use diesel-fueled engines that meet U.S. EPA Tier 2 emission standards. The engines would be fueled using ultra low sulfur diesel fuel with a maximum sulfur content of 15 parts per million (ppm), which minimizes both particulate matter and sulfur dioxide (SO_2) emissions.

This analysis evaluates the potential air quality impacts from construction and operation of the proposed project that includes construction of data center buildings and substation, and installation and operation of 21 new backup emergency generators at the new data. The proposed project would establish new sources of particulate matter and gaseous emissions. Operational emissions would be from the data center and would primarily result from the testing of the emergency backup generators. The air quality impacts were evaluated in terms of construction and operational impacts to air quality with the primary focus on evaluating the effects of future project-related emissions on regional air quality and on local sensitive receptors. This analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1] Note that an Authority to Construct and Permit to Operate permit would be required from the BAAQMD prior to construction and operation of the proposed project diesel engines, which may require further analysis of air quality impacts.

SETTING

The project is located in Santa Clara County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$).

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NOx). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

[1] Bay Area Air Quality Management District, 2011. BAAQMD CEQA Air Quality Guidelines. May.

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and Federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the state's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB and the U.S. EPA have adopted and implemented a number of regulations and emission standards for stationary and mobile sources to reduce emissions of diesel particulate matter (DPM). These include emission standards for off-road diesel engines, including diesel generators, and regulatory programs that affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: infants, children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The closest sensitive receptors to the proposed data center project site are existing residences along Santa Teresa Boulevard across from the site. For the proposed substation, the closest sensitive receptors are residences on Autotech Driver and Cheryl Beck Drive west of the substation site.

BAAQMD

The Bay Area Air Quality Management District (BAAQMD) is the regional agency tasked with managing air quality in the region. At the State level, the California Air Resources Board (a part of the California Environmental Protection Agency) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has published CEQA Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.[2]

SIGNIFICANCE THRESHOLDS

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These Thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the Air District's updated CEQA Guidelines (updated May 2011). The significance thresholds identified by BAAQMD and used in this analysis are summarized in Table 1.

BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines was called into question by an order issued March 5, 2012, in California Building Industry Association

[2] Bay Area Air Quality Management District. 2011. BAAQMD CEQA Air Quality Guidelines. May.

(CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, the California Supreme Court accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument considered was whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). On December 17, 2015, the California Supreme Court ruled that CEQA generally does not require an analysis of the effects of existing environmental conditions (e.g., air quality) on a project unless the project would exacerbate those conditions somehow through its construction and/or operation. The project does not include sensitive receptors.

Table 1. Air Quality Significance Thresholds

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
Criteria Air Pollutants			
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82	82	15
$PM_{2.5}$	54	54	10
CO	Not Applicable	9.0 ppm (8-hr) or 20.0 ppm (1-hr)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Single-Source Contribution - Health Risks and Hazards for Sensitive Receptors			
Excess Cancer Risk	> 10.0 per one million		
Hazard Index	> 1.0		
Annual Average $PM_{2.5}$	> 0.3 µg/m^3		
Cumulative Health Risks and Hazards for Sensitive Receptors			
Excess Cancer Risk	> 100.0 per one million		
Chronic Hazard Index	> 10.0		
Annual Average $PM_{2.5}$	> 0.8 µg/m^3		

Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.

IMPACTS AND MITIGATION

Impact: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The Bay Area is considered a nonattainment area for ground-level ozone and $PM_{2.5}$ under both the federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM_{10} under the California Clean Air Act, but not the federal Act. The area has attained both State and federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone, PM_{10} and $PM_{2.5}$, BAAQMD has established thresholds of significance for air pollutants. These thresholds are for ozone precursor pollutants (ROG and NOx), PM_{10} and $PM_{2.5}$ and apply to both construction period and operational period impacts.

Construction Period Emissions

The overall data center project site area is approximately 18 acres and would involve site preparation and the separate construction of three new 188,000-square foot data centers. There would also be construction of two new 21 kilovolt (kV) distribution feeders and construct a new substation (Santa Teresa Substation) at the existing Pacific Gas and Electric (PG&E) Edenvale Service Center. Construction activities would occur over several years in phases. Construction emissions were assessed.

The California Emissions Estimator Model, Version 2013.2.2 (CalEEMod) was used to compute construction emissions for the data center and the substation. This modeling was conducted by developing five different model runs to represent all of the on-site preparation work, construction of the SV-12 data center, SV-13 data center, SV-14 data center and the off-site distribution feeders and substation.

The construction and schedule and projected equipment usage were provided to input to the model. Inputs to the CalEEMod model are summarized as follows (CalEEMod output files and provided construction assumptions are included as *Attachment 1* to this report):

Site Preparation
For the site preparation phase, the land uses input were 573,000 square foot "Industrial Park" and a 299-space "Parking Lot" on an 18-acre site. Two construction phases were selected: Site Preparation and Grading/Excavation. The begin date for construction, and anticipated durations for each phase were input to CalEEMod. Equipment usage was provided in terms of hours per day for each phase. No import or export of material is anticipated, as the site is relatively flat. Vehicle trips were based on model defaults.

SV-12 Data Center
The SV-12 Data Center Building was modeled in CalEEMod as a 188,000 sf "Industrial Park" with an 86-space "Parking Lot" on a 2.93-acre site. Four construction phases were modeled using the anticipated schedule and projected equipment usage: Grading, Building Construction, Architectural Coating and Paving. Worker and vendor trips were based on model defaults.

SV-13 Data Center
The SV-13 Data Center Building was modeled in CalEEMod as a 191,000 sf "Industrial Park" with an 86-space "Parking Lot" on a 2.93-acre site. Four construction phases were modeled using the anticipated schedule and projected equipment usage: Grading, Building Construction, Architectural Coating and Paving. Worker and vendor trips were based on model defaults.

SV-14 Data Center

The SV-14 Data Center Building was modeled in CalEEMod as a 191,000 sf "Industrial Park" with an 86-space "Parking Lot" on a 3.29-acre site. Four construction phases were modeled using the anticipated schedule and projected equipment usage: Grading, Building Construction, Architectural Coating and Paving. Worker and vendor trips were based on model defaults.

Substation and Distribution Feeders

All emissions from the Substation and distribution feeder construction activities were modeled in CalEEMod as a 65,340 sf "General Light Industry" land use on a 2.10-acre site. Eight construction phases were modeled using the anticipated schedule and projected equipment usage: Relocation activities (i.e., demolition), Site Preparation, Paving, Excavation, Building Construction Substation, Building Construction Distribution Line, Building Construction Overhead Line, and Trenching. Worker and vendor trips were based on model defaults. Haul truck trips were added for export of 1,800 cubic yards and import of 8,525 cubic yards of soil. Vendor trips were added for 40 cement truck trips.

Based on a construction start date of November 2016 and an anticipated construction period of 290 work days for each data center building, construction would be completed in 2020. CalEEMod computes 869 construction days. Total construction emissions from full build out of the project and substation/distribution feeders are shown in Table 2. Average daily emissions are computed assuming that construction occurs over 869 days.

Table 2. Construction Period Emissions – Xilinx Project and Santa Teresa Substation

Description	ROG Emissions (tons)	NOx Emissions (tons)	PM10 Exhaust Emissions (tons)	PM2.5 Exhaust Emissions (tons)
Site Preparation Work (2016)	0.12 tons	1.40 tons	0.07 tons	0.06 tons
Building SV-12 (2016-17)	1.47 tons	3.79 tons	0.23 tons	0.22 tons
Building SV-13 (2017-19)	1.40 tons	3.30 tons	0.19 tons	0.18 tons
Building SV-14 (2019-20)	1.36 tons	2.98 tons	0.16 tons	0.15 tons
Substation and Feeders (2018-19)	0.06 tons	0.64 tons	0.03 tons	0.02 tons
Daily Project Emissions	*10 lbs/day*	*28 lbs/day*	*2 lbs/day*	*1 lbs/day*
BAAQMD Thresholds	*54lbs/day*	*54lbs/day*	*82lbs/day*	*54lbs/day*
Significant?	***No***	***No***	***No***	***No***

Note: Average daily emissions were computed by dividing total construction emissions by the number of workdays. CalEEMod predicts that the proposed project would require 869 construction days.

Construction Fugitive Dust

During grading and construction activities, dust would be generated. Most of the dust would result during grading activities. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed at any given time, amount of activity, soil conditions and meteorological conditions. Nearby areas could be adversely affected by dust generated during construction activities. Nearby land uses are primarily commercial and office uses that are separated by roadways or open areas. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are employed to reduce these emissions. This impact is considered less-than-significant with implementation of *Mitigation Measures AQ-1*.

Mitigation Measure AQ-1: Include basic measures to control dust and exhaust during construction.

During any construction period ground disturbance, the applicant shall ensure that the project contractor implement measures to control dust and exhaust. Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a less than significant level. The contractor shall implement the following best management practices that are required of all projects:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Xilinx Data Center Operational Project Emissions

The primary emission sources associated with operation of the proposed project would include testing or maintenance of the 21 diesel-fueled 3-MW emergency backup generators. There would be minor emissions from traffic and area sources associated with operation of the data center facilities. Additionally, the 8,000 gallon aboveground diesel storage under each generator would have minor evaporative emission of ROG. Emissions from these sources are described below.

Note that operation of the proposed Santa Teresa Substation would result in negligible daily operational emissions. Operational emissions from the substation were assumed to be less than 1 pound per day of each criteria air pollutant and no modeling was conducted.

<u>Area and Mobile Source Emissions</u>

Development of the project would increase the number of vehicle trips generated from the site (i.e., employees/tenants and vendor delivery trips), which would lead to increased air pollutant emissions. There would also be area source emissions associated with normal facility operation and maintenance.

Project related mobile source and area source emissions were modeled using CalEEMod with default conditions for an industrial park type project along with project vehicle traffic.

The CalEEMod operational model included 573,000 sf "Industrial Park and a 299-space "Parking Lot" on an 18-acre site. Model defaults were used with the following exceptions:

- A trip generation rate of 1.7 trips per 1,000 sf was used to represent traffic for a data center. This trip rate is based on a traffic analysis conducted by Hexagon Transportation Consultants for a data center project in Santa Clara[3]. Hexagon cited an ITE trip rate of 0.99 trips per 1,000 sf, but counted peak-hour trips that were 170 percent of the predicted trips.

- Energy usage was adjusted to reflect current State Title 24 energy efficiency requirements. The 2013 Title 24 Building Standards became effective July 1, 2014 and are predicted to use 25 percent less energy for lighting, heating, cooling, ventilation, and water heating for residential uses and 30 percent less energy for non-residential uses than the 2008 standards that CalEEMod incorporates.[4] Therefore, the CalEEMod default values for electricity and natural gas consumption by land use would adjusted to account for the greater energy efficiency through implementation of 2013 Title 24 standards and multiplied by the project energy data to determine annual GHG energy emissions.

CalEEMod predicted annual emissions that were converted to daily emissions based on 365 days of operation. CalEEMod model output for the operational emissions are contained in *Attachment 2*.

Emergency Generator Emissions

The proposed project would install twenty-one 3-MW emergency generators equipped with Cummins diesel-fueled engines. These engines would not be operated other than for periodic testing and maintenance requirements during normal facility operation. The generator engines would be fueled using ultra low sulfur diesel fuel with a maximum sulfur content of 15 ppm. The diesel engines would meet U.S. EPA Tier 2 emission standards. These generators, seven per data center building, would be located in the equipment yards adjacent to each building. The generator equipment and operating specifications for the proposed generators are provided in Table 3.

[3] Hexagon Transportation Consultants. 2013. Memorandum to Dennis Ng, City of Santa Clara from Robert Del Rio - *CoreSite Trip Generation and Operations Analysis*. October 14.
[4] California Energy Commission, 2014. *New Title 24 Standards Will Cut Residential Energy Use by 25 Percent, Save Water, and Reduce Greenhouse Gas Emissions*. July. Available online: http://www.energy.ca.gov/releases/2014_releases/2014-07-01_new_title24_standards_nr.html

Table 3. Engine Generator Systems Equipment and Operating Information

Description		Value
3,000 kW Cummins Model C3000D6e Generator Sets		**Cummins QSK95-G9 diesel engines**
Generator Output (at 100% load)		3,000 kW
Engine Output (Standby)	at 100% Load	4,307 horsepower
	at 25% Load	1,155 horsepower
Diesel Fuel Consumption	at 100% Load	208 gallons/hour
	at 25% Load	68 gallons/hour
Diesel Fuel Sulfur Content		0.0015% (15 ppm)
Exhaust Flow Rate	at 100% Load	23,365 actual cubic feet/minute
	at 25% Load	10,028 actual cubic feet/minute
Stack Height (above ground level)		19.3 feet
Stack Inside Diameter		20 inches
Exhaust gas Temperature	at 100% Load	830 ^{o}F
	at 25% Load	630 ^{o}F

Note: 25% engine load was used to represent engine operation under no load conditions.

The operations of these generators are limited to 50 hours per year of non-emergency use (i.e. testing and maintenance) by the State's Air Toxic Control Measure for Stationary Compression Ignition Engines.[5] The project would include that testing of each generator would generally be preformed twice per month to make sure that they are ready to come online when needed in the event of a power failure. The testing is proposed to take place between the hours of 8:00 AM to 5:00 PM. Normal generator testing at no load for 5 minutes would occur monthly and generator testing at full load (100 percent load) for 1 hour would occur for 11 months of the year. In addition to the normal engine testing and operation for maintenance purposes, each engine would undergo generator load testing for up to four hours per year with the engine at full load. Total generator engine operation under normal conditions is expected to be about 16 hours per year, per engine. However, engine operation may occur more frequently due to increased testing or maintenance requirements. For purposes of estimating emissions and potential air quality impacts from the engines, it was assumed that each engine would be operated at full load (100% engine load) for 50 hours per year (maximum operation hours allowed by the State's Air Toxic Control Measure and BAAQMD for testing and maintenance). Detailed emissions information is provided in *Attachment 2*.

Table 4. Combined SV-12, SV-13, and SV-14: 50 Hours per Year Full Load Operation per Engine Average Daily and Annual Emissions from Emergency Generators

Pollutant	Average Daily Emissions All 21 Units[a] (lb/day)	Total Annual Emissions[b]: 50 Hours Operation All 21 Units (lb/year)	(ton/year)
NOx	142.9	52,144	26.1
ROG	2.7	997	0.5
CO	10.9	3,988	2.0
PM_{10}	0.4	130	0.06
$PM_{2.5}$	0.3	121	0.06
SO_2	0.13	46	0.02

[a] Average daily emissions calculated from total annual emissions and 365 days per year.
[b] Assumes operation at 100% engine load for 50 hours/year per engine.

[5] Section 93115, title 17, California Code of Regulations

This analysis computed the number of hours that each generator could operate at full load and not cause project emissions that would exceed any of the significance thresholds. Assuming full-load testing or operation for each generator of 16 hours per year, emissions of NOx would be 45.7 pounds per day and 8.3 tons per year (see Table 5). There would be some emissions associated with worker traffic that are not included in this table.

Table 5. Combined SV-12, SV-13, and SV-14: 16 Hours per Year Full Load Operation per Engine Average Daily and Annual Emissions from Emergency Generators

Pollutant	Average Daily Emissions All 21 Units[a] (lb/day)	Total Annual Emissions[b]: 16 Hours Operation All 21 Units (lb/year)	Total Annual Emissions[b]: 16 Hours Operation All 21 Units (ton/year)[c]
NOx	45.7	16,686	8.3
ROG	0.9	319	0.2
CO	3.5	1,276	0.6
PM_{10}	0.1	41	0.02
$PM_{2.5}$	0.1	39	0.02
SO_2	0.04	15	0.01

[a] Average daily emissions calculated from total annual emissions and 365 days per year.
[b] Assumes operation at 100% engine load for 16 hours/year per engine.

The estimated total emissions from the engines at SV-12, SV-13, and SV-14 under expected operating conditions (16 hours per year per engine) for testing and maintenance are shown in Table 6. These, also, do not include emissions from worker traffic.

Table 6. Combined SV-12, SV-13, and SV-14
Maximum Daily and Annual Emissions from Emergency Generators

Pollutant	Average Daily Emissions All 21 Units[a] (lb/day)	Total Annual Emissions[b]: 16 Hours Operation All 21 Units (lb/year)	Total Annual Emissions[b]: 16 Hours Operation All 21 Units (ton/year)[c]
NOx	43.4	15,827	7.9
ROG	0.9	315	0.2
CO	3.3	1,221	0.6
PM_{10}	0.1	50	0.02
$PM_{2.5}$	0.1	47	0.02
SO_2	0.04	14	0.01

[a] Average daily emissions calculated from total annual emissions and 365 days per year.
[b] Assumes operation at 100% engine load for 15 hours/year per engine and a total of 1 hour per year at 25% load.
[c] Short tons (2,000 lbs per ton).

Diesel Fuel Storage Emissions

Diesel fuel for each emergency generator would be stored in 8,000 gallon sub-base tanks of the generator housing units. Diesel fuel has a very low volatility and emissions of ROG from fuel storage are expected to be negligible.

Total Project Emissions

Total daily and annual emissions from the emergency generators, mobile and area sources are summarized in Table 7 for each modeled scenario. Without any limitations on engine operation for maintenance and testing purposes, total increased average daily and annual emissions from operation of the project are estimated to be above the significance thresholds established by the BAAQMD for NOx on both a average daily and annual averaging period. This would be considered a *less than significant impact*

> *Mitigation Measure AQ-2:* Include recommended conditions of approval that limit the number of hours generators can be operated for maintenance and testing purposes as follows:
>
> > *Generator operation for maintenance and testing purposes shall be limited so that the combined operation of all 21engines does not exceed to 356 hours in any consecutive 12-month period*
>
> Effectiveness of Mitigation: Without limitations on the number of hours, operation of the project could cause annual and average daily emissions of NOx to exceed significance thresholds. Limiting generator operations for maintenance and testing purposes for all engines to a total of 356 hours would result in average daily total project NOx emissions of 54 pounds per day, which would not exceed the significance threshold of 54 pounds per day. Emissions would also not exceed 10 tons per year.

Table 7. Summary of Operational Average Daily Emissions in tons and (lb/day)

Emission Source	Nitrogen Oxides (NOx)	Reactive Organic Gases (ROG)	Respirable Particulates (PM_{10})	Fine Particulates ($PM_{2.5}$)
BAAQMD Threshold	*10 (54)*	*10 (54)*	*15 (82)*	*10 (54)*
Maximum Emissions Scenario (50 hrs/engine per year at full load)				
Emergency Generators	26.1 (143)	0.5 (3)	0.1 (<1)	0.1 (<1)
Mobile & Area Sources	1.1 (6)	3.3 (18)	0.8 (4)	0.2 (1)
Total	**27.2 (149)**	**3.8 (21)**	**0.9 (5)**	**0.3 (2)**
Significant?	**Yes**	No	No	No
Reduced Emissions Scenario (16 hrs/engine per year at full load)				
Emergency Generators	8.3 (46)	0.2 (1)	<0.1 (<1)	<0.1 (<1)
Mobile & Area Sources	1.1 (6)	3.3 (18)	0.8 (4)	0.2 (1)
Total	**9.4 (52)**	**3.8 (21)**	**0.9 (5)**	**0.3 (2)**
Significant?	No	No	No	No
Proposed Testing Schedule Scenario (15 hrs/engine per year at full load 1 hr/engine/year 25%) load)				
Emergency Generators	7.9 (43)	0.2 (1)	<0.1 (<1)	<0.1 (<1)
Mobile & Area Sources	1.1 (6)	3.3 (18)	0.8 (4)	0.2 (1)
Total	**9.0 (49)**	**3.8 (21)**	**0.9 (5)**	**0.3 (2)**
Significant?	No	No	No	No

Impact: Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Air Quality Standards for Regional Air Pollutants

Due to the limited number of hours that each emergency generator would be operated for testing and maintenance purposes emissions from these units are relatively low. Emissions of nonattainment pollutants and their precursors that affect air quality standards at the regional level were evaluated under Impact 2. Although the project could cause a cumulatively considerable net increase in ozone precursor emissions, they are no expected to cause or substantially contribute to a violation of an ozone ambient air quality standard.

Air Quality Standards for Local Air Pollutants (Carbon Monoxide from Project Traffic)

Increased intersection congestion can lead to increased localized CO concentrations (hot spots) in the vicinity of the intersection. Typically there needs to be a substantial increase in the number of vehicles accessing an intersection and a decrease in the intersection level of service (LOS) in order for there to be elevated CO concentrations of concern. Since the number of vehicles associated with the project would be minimal, the proposed project would not cause or contribute to a violation of an ambient air quality standard and the impact is considered *less than significant*

Impact: Expose sensitive receptors to substantial pollutant concentrations?

The proposed data center project would be a source of air pollutant emissions during project construction and then from operation of emergency generators for testing and maintenance purposes. These generators are diesel-fueled, so they emit DPM, which is a toxic air contaminant (TAC). The generators are also a source of $PM_{2.5}$, which has known adverse health effects. Construction of the proposed Santa Teresa Substation would be a source of TAC and $PM_{2.5}$ emissions. As discussed above, operation of the substation would generate negligible emissions, including TACs and $PM_{2.5}$.

The BAAQMD CEQA Air Quality Guidelines considers exposure of sensitive receptors to air pollutant levels that result in an unacceptable cancer risk or hazard to be significant. For cancer risk the BAAQMD considers an increased risk of contracting cancer that is greater than 10.0 in one million to be significant for a single source. For cumulative exposure to TACs from existing sources affecting a sensitive receptor, in addition to a proposed new source, the BAAQMD considers an increased risk of contracting cancer that is greater than 100 in one million to be significant. The BAAQMD CEQA Guidelines also consider exposure to annual $PM_{2.5}$ concentrations that exceed 0.3 micrograms per cubic meter ($\mu g/m^3$) from a single source to be significant and an annual $PM_{2.5}$ concentration that exceed 0.8 $\mu g/m^3$ from cumulative sources to be significant.

The primary community risk impact issues associated with construction emissions and operation of the data center emergency generators are cancer risk and exposure to $PM_{2.5}$. Diesel exhaust from construction activities and operation of emergency generators pose both a potential health and nuisance impact to nearby receptors. Community health risk impacts to sensitive receptors from construction and operational activities were evaluated by predicting potential DPM and $PM_{2.5}$ exposures to off-site sensitive receptors and then calculating increased lifetime cancer risks and non-cancer health effects. DPM and $PM_{2.5}$ emissions at each construction site and for operation of the data center emergency generators were calculated and dispersion modeling conducted to predict the off-site concentrations so that lifetime cancer risks and non-cancer health effects could be evaluated. *Attachment 2* includes a description of how community health impacts, including cancer risk are computed based on BAAQMD recommended methods.

Health impacts from construction and operation of the proposed data center and from construction of the Santa Teresa Substation are detailed below. Since the data center and substation sites are more than 2,000 feet apart and sensitive receptors potentially affected by each site are separated by more than 1,000 feet, it is not expected that emissions from one site will significantly affect impacts at the sensitive receptors at the other site. As such, the health impacts from the data center and substation construction and operation activities are evaluated and reported separately.

<u>Community Risk – Xilinx Data Center Health Risk and Hazards</u>

Data Center Construction Health Impacts

Construction of the data center would expose sensitive receptors in the project area to DPM from construction related activities. Sensitive receptors in the data center area are the existing nearby off-site residences. The closest existing residences to the data center site are located south of the site across Santa Teresa Boulevard. A health risk assessment of the data center construction activities was conducted that evaluated potential health effects at nearby sensitive receptors from construction DPM emissions. A dispersion model was used to predict the off-site concentrations resulting from project construction so that lifetime cancer risks could be predicted. Figure 2 shows the data center project site and sensitive receptor locations (residences) used in the air quality dispersion modeling analysis where potential health impacts were evaluated.

Construction period emissions were computed using CalEEMod along with projected construction activity, as previously described. The number and types of construction equipment and diesel vehicles, along with the anticipated length of their use for different phases of construction, were based on a site-specific construction schedule. Construction of the project is expected to occur over an approximate five-year period starting in 2016. The CalEEMod model provided annual $PM_{2.5}$ exhaust emissions (assumed to be DPM) for each year of construction for the off road construction equipment used and for the exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles). The total DPM emissions over the entire construction period were calculated as 0.663 tons (1,326 pounds). A trip length of one-half mile was used to represent vehicle travel while at or near the construction site. For modeling purposes, it was assumed that these emissions from on-road vehicles would occur at the construction site. Fugitive dust $PM_{2.5}$ emissions were also computed and included in this analysis. The model predicts total construction period fugitive $PM_{2.5}$ emissions of 0.120 tons (240 pounds).

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ at existing off-site sensitive receptors in the vicinity of the data center construction site. The AERMOD modeling utilized four area sources to represent the on-site emissions from the different construction areas. To represent the construction equipment exhaust emissions, an emission release height of 6 meters (20 feet) was used for each area source. The elevated source height reflects the height of the equipment exhaust pipes and buoyancy of the exhaust plume. For modeling fugitive $PM_{2.5}$ emissions, a near ground level release height of 2 meters (6.6 feet) was used for each area source. All of the emissions from the construction equipment and construction truck travel were included in the area sources. Emissions were modeled as occurring daily between 7 a.m. to 4 p.m. when the majority of the construction activity involving equipment usage would occur. The model used a 5-year data set (2006-2010) of hourly meteorological data from the San José International Airport prepared by the BAAQMD for use with the AERMOD model. The airport is located about 11 miles northwest of the project site.

Average annual DPM concentrations from construction activities were calculated for each year of construction (2016 – 2020) based on the 5 years of meteorological data. DPM concentrations were calculated at off-site sensitive receptors at a height of 1.5 meters (4.9 feet). The locations of the maximum-modeled concentrations are identified on Figure 2.

Based on the maximum modeled DPM and $PM_{2.5}$ concentrations, maximum increased cancer risks and non-cancer health impacts were calculated using BAAQMD recommended methods, as described in *Attachment 3*. Table 8 summarizes cancer risk, hazards and annual $PM_{2.5}$ concentrations at the maximally affected off-site sensitive receptor (residence).

Table 8. Data Center Construction - Maximum Increased Cancer Risk, Hazards and $PM_{2.5}$

Sensitive Receptor	Cancer Risk (per million)	$PM_{2.5}$ Concentration ($\mu g/m^3$)	Hazard Index (HI)
Off-Site Residence	4.5	0.02	<0.1
BAAQMD Thresholds	*10.0*	*0.3*	*1.0*

Results of this assessment indicate that the maximum off-site residential infant/child cancer risk is 4.5 in one million and the residential adult cancer risk is 0.1 in one million. These cancer risks are below the BAAQMD's threshold used for evaluating cancer risk of 10 excess cancer cases per million. The location of the receptors with the maximum off-site increased cancer risks are identified on Figure 2. Cancer risks at other residential receptors would be lower than the maximum cancer risks identified above. The maximum modeled annual residential DPM concentration (i.e., from construction exhaust) was 0.0181 $\mu g/m^3$. The maximum computed HI based on this DPM concentration is 0.002, which is much lower than the BAAQMD significance criterion of a HI greater than 1.0. The maximum-modeled annual $PM_{2.5}$ concentration, which is based on combined exhaust and fugitive dust emissions, was 0.02 $\mu g/m^3$. Therefore, annual $PM_{2.5}$ concentration would not exceed the BAAQMD significance threshold of 0.3 $\mu g/m^3$. *Attachment 4* includes the emission calculations used for the data center construction area source modeling and the cancer risk calculations, including the CalEEMod output.

Data Center Operation Health Impacts

Since the proposed project would emit DPM from the generator engines, an analysis was performed to assess what ambient concentrations would result from their operation and to quantify potential health risks at nearby sensitive receptors.

Potential health impacts from operation of the project's generators for testing and maintenance purposes and annual load testing were evaluated using air quality dispersion modeling and applying BAAQMD recommended health impact calculation methods, as described in *Attachment 3*. DPM concentrations and potential cancer risks from operation of the generators were evaluated at existing residences in the nearby project vicinity of the proposed data center site. Figure 2 shows the proposed data center buildings and locations of project emergency generators at the Xilinx site and the receptors used to represent the locations of off-site residential receptors. The closest receptors to the proposed generators are about 750 feet south of the emergency generators for the SV-12 data center. The maximum average annual off-site DPM concentrations were used to calculate potential increased cancer risks from the project. Average annual DPM concentrations were used as being representative of long-term (30-year) exposures for calculation of cancer risks.

Figure 2. Data Center Emission Sources, Sensitive Receptor Locations, and Locations of Maximum TAC Impact from Data Center Construction and Operation

Air quality modeling of annual average DPM concentrations was conducted using the EPA's AERMOD dispersion model. The AERMOD model is a steady-state, multiple-source, dispersion model designed to calculate pollutant concentrations from single or multiple sources. The model is recommended by BAAQMD for predicting air pollutant/contaminant concentrations associated with various emissions sources. The AERMOD model predicts pollutant concentrations at receptors located in areas of flat or complex terrain from a variety of emission source types including point, area, volume and line sources. Since there are minimal elevation differences in the topography in the vicinity of the project site, flat terrain was assumed. The land use classification of the area was assumed to be urban. The modeling used a five-year data set (2006 - 2010) of hourly meteorological data from the San Jose Airport that was prepared by BAAQMD for use with the AERMOD model.

Annual average DPM and $PM_{2.5}$ concentrations were modeled assuming that generator testing would occur between the hours of 8:00 AM and 5:00 PM and each generator is operated for 16 hours per year. The SV-12, SV-13, and SV-14 generator engine source parameters used in the modeling are listed in Table 2. DPM emissions for the proposed emergency generators were calculated based on manufacturer's particulate matter emission factor data (Cummins Power Generation) for the generator engines exhaust and engine load specific operational data. As a worst-case analysis, each generator was assumed to operate at full load for 50 hours per year, even though the testing schedule indicates less operation at lower engine loads. The generator emission calculations and a copy of the manufacturer's engine performance and emissions data are included in *Attachment 5*.

DPM and $PM_{2.5}$ concentrations were calculated at the locations of existing nearby residences, as shown in Figure 2. The same receptor locations used to evaluate construction impacts, discussed above, were used for evaluating impacts from the proposed emergency generators. Annual DPM and $PM_{2.5}$ concentrations from project operation were calculated at receptor heights of 1.5 meters (4.9 feet).

The maximum modeled annual DPM concentration from operation of the generators at SV-12, SV-13, and SV-14 was 0.0022 $\mu g/m^3$ at a receptor south of the data center project site across Santa Teresa Boulevard. DPM concentrations at all other existing residential locations would be lower then the maximum concentration. The location of the maximum modeled DPM concentration, and TAC impacts, are shown on Figure 2.

Based on the maximum modeled DPM and $PM_{2.5}$ concentrations, maximum increased cancer risks and non-cancer health impacts were calculated using BAAQMD recommended methods, as described in *Attachment 3*. Table 9 shows the maximum predicted community risk levels from the operation of the proposed emergency generators at SV-12, SV-13, and SV-14.

Table 9. Data Center Operation - Maximum Increased Community Risk Levels

Sensitive Receptor	Cancer Risk (per million)	Maximum Annual $PM_{2.5}$ ($\mu g/m^3$)	Maximum Hazard Index
Off-Site Residence	1.6	< 0.01	< 0.01
BAAQMD Single Source Threshold	*10.0*	*0.3*	*1.0*
Significant?	*No*	*No*	*No*

The maximum increased cancer risks, maximum modeled annual $PM_{2.5}$ concentration, and maximum hazard index from operation of the proposed emergency generators would be below the BAAQMD significance thresholds, and would be considered a *less than significant impact*. Details of the modeling and cancer risk calculations are included in *Attachment 5*.

Data Center Total Health Impacts From Construction and Operation

The total increased cancer risk and non-cancer health impacts from construction and operation of the proposed Xilinx data center are summarized in Table 10. Total cancer risks and non-cancer health impacts from construction and operation of the proposed Xilinx data center would be below applicable BAAQMD significance thresholds and would be considered a *less than significant impact*.

Table 10. Data Center Construction and Operation – Total Maximum Health Impacts

Impact Type	Cancer Risk (per million)	Maximum Annual $PM_{2.5}$ ($\mu g/m^3$)	Maximum Hazard Index
Total Construction and Operation Impacts	6.1	< 0.03	< 0.01
BAAQMD Single Source Threshold	*10.0*	*0.3*	*1.0*
Significant?	*No*	*No*	*No*

Community Risk – Santa Teresa Substation Health Risk and Hazards

Santa Teresa Substation Construction Health Impacts

Construction of the Santa Teresa Substation would expose sensitive receptors in the project area to DPM from construction related activities. Sensitive receptors in the proposed substation area are the existing nearby off-site residences. The closest sensitive receptors are residences on Autotech Driver and Cheryl Beck Drive west of the substation site. A health risk assessment of the substation construction activities was conducted that evaluated potential health effects at nearby sensitive receptors from construction DPM emissions. A dispersion model was used to predict the off-site concentrations resulting from project construction so that lifetime cancer risks could be predicted. Figure 3 shows the project site and sensitive receptor locations (residences) used in the air quality dispersion modeling analysis where potential health impacts were evaluated.

Construction period emissions were computed using CalEEMod along with projected construction activity, as previously described. The number and types of construction equipment and diesel vehicles, along with the anticipated length of their use for different phases of construction, were based on a site-specific construction schedule. Construction of the substation and distribution feeders is expected to occur over an approximate two-year period starting in 2018. The CalEEMod model provided annual $PM_{2.5}$ exhaust emissions (assumed to be DPM) for each year of construction for the off road construction equipment used and for the exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles). The total DPM emissions over the entire construction period were calculated as 0.0134 tons (27 pounds). A trip length of one-half mile was used to represent vehicle travel while at or near the construction site. For modeling purposes, it was assumed that these emissions from on-road vehicles would occur at the construction site. Fugitive dust $PM_{2.5}$ emissions were also computed and included in this analysis. The model predicts total construction period emissions of 0.0168 tons (34 pounds) of fugitive $PM_{2.5}$.

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM at existing off-site sensitive receptors in the vicinity of the substation construction site. The dispersion modeling utilized two area sources to represent the on-site construction emissions, one for DPM exhaust emissions and the other for fugitive $PM_{2.5}$ dust emissions. To represent the construction equipment exhaust emissions, an emission release height of 6 meters (19.7 feet) was used for the area source. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases. For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of 2 meters (6.6 feet) was used for the area source. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources. All of the emissions from the construction equipment and construction truck travel were included in the area sources. Emissions were modeled as occurring daily between 7 a.m. to 4 p.m. when the majority of the construction activity involving equipment usage would occur. The model used a 5-year data set (2006-2010) of hourly meteorological data from the San José International Airport prepared by the BAAQMD for use with the AERMOD model.

Average annual DPM concentrations from construction activities were calculated for each year of construction (2018 - 2019) based on the 5 years of meteorological data. DPM concentrations were calculated at off-site sensitive receptors at a height of 1.5 meters (4.9 feet). The locations of the maximum-modeled concentrations are identified on Figure 3.

Based on the maximum modeled DPM and $PM_{2.5}$ concentrations, maximum increased cancer risks and non-cancer health impacts were calculated using BAAQMD recommended methods, as described in *Attachment 3*. Table 11 summarizes cancer risk, hazards and annual $PM_{2.5}$ concentrations at the maximally affected off-site sensitive receptor (residence).

Table 11. Substation Construction - Maximum Increased Cancer Risk, Hazards and $PM_{2.5}$

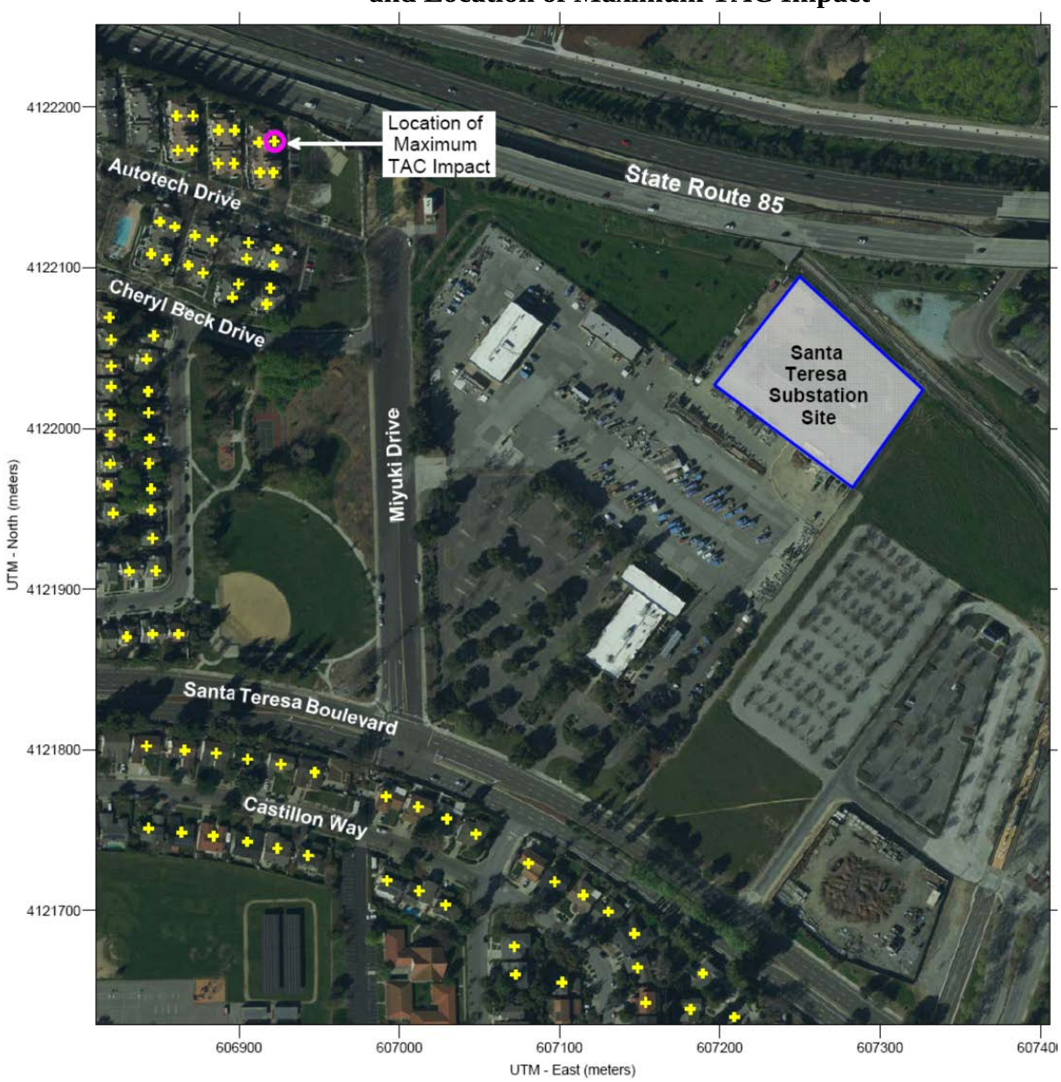
Sensitive Receptor	Cancer Risk (per million)	$PM_{2.5}$ Concentration ($\mu g/m^3$)	Hazard Index (HI)
Off-Site Residence	0.1	<0.1	<0.1
BAAQMD Thresholds	*10.0*	*0.3*	*1.0*

Results of this assessment indicate that the maximum increased cancer risks and non-cancer health impacts from construction of the proposed Santa Teresa Substation would be well below applicable BAAQMD significance thresholds and would be considered a *less than significant impact*. Details of the modeling and cancer risk calculations are included in *Attachment 4*.

Substation Operation Health Impacts

Operation of the proposed Santa Teresa Substation would not result in significant operational emissions. Operational emissions from the substation were assumed to be insignificant.

Figure 3. Santa Teresa Substation Emission Sources, Sensitive Receptor Locations, and Location of Maximum TAC Impact



Cumulative Operational TAC Exposure

The project site is affected by several sources of TACs. Table 12 shows the cancer risk, hazard index, and $PM_{2.5}$ concentrations associated with each source affecting the project site. The sum of impacts from cumulative sources (i.e., sources within 1,000 feet of the project) would be below the thresholds used by BAAQMD. Note that impacts to off-site sensitive receptors would be less than those to on-site receptors that are closer to the project and the freeway. The Stationary Source Information Form and screening risk calculations used to assess these sources are provided in *Attachment 5* as part of the operational risk modeling information.

Table 12. Impacts from Cumulative Sources – On-Site Receptors

Sources within 1,000 feet of Project Site	Maximum Cancer Risk (per million)[1]	Maximum Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)	Hazard Index (HI)
Project Impact	6.1	<0.03	<0.01
Santa Theresa Boulevard (NW-SE, 35 feet, ADT = 16,950) using Roadway Screening Calculator[2]	6.4	<0.24	<0.02
Plant No. 16518 Northrop Grumman Systems (2,200 feet)	Greater than 1,000 feet from receptor		
Plant No. 18592 – Berg and Berg (400-500 feet)	0.5	0.00	0.00
Plant No. 18254 – ISCS Inc. (1,400 feet)	Greater than 1,000 feet from receptor		
Plant No. 14947 – VA Venture (2,000 feet)	Greater than 1,000 feet from receptor		
Plant No. 19733 – Stion Corporation. (2,900 feet)	Greater than 1,000 feet from receptor		
Cumulative Sources	13.0	<0.27	0.2
BAAQMD Threshold – Cumulative Sources	***100***	***10.0***	***0.8***

Note: [1] Cumulative source cancer risk adjusted upward by factor of 1.3744 to account for new 2015 OEHHA guidance.
[2] Using BAAQMD Roadway Screening Calculator for east-west roadway, receptor 35 feet south and 16,950 ADT based on City of San Jose reported data for Santa Theresa Blvd leg south of San Ignacio Ave (see http://data.sanjoseca.gov/visualizations/26991/adt-traffic-volume-nodes/, accessed 6/15/2016)

Attachment 1: CalEEMod Construction Emissions Output

Equinix Xilinx, Site Work, TAC

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	573.00	1000sqft	18.00	573,000.00	0
Parking Lot	299.00	Space	0.00	79,220.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioxide Emission Intensity Standard

Land Use - From Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment -

Off-road Equipment -

Trips and VMT - For TAC, trip distance=0.5mile

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblLandUse	LandUseSquareFeet	119,600.00	79,220.00
tblLandUse	LotAcreage	13.15	18.00
tblLandUse	LotAcreage	2.69	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429
tblProjectCharacteristics	OperationalYear	2014	2018

2.0 Emissions Summary

2.1 Overall Construction

<u>Unmitigated Construction</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.1240	1.3974	0.9624	1.1600e-003	0.2240	0.0685	0.2925	0.1046	0.0630	0.1676	0.0000	108.8609	108.8609	0.0321	0.0000	109.5341
Total	**0.1240**	**1.3974**	**0.9624**	**1.1600e-003**	**0.2240**	**0.0685**	**0.2925**	**0.1046**	**0.0630**	**0.1676**	**0.0000**	**108.8609**	**108.8609**	**0.0321**	**0.0000**	**109.5341**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0360	0.9384	0.7060	1.1600e-003	0.1027	0.0255	0.1283	0.0243	0.0255	0.0498	0.0000	108.8607	108.8607	0.0321	0.0000	109.5340
Total	**0.0360**	**0.9384**	**0.7060**	**1.1600e-003**	**0.1027**	**0.0255**	**0.1283**	**0.0243**	**0.0255**	**0.0498**	**0.0000**	**108.8607**	**108.8607**	**0.0321**	**0.0000**	**109.5340**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**70.99**	**32.85**	**26.65**	**0.00**	**54.13**	**62.75**	**56.15**	**76.81**	**59.51**	**70.30**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	11/1/2016	11/14/2016	5	10	
2	Grading	Grading	11/15/2016	12/26/2016	5	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0254	0.2732	0.2055	2.0000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	18.4386	18.4386	5.5600e-003	0.0000	18.5554
Total	**0.0254**	**0.2732**	**0.2055**	**2.0000e-004**	**0.0903**	**0.0147**	**0.1050**	**0.0497**	**0.0135**	**0.0632**	**0.0000**	**18.4386**	**18.4386**	**5.5600e-003**	**0.0000**	**18.5554**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	4.7000e-004	4.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7220	0.7220	4.0000e-005	0.0000	0.7228
Total	**3.4000e-004**	**4.7000e-004**	**4.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7220**	**0.7220**	**4.0000e-005**	**0.0000**	**0.7228**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1500e-003	0.1721	0.1170	2.0000e-004		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	18.4385	18.4385	5.5600e-003	0.0000	18.5553
Total	**6.1500e-003**	**0.1721**	**0.1170**	**2.0000e-004**	**0.0407**	**4.8100e-003**	**0.0455**	**0.0112**	**4.8100e-003**	**0.0160**	**0.0000**	**18.4385**	**18.4385**	**5.5600e-003**	**0.0000**	**18.5553**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	4.7000e-004	4.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7220	0.7220	4.0000e-005	0.0000	0.7228
Total	**3.4000e-004**	**4.7000e-004**	**4.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7220**	**0.7220**	**4.0000e-005**	**0.0000**	**0.7228**

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0972	1.1222	0.7371	9.3000e-004		0.0538	0.0538		0.0495	0.0495	0.0000	87.2936	87.2936	0.0263	0.0000	87.8465
Total	**0.0972**	**1.1222**	**0.7371**	**9.3000e-004**	**0.1301**	**0.0538**	**0.1839**	**0.0540**	**0.0495**	**0.1034**	**0.0000**	**87.2936**	**87.2936**	**0.0263**	**0.0000**	**87.8465**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1200e-003	1.5700e-003	0.0153	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.5000e-004	0.0000	2.4067	2.4067	1.3000e-004	0.0000	2.4094
Total	**1.1200e-003**	**1.5700e-003**	**0.0153**	**3.0000e-005**	**2.7300e-003**	**2.0000e-005**	**2.7500e-003**	**7.3000e-004**	**2.0000e-005**	**7.5000e-004**	**0.0000**	**2.4067**	**2.4067**	**1.3000e-004**	**0.0000**	**2.4094**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0586	0.0000	0.0586	0.0121	0.0000	0.0121	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0284	0.7642	0.5692	9.3000e-004		0.0207	0.0207		0.0207	0.0207	0.0000	87.2935	87.2935	0.0263	0.0000	87.8464
Total	**0.0284**	**0.7642**	**0.5692**	**9.3000e-004**	**0.0586**	**0.0207**	**0.0792**	**0.0121**	**0.0207**	**0.0328**	**0.0000**	**87.2935**	**87.2935**	**0.0263**	**0.0000**	**87.8464**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1200e-003	1.5700e-003	0.0153	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.5000e-004	0.0000	2.4067	2.4067	1.3000e-004	0.0000	2.4094
Total	**1.1200e-003**	**1.5700e-003**	**0.0153**	**3.0000e-005**	**2.7300e-003**	**2.0000e-005**	**2.7500e-003**	**7.3000e-004**	**2.0000e-005**	**7.5000e-004**	**0.0000**	**2.4067**	**2.4067**	**1.3000e-004**	**0.0000**	**2.4094**

Xilinx Equinix, SV-12, TAC, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	191.00	1000sqft	2.93	191,000.00	0
Parking Lot	86.00	Space	0.00	22,786.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429.6	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioixde Emission Intensity

Land Use - From Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Trips and VMT - For TAC, trip lengths= 0.5 mile

Grading -

Architectural Coating -

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	NumDays	220.00	230.00
tblConstructionPhase	NumDays	6.00	20.00
tblConstructionPhase	NumDays	10.00	20.00
tblLandUse	LandUseSquareFeet	34,400.00	22,786.00
tblLandUse	LotAcreage	4.38	2.93
tblLandUse	LotAcreage	0.77	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2014	2018

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0574	0.4668	0.3947	6.3000e-004	0.0130	0.0290	0.0420	3.5100e-003	0.0272	0.0307	0.0000	55.1315	55.1315	0.0102	0.0000	55.3448
2017	1.4125	3.3272	2.9356	4.9100e-003	0.1107	0.2028	0.3135	0.0299	0.1903	0.2202	0.0000	422.9868	422.9868	0.0722	0.0000	424.5036
Total	**1.4699**	**3.7940**	**3.3303**	**5.5400e-003**	**0.1237**	**0.2318**	**0.3555**	**0.0334**	**0.2174**	**0.2508**	**0.0000**	**478.1183**	**478.1183**	**0.0824**	**0.0000**	**479.8484**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2016	0.0311	0.4061	0.3973	6.3000e-004	0.0130	0.0146	0.0276	3.5100e-003	0.0146	0.0181	0.0000	55.1315	55.1315	0.0102	0.0000	55.3448
2017	1.2319	3.0254	2.9677	4.9100e-003	0.1107	0.1089	0.2196	0.0299	0.1085	0.1384	0.0000	422.9864	422.9864	0.0722	0.0000	424.5033
Total	**1.2630**	**3.4315**	**3.3650**	**5.5400e-003**	**0.1237**	**0.1235**	**0.2472**	**0.0334**	**0.1230**	**0.1565**	**0.0000**	**478.1179**	**478.1179**	**0.0824**	**0.0000**	**479.8481**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**14.08**	**9.55**	**-1.04**	**0.00**	**0.00**	**46.70**	**30.46**	**0.00**	**43.42**	**37.63**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	11/1/2016	11/28/2016	5	20	
2	Building Construction	Building Construction	11/29/2016	10/16/2017	5	230	
3	Architectural Coating	Architectural Coating	10/17/2017	11/13/2017	5	20	
4	Paving	Paving	11/14/2017	12/11/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 287,525; Non-Residential Outdoor: 95,842 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	162	0.38
Grading	Graders	0	0.00	174	0.41
Grading	Rubber Tired Dozers	0	0.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	62	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving+C424	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	2	5.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	90.00	35.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2900e-003	0.0769	0.0584	8.0000e-005		4.6900e-003	4.6900e-003		4.3100e-003	4.3100e-003	0.0000	7.9251	7.9251	2.3900e-003	0.0000	7.9753
Total	**7.2900e-003**	**0.0769**	**0.0584**	**8.0000e-005**	**0.0000**	**4.6900e-003**	**4.6900e-003**	**0.0000**	**4.3100e-003**	**4.3100e-003**	**0.0000**	**7.9251**	**7.9251**	**2.3900e-003**	**0.0000**	**7.9753**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.6000e-004	2.5400e-003	1.0000e-005	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4011	0.4011	2.0000e-005	0.0000	0.4016
Total	**1.9000e-004**	**2.6000e-004**	**2.5400e-003**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.4011**	**0.4011**	**2.0000e-005**	**0.0000**	**0.4016**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5200e-003	0.0753	0.0636	8.0000e-005		2.6100e-003	2.6100e-003		2.6100e-003	2.6100e-003	0.0000	7.9251	7.9251	2.3900e-003	0.0000	7.9753
Total	**3.5200e-003**	**0.0753**	**0.0636**	**8.0000e-005**	**0.0000**	**2.6100e-003**	**2.6100e-003**	**0.0000**	**2.6100e-003**	**2.6100e-003**	**0.0000**	**7.9251**	**7.9251**	**2.3900e-003**	**0.0000**	**7.9753**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.6000e-004	2.5400e-003	1.0000e-005	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4011	0.4011	2.0000e-005	0.0000	0.4016
Total	**1.9000e-004**	**2.6000e-004**	**2.5400e-003**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.4011**	**0.4011**	**2.0000e-005**	**0.0000**	**0.4016**

3.3 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0409	0.3421	0.2221	3.2000e-004		0.0236	0.0236		0.0222	0.0222	0.0000	29.0584	29.0584	7.2100e-003	0.0000	29.2098
Total	**0.0409**	**0.3421**	**0.2221**	**3.2000e-004**		**0.0236**	**0.0236**		**0.0222**	**0.0222**	**0.0000**	**29.0584**	**29.0584**	**7.2100e-003**	**0.0000**	**29.2098**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.9900e-003	0.0419	0.0568	1.0000e-004	2.7100e-003	6.3000e-004	3.3400e-003	7.8000e-004	5.8000e-004	1.3600e-003	0.0000	9.0827	9.0827	7.0000e-005	0.0000	9.0843
Worker	4.0200e-003	5.6500e-003	0.0549	1.1000e-004	9.8300e-003	8.0000e-005	9.9100e-003	2.6100e-003	7.0000e-005	2.6900e-003	0.0000	8.6641	8.6641	4.6000e-004	0.0000	8.6739
Total	**9.0100e-003**	**0.0476**	**0.1117**	**2.1000e-004**	**0.0125**	**7.1000e-004**	**0.0133**	**3.3900e-003**	**6.5000e-004**	**4.0500e-003**	**0.0000**	**17.7469**	**17.7469**	**5.3000e-004**	**0.0000**	**17.7581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0184	0.2829	0.2195	3.2000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	29.0584	29.0584	7.2100e-003	0.0000	29.2097
Total	**0.0184**	**0.2829**	**0.2195**	**3.2000e-004**		**0.0113**	**0.0113**		**0.0113**	**0.0113**	**0.0000**	**29.0584**	**29.0584**	**7.2100e-003**	**0.0000**	**29.2097**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.9900e-003	0.0419	0.0568	1.0000e-004	2.7100e-003	6.3000e-004	3.3400e-003	7.8000e-004	5.8000e-004	1.3600e-003	0.0000	9.0827	9.0827	7.0000e-005	0.0000	9.0843
Worker	4.0200e-003	5.6500e-003	0.0549	1.1000e-004	9.8300e-003	8.0000e-005	9.9100e-003	2.6100e-003	7.0000e-005	2.6900e-003	0.0000	8.6641	8.6641	4.6000e-004	0.0000	8.6739
Total	**9.0100e-003**	**0.0476**	**0.1117**	**2.1000e-004**	**0.0125**	**7.1000e-004**	**0.0133**	**3.3900e-003**	**6.5000e-004**	**4.0500e-003**	**0.0000**	**17.7469**	**17.7469**	**5.3000e-004**	**0.0000**	**17.7581**

3.3 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3195	2.7198	1.8673	2.7600e-003		0.1835	0.1835		0.1723	0.1723	0.0000	246.6635	246.6635	0.0607	0.0000	247.9384
Total	**0.3195**	**2.7198**	**1.8673**	**2.7600e-003**		**0.1835**	**0.1835**		**0.1723**	**0.1723**	**0.0000**	**246.6635**	**246.6635**	**0.0607**	**0.0000**	**247.9384**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0375	0.3223	0.4491	8.6000e-004	0.0233	4.6600e-003	0.0279	6.6800e-003	4.2900e-003	0.0110	0.0000	76.6227	76.6227	5.9000e-004	0.0000	76.6351
Worker	0.0309	0.0435	0.4212	9.8000e-004	0.0844	6.4000e-004	0.0850	0.0224	5.9000e-004	0.0230	0.0000	71.5242	71.5242	3.6300e-003	0.0000	71.6004
Total	**0.0684**	**0.3658**	**0.8703**	**1.8400e-003**	**0.1077**	**5.3000e-003**	**0.1130**	**0.0291**	**4.8800e-003**	**0.0340**	**0.0000**	**148.1468**	**148.1468**	**4.2200e-003**	**0.0000**	**148.2356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1517	2.4217	1.8778	2.7600e-003		0.0955	0.0955		0.0955	0.0955	0.0000	246.6632	246.6632	0.0607	0.0000	247.9381
Total	**0.1517**	**2.4217**	**1.8778**	**2.7600e-003**		**0.0955**	**0.0955**		**0.0955**	**0.0955**	**0.0000**	**246.6632**	**246.6632**	**0.0607**	**0.0000**	**247.9381**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0375	0.3223	0.4491	8.6000e-004	0.0233	4.6600e-003	0.0279	6.6800e-003	4.2900e-003	0.0110	0.0000	76.6227	76.6227	5.9000e-004	0.0000	76.6351
Worker	0.0309	0.0435	0.4212	9.8000e-004	0.0844	6.4000e-004	0.0850	0.0224	5.9000e-004	0.0230	0.0000	71.5242	71.5242	3.6300e-003	0.0000	71.6004
Total	**0.0684**	**0.3658**	**0.8703**	**1.8400e-003**	**0.1077**	**5.3000e-003**	**0.1130**	**0.0291**	**4.8800e-003**	**0.0340**	**0.0000**	**148.1468**	**148.1468**	**4.2200e-003**	**0.0000**	**148.2356**

3.4 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9100e-003	0.0372	0.0357	6.0000e-005		2.5900e-003	2.5900e-003		2.5700e-003	2.5700e-003	0.0000	4.9368	4.9368	8.3000e-004	0.0000	4.9543
Total	**1.0044**	**0.0372**	**0.0357**	**6.0000e-005**		**2.5900e-003**	**2.5900e-003**		**2.5700e-003**	**2.5700e-003**	**0.0000**	**4.9368**	**4.9368**	**8.3000e-004**	**0.0000**	**4.9543**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-004	8.4000e-004	8.1800e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3888	1.3888	7.0000e-005	0.0000	1.3903
Total	**6.0000e-004**	**8.4000e-004**	**8.1800e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6500e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3888**	**1.3888**	**7.0000e-005**	**0.0000**	**1.3903**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-003	0.0394	0.0352	6.0000e-005		1.5500e-003	1.5500e-003		1.5300e-003	1.5300e-003	0.0000	4.9368	4.9368	8.3000e-004	0.0000	4.9542
Total	**1.0015**	**0.0394**	**0.0352**	**6.0000e-005**		**1.5500e-003**	**1.5500e-003**		**1.5300e-003**	**1.5300e-003**	**0.0000**	**4.9368**	**4.9368**	**8.3000e-004**	**0.0000**	**4.9542**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category						tons/yr								MT/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-004	8.4000e-004	8.1800e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3888	1.3888	7.0000e-005	0.0000	1.3903
Total	**6.0000e-004**	**8.4000e-004**	**8.1800e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6500e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3888**	**1.3888**	**7.0000e-005**	**0.0000**	**1.3903**

3.5 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						tons/yr								MT/yr		
Off-Road	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8266
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0191**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8266**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						tons/yr								MT/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	7.0000e-004	6.8200e-003	2.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1574	1.1574	6.0000e-005	0.0000	1.1586
Total	**5.0000e-004**	**7.0000e-004**	**6.8200e-003**	**2.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1574**	**1.1574**	**6.0000e-005**	**0.0000**	**1.1586**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						tons/yr								MT/yr		
Off-Road	9.1200e-003	0.1970	0.1693	2.2000e-004		6.5400e-003	6.5400e-003		6.5400e-003	6.5400e-003	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8265
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.1200e-003**	**0.1970**	**0.1693**	**2.2000e-004**		**6.5400e-003**	**6.5400e-003**		**6.5400e-003**	**6.5400e-003**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8265**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	7.0000e-004	6.8200e-003	2.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1574	1.1574	6.0000e-005	0.0000	1.1586
Total	**5.0000e-004**	**7.0000e-004**	**6.8200e-003**	**2.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1574**	**1.1574**	**6.0000e-005**	**0.0000**	**1.1586**

SV13, TAC, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	191.00	1000sqft	2.93	191,000.00	0
Parking Lot	86.00	Space	0.00	22,786.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 58

Climate Zone 4 **Operational Year** 2018

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 429.6 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioxide Emission Intensity

Land Use - From the Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Trips and VMT -

Grading -

Architectural Coating -

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	NumDays	220.00	230.00
tblConstructionPhase	NumDays	6.00	20.00
tblConstructionPhase	NumDays	10.00	20.00
tblLandUse	LandUseSquareFeet	34,400.00	22,786.00
tblLandUse	LotAcreage	4.38	2.93
tblLandUse	LotAcreage	0.77	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2014	2018

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	4.8700e-003	0.0496	0.0423	6.0000e-005	3.2000e-004	2.9900e-003	3.3100e-003	8.0000e-005	2.7500e-003	2.8300e-003	0.0000	5.7283	5.7283	1.6900e-003	0.0000	5.7637
2018	1.3861	3.1395	3.0087	5.2900e-003	0.1223	0.1829	0.3053	0.0331	0.1719	0.2050	0.0000	447.2564	447.2564	0.0742	0.0000	448.8143
2019	0.0110	0.1125	0.1119	1.8000e-004	1.0200e-003	6.0800e-003	7.1000e-003	2.7000e-004	5.5900e-003	5.8600e-003	0.0000	15.8352	15.8352	4.7900e-003	0.0000	15.9358
Total	**1.4020**	**3.3015**	**3.1629**	**5.5300e-003**	**0.1237**	**0.1920**	**0.3157**	**0.0334**	**0.1803**	**0.2137**	**0.0000**	**468.8198**	**468.8198**	**0.0807**	**0.0000**	**470.5139**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2017	2.5800e-003	0.0529	0.0461	6.0000e-005	3.2000e-004	1.8300e-003	2.1400e-003	8.0000e-005	1.8300e-003	1.9100e-003	0.0000	5.7283	5.7283	1.6900e-003	0.0000	5.7637
2018	1.2370	3.1778	3.0907	5.2900e-003	0.1223	0.1144	0.2367	0.0331	0.1139	0.1470	0.0000	447.2560	447.2560	0.0742	0.0000	448.8140
2019	7.1500e-003	0.1482	0.1311	1.8000e-004	1.0200e-003	4.9100e-003	5.9400e-003	2.7000e-004	4.9100e-003	5.1900e-003	0.0000	15.8352	15.8352	4.7900e-003	0.0000	15.9358
Total	**1.2467**	**3.3788**	**3.2679**	**5.5300e-003**	**0.1237**	**0.1211**	**0.2448**	**0.0334**	**0.1207**	**0.1541**	**0.0000**	**468.8195**	**468.8195**	**0.0807**	**0.0000**	**470.5135**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**11.08**	**-2.34**	**-3.32**	**0.00**	**0.00**	**36.91**	**22.45**	**0.00**	**33.05**	**27.88**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/12/2017	1/8/2018	5	20	
2	Building Construction	Building Construction	1/9/2018	11/26/2018	5	230	
3	Architectural Coating	Architectural Coating	11/27/2018	12/24/2018	5	20	
4	Paving	Paving	12/25/2018	1/21/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 287,525; Non-Residential Outdoor: 95,842 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	162	0.38
Grading	Graders	0	0.00	174	0.41
Grading	Rubber Tired Dozers	0	0.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	62	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	2	5.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	90.00	35.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Paving		6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7500e-003	0.0494	0.0407	6.0000e-005		2.9900e-003	2.9900e-003		2.7500e-003	2.7500e-003	0.0000	5.4583	5.4583	1.6700e-003	0.0000	5.4934
Total	**4.7500e-003**	**0.0494**	**0.0407**	**6.0000e-005**	**0.0000**	**2.9900e-003**	**2.9900e-003**	**0.0000**	**2.7500e-003**	**2.7500e-003**	**0.0000**	**5.4583**	**5.4583**	**1.6700e-003**	**0.0000**	**5.4934**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	1.6000e-004	1.5900e-003	0.0000	3.2000e-004	0.0000	3.2000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	0.2701	0.2701	1.0000e-005	0.0000	0.2703
Total	**1.2000e-004**	**1.6000e-004**	**1.5900e-003**	**0.0000**	**3.2000e-004**	**0.0000**	**3.2000e-004**	**8.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2701**	**0.2701**	**1.0000e-005**	**0.0000**	**0.2703**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4600e-003	0.0527	0.0445	6.0000e-005		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003	0.0000	5.4582	5.4582	1.6700e-003	0.0000	5.4934
Total	**2.4600e-003**	**0.0527**	**0.0445**	**6.0000e-005**	**0.0000**	**1.8200e-003**	**1.8200e-003**	**0.0000**	**1.8200e-003**	**1.8200e-003**	**0.0000**	**5.4582**	**5.4582**	**1.6700e-003**	**0.0000**	**5.4934**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					tons/yr									MT/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	1.6000e-004	1.5900e-003	0.0000	3.2000e-004	0.0000	3.2000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	0.2701	0.2701	1.0000e-005	0.0000	0.2703
Total	**1.2000e-004**	**1.6000e-004**	**1.5900e-003**	**0.0000**	**3.2000e-004**	**0.0000**	**3.2000e-004**	**8.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2701**	**0.2701**	**1.0000e-005**	**0.0000**	**0.2703**

3.2 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					tons/yr									MT/yr		
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6900e-003	0.0174	0.0171	3.0000e-005		1.0200e-003	1.0200e-003		9.4000e-004	9.4000e-004	0.0000	2.3011	2.3011	7.2000e-004	0.0000	2.3162
Total	**1.6900e-003**	**0.0174**	**0.0171**	**3.0000e-005**	**0.0000**	**1.0200e-003**	**1.0200e-003**	**0.0000**	**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.3011**	**2.3011**	**7.2000e-004**	**0.0000**	**2.3162**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					tons/yr									MT/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	6.0000e-005	6.1000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1114	0.1114	1.0000e-005	0.0000	0.1115
Total	**4.0000e-005**	**6.0000e-005**	**6.1000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1114**	**0.1114**	**1.0000e-005**	**0.0000**	**0.1115**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					tons/yr									MT/yr		
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0600e-003	0.0226	0.0191	3.0000e-005		7.8000e-004	7.8000e-004		7.8000e-004	7.8000e-004	0.0000	2.3011	2.3011	7.2000e-004	0.0000	2.3162
Total	**1.0600e-003**	**0.0226**	**0.0191**	**3.0000e-005**	**0.0000**	**7.8000e-004**	**7.8000e-004**	**0.0000**	**7.8000e-004**	**7.8000e-004**	**0.0000**	**2.3011**	**2.3011**	**7.2000e-004**	**0.0000**	**2.3162**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	6.0000e-005	6.1000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1114	0.1114	1.0000e-005	0.0000	0.1115
Total	**4.0000e-005**	**6.0000e-005**	**6.1000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1114**	**0.1114**	**1.0000e-005**	**0.0000**	**0.1115**

3.3 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.6750	2.0163	3.0800e-003		0.1718	0.1718		0.1616	0.1616	0.0000	272.2851	272.2851	0.0666	0.0000	273.6844
Total	**0.3069**	**2.6750**	**2.0163**	**3.0800e-003**		**0.1718**	**0.1718**		**0.1616**	**0.1616**	**0.0000**	**272.2851**	**272.2851**	**0.0666**	**0.0000**	**273.6844**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0379	0.3257	0.4723	9.5000e-004	0.0260	4.8200e-003	0.0308	7.4500e-003	4.4300e-003	0.0119	0.0000	84.0545	84.0545	6.5000e-004	0.0000	84.0681
Worker	0.0310	0.0437	0.4219	1.0900e-003	0.0942	7.0000e-004	0.0949	0.0251	6.4000e-004	0.0257	0.0000	76.8837	76.8837	3.7300e-003	0.0000	76.9620
Total	**0.0689**	**0.3694**	**0.8942**	**2.0400e-003**	**0.1202**	**5.5200e-003**	**0.1257**	**0.0325**	**5.0700e-003**	**0.0376**	**0.0000**	**160.9382**	**160.9382**	**4.3800e-003**	**0.0000**	**161.0301**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1626	2.6971	2.0904	3.0800e-003		0.1050	0.1050		0.1050	0.1050	0.0000	272.2848	272.2848	0.0666	0.0000	273.6841
Total	**0.1626**	**2.6971**	**2.0904**	**3.0800e-003**		**0.1050**	**0.1050**		**0.1050**	**0.1050**	**0.0000**	**272.2848**	**272.2848**	**0.0666**	**0.0000**	**273.6841**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0379	0.3257	0.4723	9.5000e-004	0.0260	4.8200e-003	0.0308	7.4500e-003	4.4300e-003	0.0119	0.0000	84.0545	84.0545	6.5000e-004	0.0000	84.0681
Worker	0.0310	0.0437	0.4219	1.0900e-003	0.0942	7.0000e-004	0.0949	0.0251	6.4000e-004	0.0257	0.0000	76.8837	76.8837	3.7300e-003	0.0000	76.9620
Total	**0.0689**	**0.3694**	**0.8942**	**2.0400e-003**	**0.1202**	**5.5200e-003**	**0.1257**	**0.0325**	**5.0700e-003**	**0.0376**	**0.0000**	**160.9382**	**160.9382**	**4.3800e-003**	**0.0000**	**161.0301**

3.4 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4000e-003	0.0337	0.0355	6.0000e-005		2.2000e-003	2.2000e-003		2.1900e-003	2.1900e-003	0.0000	4.9127	4.9127	7.9000e-004	0.0000	4.9293
Total	**1.0039**	**0.0337**	**0.0355**	**6.0000e-005**		**2.2000e-003**	**2.2000e-003**		**2.1900e-003**	**2.1900e-003**	**0.0000**	**4.9127**	**4.9127**	**7.9000e-004**	**0.0000**	**4.9293**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	7.6000e-004	7.3400e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3371	1.3371	6.0000e-005	0.0000	1.3385
Total	**5.4000e-004**	**7.6000e-004**	**7.3400e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6500e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3371**	**1.3371**	**6.0000e-005**	**0.0000**	**1.3385**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9300e-003	0.0384	0.0352	6.0000e-005		1.4600e-003	1.4600e-003		1.4500e-003	1.4500e-003	0.0000	4.9126	4.9126	7.9000e-004	0.0000	4.9293
Total	**1.0014**	**0.0384**	**0.0352**	**6.0000e-005**		**1.4600e-003**	**1.4600e-003**		**1.4500e-003**	**1.4500e-003**	**0.0000**	**4.9126**	**4.9126**	**7.9000e-004**	**0.0000**	**4.9293**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	7.6000e-004	7.3400e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3371	1.3371	6.0000e-005	0.0000	1.3385
Total	**5.4000e-004**	**7.6000e-004**	**7.3400e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6500e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3371**	**1.3371**	**6.0000e-005**	**0.0000**	**1.3385**

3.5 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.0300e-003	0.0429	0.0362	6.0000e-005		2.3500e-003	2.3500e-003		2.1600e-003	2.1600e-003	0.0000	5.0922	5.0922	1.5900e-003	0.0000	5.1255
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.0300e-003**	**0.0429**	**0.0362**	**6.0000e-005**		**2.3500e-003**	**2.3500e-003**		**2.1600e-003**	**2.1600e-003**	**0.0000**	**5.0922**	**5.0922**	**1.5900e-003**	**0.0000**	**5.1255**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	1.6000e-004	1.5300e-003	0.0000	3.4000e-004	0.0000	3.4000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2786	0.2786	1.0000e-005	0.0000	0.2789
Total	**1.1000e-004**	**1.6000e-004**	**1.5300e-003**	**0.0000**	**3.4000e-004**	**0.0000**	**3.4000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2786**	**0.2786**	**1.0000e-005**	**0.0000**	**0.2789**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2800e-003	0.0493	0.0423	6.0000e-005		1.6400e-003	1.6400e-003		1.6400e-003	1.6400e-003	0.0000	5.0922	5.0922	1.5900e-003	0.0000	5.1255
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.2800e-003**	**0.0493**	**0.0423**	**6.0000e-005**		**1.6400e-003**	**1.6400e-003**		**1.6400e-003**	**1.6400e-003**	**0.0000**	**5.0922**	**5.0922**	**1.5900e-003**	**0.0000**	**5.1255**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	1.6000e-004	1.5300e-003	0.0000	3.4000e-004	0.0000	3.4000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2786	0.2786	1.0000e-005	0.0000	0.2789
Total	**1.1000e-004**	**1.6000e-004**	**1.5300e-003**	**0.0000**	**3.4000e-004**	**0.0000**	**3.4000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2786**	**0.2786**	**1.0000e-005**	**0.0000**	**0.2789**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0107	0.1120	0.1077	1.7000e-004		6.0700e-003	6.0700e-003		5.5900e-003	5.5900e-003	0.0000	15.0296	15.0296	4.7600e-003	0.0000	15.1295
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0107**	**0.1120**	**0.1077**	**1.7000e-004**		**6.0700e-003**	**6.0700e-003**		**5.5900e-003**	**5.5900e-003**	**0.0000**	**15.0296**	**15.0296**	**4.7600e-003**	**0.0000**	**15.1295**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	4.3000e-004	4.1700e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8056	0.8056	4.0000e-005	0.0000	0.8064
Total	**3.1000e-004**	**4.3000e-004**	**4.1700e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8056**	**0.8056**	**4.0000e-005**	**0.0000**	**0.8064**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.8400e-003	0.1478	0.1270	1.7000e-004		4.9100e-003	4.9100e-003		4.9100e-003	4.9100e-003	0.0000	15.0296	15.0296	4.7600e-003	0.0000	15.1294
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.8400e-003**	**0.1478**	**0.1270**	**1.7000e-004**		**4.9100e-003**	**4.9100e-003**		**4.9100e-003**	**4.9100e-003**	**0.0000**	**15.0296**	**15.0296**	**4.7600e-003**	**0.0000**	**15.1294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	4.3000e-004	4.1700e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8056	0.8056	4.0000e-005	0.0000	0.8064
Total	**3.1000e-004**	**4.3000e-004**	**4.1700e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8056**	**0.8056**	**4.0000e-005**	**0.0000**	**0.8064**

SV14, TAC, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	191.00	1000sqft	3.29	191,000.00	0
Parking Lot	127.00	Space	0.00	33,648.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429.6	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioxide Emission intensity

Land Use - From the Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment -

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Trips and VMT - For TAC, trip distance = 0.5 miles

Grading -

Architectural Coating -

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	18.00	20.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	20.00
tblLandUse	LandUseSquareFeet	50,800.00	33,648.00
tblLandUse	LotAcreage	4.38	3.29
tblLandUse	LotAcreage	1.14	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2014	2018

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3356	2.7698	2.8516	5.2300e-003	0.1242	0.1535	0.2776	0.0336	0.1441	0.1777	0.0000	434.3170	434.3170	0.0710	0.0000	435.8077
2020	1.0243	0.2113	0.2383	4.1000e-004	5.2800e-003	0.0113	0.0166	1.4200e-003	0.0106	0.0120	0.0000	34.1839	34.1839	8.3700e-003	0.0000	34.3598
Total	**1.3599**	**2.9811**	**3.0899**	**5.6400e-003**	**0.1294**	**0.1648**	**0.2942**	**0.0350**	**0.1547**	**0.1897**	**0.0000**	**468.5009**	**468.5009**	**0.0794**	**0.0000**	**470.1675**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2218	3.0689	2.9723	5.2300e-003	0.1242	0.1096	0.2337	0.0336	0.1091	0.1427	0.0000	434.3166	434.3166	0.0710	0.0000	435.8074
2020	1.0168	0.2879	0.2667	4.1000e-004	5.2800e-003	9.8300e-003	0.0151	1.4200e-003	9.8100e-003	0.0112	0.0000	34.1839	34.1839	8.3700e-003	0.0000	34.3598
Total	**1.2386**	**3.3568**	**3.2390**	**5.6400e-003**	**0.1294**	**0.1194**	**0.2488**	**0.0350**	**0.1189**	**0.1539**	**0.0000**	**468.5005**	**468.5005**	**0.0794**	**0.0000**	**470.1671**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**8.92**	**-12.60**	**-4.82**	**0.00**	**0.00**	**27.56**	**15.43**	**0.00**	**23.13**	**18.86**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/22/2019	2/18/2019	5	20	
2	Building Construction	Building Construction	2/19/2019	1/6/2020	5	230	
3	Architectural Coating	Architectural Coating	1/7/2020	2/3/2020	5	20	
4	Paving	Paving	2/4/2020	3/2/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 288,014; Non-Residential Outdoor: 96,005 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	162	0.38
Grading	Graders	0	0.00	174	0.41
Grading	Rubber Tired Dozers	0	0.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	62	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	2	5.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	94.00	37.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	19.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.0000e-003	0.0509	0.0565	8.0000e-005		2.8900e-003	2.8900e-003		2.6600e-003	2.6600e-003	0.0000	7.5442	7.5442	2.3900e-003	0.0000	7.5943
Total	**5.0000e-003**	**0.0509**	**0.0565**	**8.0000e-005**	**0.0000**	**2.8900e-003**	**2.8900e-003**	**0.0000**	**2.6600e-003**	**2.6600e-003**	**0.0000**	**7.5442**	**7.5442**	**2.3900e-003**	**0.0000**	**7.5943**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8500e-003	1.0000e-005	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3580	0.3580	2.0000e-005	0.0000	0.3584
Total	**1.4000e-004**	**1.9000e-004**	**1.8500e-003**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3580**	**0.3580**	**2.0000e-005**	**0.0000**	**0.3584**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5200e-003	0.0753	0.0636	8.0000e-005		2.6100e-003	2.6100e-003		2.6100e-003	2.6100e-003	0.0000	7.5442	7.5442	2.3900e-003	0.0000	7.5943
Total	**3.5200e-003**	**0.0753**	**0.0636**	**8.0000e-005**	**0.0000**	**2.6100e-003**	**2.6100e-003**	**0.0000**	**2.6100e-003**	**2.6100e-003**	**0.0000**	**7.5442**	**7.5442**	**2.3900e-003**	**0.0000**	**7.5943**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.9000e-004	1.8500e-003	1.0000e-005	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3580	0.3580	2.0000e-005	0.0000	0.3584
Total	**1.4000e-004**	**1.9000e-004**	**1.8500e-003**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3580**	**0.3580**	**2.0000e-005**	**0.0000**	**0.3584**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2657	2.3691	1.9346	3.0300e-003		0.1452	0.1452		0.1365	0.1365	0.0000	264.5587	264.5587	0.0644	0.0000	265.9105
Total	**0.2657**	**2.3691**	**1.9346**	**3.0300e-003**		**0.1452**	**0.1452**		**0.1365**	**0.1365**	**0.0000**	**264.5587**	**264.5587**	**0.0644**	**0.0000**	**265.9105**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0357	0.3089	0.4651	9.9000e-004	0.0270	4.6500e-003	0.0316	7.7400e-003	4.2800e-003	0.0120	0.0000	85.7938	85.7938	6.6000e-004	0.0000	85.8077
Worker	0.0291	0.0408	0.3935	1.1200e-003	0.0967	7.0000e-004	0.0974	0.0257	6.5000e-004	0.0264	0.0000	76.0622	76.0622	3.5500e-003	0.0000	76.1368
Total	**0.0648**	**0.3497**	**0.8587**	**2.1100e-003**	**0.1237**	**5.3500e-003**	**0.1291**	**0.0335**	**4.9300e-003**	**0.0384**	**0.0000**	**161.8560**	**161.8560**	**4.2100e-003**	**0.0000**	**161.9445**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1534	2.6437	2.0482	3.0300e-003		0.1016	0.1016		0.1016	0.1016	0.0000	264.5584	264.5584	0.0644	0.0000	265.9102
Total	**0.1534**	**2.6437**	**2.0482**	**3.0300e-003**		**0.1016**	**0.1016**		**0.1016**	**0.1016**	**0.0000**	**264.5584**	**264.5584**	**0.0644**	**0.0000**	**265.9102**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0357	0.3089	0.4651	9.9000e-004	0.0270	4.6500e-003	0.0316	7.7400e-003	4.2800e-003	0.0120	0.0000	85.7938	85.7938	6.6000e-004	0.0000	85.8077
Worker	0.0291	0.0408	0.3935	1.1200e-003	0.0967	7.0000e-004	0.0974	0.0257	6.5000e-004	0.0264	0.0000	76.0622	76.0622	3.5500e-003	0.0000	76.1368
Total	**0.0648**	**0.3497**	**0.8587**	**2.1100e-003**	**0.1237**	**5.3500e-003**	**0.1291**	**0.0335**	**4.9300e-003**	**0.0384**	**0.0000**	**161.8560**	**161.8560**	**4.2100e-003**	**0.0000**	**161.9445**

3.3 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.2200e-003	0.0382	0.0336	5.0000e-005		2.2300e-003	2.2300e-003		2.0900e-003	2.0900e-003	0.0000	4.6130	4.6130	1.1200e-003	0.0000	4.6366
Total	**4.2200e-003**	**0.0382**	**0.0336**	**5.0000e-005**		**2.2300e-003**	**2.2300e-003**		**2.0900e-003**	**2.0900e-003**	**0.0000**	**4.6130**	**4.6130**	**1.1200e-003**	**0.0000**	**4.6366**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0000e-004	4.6600e-003	7.9800e-003	2.0000e-005	4.8000e-004	7.0000e-005	5.5000e-004	1.4000e-004	7.0000e-005	2.0000e-004	0.0000	1.4837	1.4837	1.0000e-005	0.0000	1.4840
Worker	4.8000e-004	6.7000e-004	6.4200e-003	2.0000e-005	1.7100e-003	1.0000e-005	1.7200e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.2921	1.2921	6.0000e-005	0.0000	1.2934
Total	**1.0800e-003**	**5.3300e-003**	**0.0144**	**4.0000e-005**	**2.1900e-003**	**8.0000e-005**	**2.2700e-003**	**6.0000e-004**	**8.0000e-005**	**6.7000e-004**	**0.0000**	**2.7759**	**2.7759**	**7.0000e-005**	**0.0000**	**2.7774**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6300e-003	0.0467	0.0362	5.0000e-005		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003	0.0000	4.6130	4.6130	1.1200e-003	0.0000	4.6366
Total	**2.6300e-003**	**0.0467**	**0.0362**	**5.0000e-005**		**1.7700e-003**	**1.7700e-003**		**1.7700e-003**	**1.7700e-003**	**0.0000**	**4.6130**	**4.6130**	**1.1200e-003**	**0.0000**	**4.6366**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.0000e-004	4.6600e-003	7.9800e-003	2.0000e-005	4.8000e-004	7.0000e-005	5.5000e-004	1.4000e-004	7.0000e-005	2.0000e-004	0.0000	1.4837	1.4837	1.0000e-005	0.0000	1.4840
Worker	4.8000e-004	6.7000e-004	6.4200e-003	2.0000e-005	1.7100e-003	1.0000e-005	1.7200e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.2921	1.2921	6.0000e-005	0.0000	1.2934
Total	**1.0800e-003**	**5.3300e-003**	**0.0144**	**4.0000e-005**	**2.1900e-003**	**8.0000e-005**	**2.2700e-003**	**6.0000e-004**	**8.0000e-005**	**6.7000e-004**	**0.0000**	**2.7759**	**2.7759**	**7.0000e-005**	**0.0000**	**2.7774**

3.4 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0012					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6200e-003	0.0288	0.0352	6.0000e-005		1.6200e-003	1.6200e-003		1.6100e-003	1.6100e-003	0.0000	4.8562	4.8562	7.3000e-004	0.0000	4.8716
Total	**1.0048**	**0.0288**	**0.0352**	**6.0000e-005**		**1.6200e-003**	**1.6200e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**4.8562**	**4.8562**	**7.3000e-004**	**0.0000**	**4.8716**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	6.7000e-004	6.4900e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.3059	1.3059	6.0000e-005	0.0000	1.3071
Total	**4.8000e-004**	**6.7000e-004**	**6.4900e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.3059**	**1.3059**	**6.0000e-005**	**0.0000**	**1.3071**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0012					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9100e-003	0.0377	0.0352	6.0000e-005		1.4100e-003	1.4100e-003		1.4000e-003	1.4000e-003	0.0000	4.8562	4.8562	7.3000e-004	0.0000	4.8716
Total	**1.0031**	**0.0377**	**0.0352**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.4000e-003**	**1.4000e-003**	**0.0000**	**4.8562**	**4.8562**	**7.3000e-004**	**0.0000**	**4.8716**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	6.7000e-004	6.4900e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.3059	1.3059	6.0000e-005	0.0000	1.3071
Total	**4.8000e-004**	**6.7000e-004**	**6.4900e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.3059**	**1.3059**	**6.0000e-005**	**0.0000**	**1.3071**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0133	0.1378	0.1435	2.2000e-004		7.3900e-003	7.3900e-003		6.8000e-003	6.8000e-003	0.0000	19.6021	19.6021	6.3400e-003	0.0000	19.7352
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0133**	**0.1378**	**0.1435**	**2.2000e-004**		**7.3900e-003**	**7.3900e-003**		**6.8000e-003**	**6.8000e-003**	**0.0000**	**19.6021**	**19.6021**	**6.3400e-003**	**0.0000**	**19.7352**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	5.3000e-004	5.1200e-003	2.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.0310	1.0310	5.0000e-005	0.0000	1.0319
Total	**3.8000e-004**	**5.3000e-004**	**5.1200e-003**	**2.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.0310**	**1.0310**	**5.0000e-005**	**0.0000**	**1.0319**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1200e-003	0.1970	0.1693	2.2000e-004		6.5400e-003	6.5400e-003		6.5400e-003	6.5400e-003	0.0000	19.6020	19.6020	6.3400e-003	0.0000	19.7352
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.1200e-003**	**0.1970**	**0.1693**	**2.2000e-004**		**6.5400e-003**	**6.5400e-003**		**6.5400e-003**	**6.5400e-003**	**0.0000**	**19.6020**	**19.6020**	**6.3400e-003**	**0.0000**	**19.7352**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	5.3000e-004	5.1200e-003	2.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.0310	1.0310	5.0000e-005	0.0000	1.0319
Total	**3.8000e-004**	**5.3000e-004**	**5.1200e-003**	**2.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.0310**	**1.0310**	**5.0000e-005**	**0.0000**	**1.0319**

Xilinx Substation, TAC, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	65.34	1000sqft	2.10	65,340.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429.6	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised CO2 emission intensity

Land Use - From the presentation on Saint Teresa Sub Station

Construction Phase - Site Specific Construction Schedule

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Trips and VMT - For TAc, trip distances= 0.5 mile

Grading - 1800 cy export
8525 cy import

Construction Off-road Equipment Mitigation - Best Management Practices

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstEquipMitigation	Tier	No Change	Tier 2
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tblConstructionPhase	NumDays	6.00	40.00
tblConstructionPhase	NumDays	220.00	40.00

tblConstructionPhase	NumDays	220.00	40.00
tblConstructionPhase	NumDays	220.00	8.00
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	PhaseEndDate	11/30/2018	12/28/2018
tblConstructionPhase	PhaseEndDate	2/22/2019	1/4/2019
tblConstructionPhase	PhaseEndDate	3/1/2019	1/4/2019
tblConstructionPhase	PhaseEndDate	1/16/2019	11/28/2018
tblConstructionPhase	PhaseEndDate	11/30/2018	10/5/2018
tblConstructionPhase	PhaseEndDate	12/26/2018	2/1/2019
tblConstructionPhase	PhaseStartDate	9/8/2018	9/10/2018
tblConstructionPhase	PhaseStartDate	10/6/2018	11/3/2018
tblConstructionPhase	PhaseStartDate	12/29/2018	11/12/2018
tblConstructionPhase	PhaseStartDate	1/5/2019	11/12/2018
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tblConstructionPhase	PhaseStartDate	11/3/2018	9/10/2018
tblConstructionPhase	PhaseStartDate	11/29/2018	1/7/2019
tblGrading	MaterialExported	0.00	1,800.00
tblGrading	MaterialImported	0.00	8,525.00
tblLandUse	LotAcreage	1.50	2.10
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	UsageHours	8.00	0.00

tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
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tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2014	2020
tblTripsAndVMT	HaulingTripNumber	0.00	40.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0579	0.6080	0.5424	1.1300e-003	0.1466	0.0239	0.1705	0.0732	0.0220	0.0953	0.0000	99.0500	99.0500	0.0122	0.0000	99.3071
2019	3.6200e-003	0.0335	0.0367	7.0000e-005	1.8000e-003	1.8800e-003	3.6800e-003	4.8000e-004	1.7300e-003	2.2100e-003	0.0000	5.6987	5.6987	1.2200e-003	0.0000	5.7243
Total	**0.0616**	**0.6416**	**0.5791**	**1.2000e-003**	**0.1484**	**0.0258**	**0.1742**	**0.0737**	**0.0237**	**0.0975**	**0.0000**	**104.7487**	**104.7487**	**0.0135**	**0.0000**	**105.0314**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					

2018	0.0359	0.5223	0.4573	1.1300e-003	0.0800	0.0137	0.0937	0.0219	0.0131	0.0350	0.0000	99.0500	99.0500	0.0122	0.0000	99.3070
2019	3.2000e-003	0.0356	0.0369	7.0000e-005	1.8000e-003	1.7000e-003	3.5000e-003	4.8000e-004	1.6000e-003	2.0800e-003	0.0000	5.6987	5.6987	1.2200e-003	0.0000	5.7243
Total	**0.0391**	**0.5579**	**0.4942**	**1.2000e-003**	**0.0818**	**0.0154**	**0.0972**	**0.0224**	**0.0147**	**0.0370**	**0.0000**	**104.7487**	**104.7487**	**0.0135**	**0.0000**	**105.0313**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**36.44**	**13.05**	**14.65**	**0.00**	**44.86**	**40.45**	**44.21**	**69.68**	**38.12**	**62.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Relocation	Site Preparation	8/13/2018	9/7/2018	5	20	
2	Site Preparation	Site Preparation	9/10/2018	11/2/2018	5	40	
3	Paving	Paving	9/10/2018	10/5/2018	5	20	
4	Excavation	Grading	11/3/2018	12/28/2018	5	40	
5	Building Construction: Substation	Building Construction	11/12/2018	1/4/2019	5	40	
6	Building Construction: Distribution Line	Building Construction	11/12/2018	1/4/2019	5	40	
7	Building Construction: Overhead Lines	Building Construction	11/19/2018	11/28/2018	5	8	
8	Trenching	Trenching	1/7/2019	2/1/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Relocation	Concrete/Industrial Saws	0	0.00	81	0.73
Relocation	Forklifts	1	8.00	89	0.20
Relocation	Graders	0	0.00	174	0.41
Relocation	Rubber Tired Dozers	0	0.00	255	0.40
Relocation	Scrapers	0	0.00	361	0.48
Relocation	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Site Preparation	Graders	0	0.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	8.00	255	0.40
Site Preparation	Scrapers	0	0.00	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	0	0.00	125	0.42
Paving	Paving Equipment	0	0.00	130	0.36
Paving	Rollers	1	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction: Substation	Cranes	1	0.30	226	0.29
Building Construction: Distribution Line	Cranes	1	1.25	226	0.29
Building Construction: Overhead Lines	Cranes	0	0.00	226	0.29
Building Construction: Substation	Forklifts	1	3.00	89	0.20
Building Construction: Distribution Line	Forklifts	0	0.00	89	0.20
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction: Overhead Lines	Forklifts	0	0.00	89	0.20

Building Construction: Substation	Generator Sets	0	0.00	84	0.74
Building Construction: Distribution Line	Generator Sets	0	0.00	84	0.74
Building Construction: Overhead Lines	Generator Sets	0	0.00	84	0.74
Excavation	Graders	0	0.00	174	0.41
Excavation	Rubber Tired Dozers	0	0.00	255	0.40
Building Construction: Substation	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction: Distribution Line	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction: Overhead Lines	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Excavation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction: Substation	Welders	0	0.00	46	0.45
Building Construction: Distribution Line	Welders	0	0.00	46	0.45
Building Construction: Overhead Lines	Welders	0	0.00	46	0.45
Building Construction: Distribution Line	Bore/Drill Rigs	1	3.00	205	0.50
Building Construction: Overhead Lines	Bore/Drill Rigs	1	4.00	205	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Relocation	1	3.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	1	3.00	0.00	1,291.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	1	3.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction: Substation	2	27.00	11.00	40.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	1	3.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction: Distribution Line	2	27.00	11.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction: Overhead Lines	2	27.00	11.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Excavation	1	3.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Relocation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7800e-003	0.0157	0.0121	2.0000e-005		1.2600e-003	1.2600e-003		1.1600e-003	1.1600e-003	0.0000	1.3951	1.3951	4.3000e-004	0.0000	1.4043
Total	**1.7800e-003**	**0.0157**	**0.0121**	**2.0000e-005**	**0.0000**	**1.2600e-003**	**1.2600e-003**	**0.0000**	**1.1600e-003**	**1.1600e-003**	**0.0000**	**1.3951**	**1.3951**	**4.3000e-004**	**0.0000**	**1.4043**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	1.3000e-004	1.2200e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2229	0.2229	1.0000e-005	0.0000	0.2231
Total	**9.0000e-005**	**1.3000e-004**	**1.2200e-003**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2229**	**0.2229**	**1.0000e-005**	**0.0000**	**0.2231**

<u>Mitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2000e-004	0.0149	0.0116	2.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004	0.0000	1.3951	1.3951	4.3000e-004	0.0000	1.4043
Total	**7.2000e-004**	**0.0149**	**0.0116**	**2.0000e-005**	**0.0000**	**6.0000e-004**	**6.0000e-004**	**0.0000**	**6.0000e-004**	**6.0000e-004**	**0.0000**	**1.3951**	**1.3951**	**4.3000e-004**	**0.0000**	**1.4043**

<u>Mitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	1.3000e-004	1.2200e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2229	0.2229	1.0000e-005	0.0000	0.2231
Total	**9.0000e-005**	**1.3000e-004**	**1.2200e-003**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2229**	**0.2229**	**1.0000e-005**	**0.0000**	**0.2231**

3.3 Site Preparation - 2018

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1210	0.0000	0.1210	0.0663	0.0000	0.0663	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0215	0.2339	0.1793	1.8000e-004		0.0108	0.0108		9.9400e-003	9.9400e-003	0.0000	16.2608	16.2608	5.0600e-003	0.0000	16.3671
Total	**0.0215**	**0.2339**	**0.1793**	**1.8000e-004**	**0.1210**	**0.0108**	**0.1318**	**0.0663**	**9.9400e-003**	**0.0762**	**0.0000**	**16.2608**	**16.2608**	**5.0600e-003**	**0.0000**	**16.3671**

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0118	0.1569	0.1350	4.8000e-004	0.0109	2.1900e-003	0.0131	3.0000e-003	2.0100e-003	5.0100e-003	0.0000	42.7233	42.7233	3.2000e-004	0.0000	42.7300
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	2.5000e-004	2.4500e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4457	0.4457	2.0000e-005	0.0000	0.4462
Total	**0.0120**	**0.1571**	**0.1375**	**4.9000e-004**	**0.0115**	**2.1900e-003**	**0.0136**	**3.1500e-003**	**2.0100e-003**	**5.1600e-003**	**0.0000**	**43.1690**	**43.1690**	**3.4000e-004**	**0.0000**	**43.1762**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0545	0.0000	0.0545	0.0149	0.0000	0.0149	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3200e-003	0.1493	0.0936	1.8000e-004		3.1700e-003	3.1700e-003		3.1700e-003	3.1700e-003	0.0000	16.2608	16.2608	5.0600e-003	0.0000	16.3671
Total	**4.3200e-003**	**0.1493**	**0.0936**	**1.8000e-004**	**0.0545**	**3.1700e-003**	**0.0576**	**0.0149**	**3.1700e-003**	**0.0181**	**0.0000**	**16.2608**	**16.2608**	**5.0600e-003**	**0.0000**	**16.3671**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0118	0.1569	0.1350	4.8000e-004	0.0109	2.1900e-003	0.0131	3.0000e-003	2.0100e-003	5.0100e-003	0.0000	42.7233	42.7233	3.2000e-004	0.0000	42.7300
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	2.5000e-004	2.4500e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4457	0.4457	2.0000e-005	0.0000	0.4462
Total	**0.0120**	**0.1571**	**0.1375**	**4.9000e-004**	**0.0115**	**2.1900e-003**	**0.0136**	**3.1500e-003**	**2.0100e-003**	**5.1600e-003**	**0.0000**	**43.1690**	**43.1690**	**3.4000e-004**	**0.0000**	**43.1762**

3.4 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5800e-003	0.0249	0.0194	3.0000e-005		1.7200e-003	1.7200e-003		1.5800e-003	1.5800e-003	0.0000	2.3941	2.3941	7.5000e-004	0.0000	2.4098
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5800e-003**	**0.0249**	**0.0194**	**3.0000e-005**		**1.7200e-003**	**1.7200e-003**		**1.5800e-003**	**1.5800e-003**	**0.0000**	**2.3941**	**2.3941**	**7.5000e-004**	**0.0000**	**2.4098**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	1.3000e-004	1.2200e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2229	0.2229	1.0000e-005	0.0000	0.2231
Total	**9.0000e-005**	**1.3000e-004**	**1.2200e-003**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2229**	**0.2229**	**1.0000e-005**	**0.0000**	**0.2231**

<u>Mitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.2300e-003	0.0255	0.0198	3.0000e-005		1.0300e-003	1.0300e-003		1.0300e-003	1.0300e-003	0.0000	2.3941	2.3941	7.5000e-004	0.0000	2.4098
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.2300e-003**	**0.0255**	**0.0198**	**3.0000e-005**		**1.0300e-003**	**1.0300e-003**		**1.0300e-003**	**1.0300e-003**	**0.0000**	**2.3941**	**2.3941**	**7.5000e-004**	**0.0000**	**2.4098**

<u>Mitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	1.3000e-004	1.2200e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2229	0.2229	1.0000e-005	0.0000	0.2231
Total	**9.0000e-005**	**1.3000e-004**	**1.2200e-003**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2229**	**0.2229**	**1.0000e-005**	**0.0000**	**0.2231**

3.5 Excavation - 2018

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.3200e-003	0.0526	0.0467	6.0000e-005		3.7300e-003	3.7300e-003		3.4300e-003	3.4300e-003	0.0000	5.6749	5.6749	1.7700e-003	0.0000	5.7120
Total	**5.3200e-003**	**0.0526**	**0.0467**	**6.0000e-005**	**0.0000**	**3.7300e-003**	**3.7300e-003**	**0.0000**	**3.4300e-003**	**3.4300e-003**	**0.0000**	**5.6749**	**5.6749**	**1.7700e-003**	**0.0000**	**5.7120**

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	2.5000e-004	2.4500e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4457	0.4457	2.0000e-005	0.0000	0.4462
Total	**1.8000e-004**	**2.5000e-004**	**2.4500e-003**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4457**	**0.4457**	**2.0000e-005**	**0.0000**	**0.4462**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5300e-003	0.0551	0.0468	6.0000e-005		3.3000e-003	3.3000e-003		3.1000e-003	3.1000e-003	0.0000	5.6749	5.6749	1.7700e-003	0.0000	5.7120
Total	**4.5300e-003**	**0.0551**	**0.0468**	**6.0000e-005**	**0.0000**	**3.3000e-003**	**3.3000e-003**	**0.0000**	**3.1000e-003**	**3.1000e-003**	**0.0000**	**5.6749**	**5.6749**	**1.7700e-003**	**0.0000**	**5.7120**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	2.5000e-004	2.4500e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4457	0.4457	2.0000e-005	0.0000	0.4462
Total	**1.8000e-004**	**2.5000e-004**	**2.4500e-003**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4457**	**0.4457**	**2.0000e-005**	**0.0000**	**0.4462**

3.6 Building Construction: Substation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5800e-003	0.0151	9.8400e-003	1.0000e-005		1.0400e-003	1.0400e-003		9.6000e-004	9.6000e-004	0.0000	1.2896	1.2896	4.0000e-004	0.0000	1.2980
Total	**1.5800e-003**	**0.0151**	**9.8400e-003**	**1.0000e-005**		**1.0400e-003**	**1.0400e-003**		**9.6000e-004**	**9.6000e-004**	**0.0000**	**1.2896**	**1.2896**	**4.0000e-004**	**0.0000**	**1.2980**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					tons/yr								MT/yr			
Hauling	3.3000e-004	4.3700e-003	3.7600e-003	1.0000e-005	3.3000e-004	6.0000e-005	3.9000e-004	9.0000e-005	6.0000e-005	1.5000e-004	0.0000	1.1914	1.1914	1.0000e-005	0.0000	1.1915
Vendor	1.8600e-003	0.0160	0.0232	5.0000e-005	1.2800e-003	2.4000e-004	1.5200e-003	3.7000e-004	2.2000e-004	5.8000e-004	0.0000	4.1349	4.1349	3.0000e-005	0.0000	4.1355
Worker	1.4500e-003	2.0500e-003	0.0198	5.0000e-005	4.4200e-003	3.0000e-005	4.4600e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	3.6102	3.6102	1.7000e-004	0.0000	3.6139
Total	**3.6400e-003**	**0.0224**	**0.0468**	**1.1000e-004**	**6.0300e-003**	**3.3000e-004**	**6.3700e-003**	**1.6400e-003**	**3.1000e-004**	**1.9400e-003**	**0.0000**	**8.9364**	**8.9364**	**2.1000e-004**	**0.0000**	**8.9409**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					tons/yr								MT/yr			
Off-Road	7.2000e-004	0.0139	9.6900e-003	1.0000e-005		5.4000e-004	5.4000e-004		5.3000e-004	5.3000e-004	0.0000	1.2896	1.2896	4.0000e-004	0.0000	1.2980
Total	**7.2000e-004**	**0.0139**	**9.6900e-003**	**1.0000e-005**		**5.4000e-004**	**5.4000e-004**		**5.3000e-004**	**5.3000e-004**	**0.0000**	**1.2896**	**1.2896**	**4.0000e-004**	**0.0000**	**1.2980**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					tons/yr								MT/yr			
Hauling	3.3000e-004	4.3700e-003	3.7600e-003	1.0000e-005	3.3000e-004	6.0000e-005	3.9000e-004	9.0000e-005	6.0000e-005	1.5000e-004	0.0000	1.1914	1.1914	1.0000e-005	0.0000	1.1915
Vendor	1.8600e-003	0.0160	0.0232	5.0000e-005	1.2800e-003	2.4000e-004	1.5200e-003	3.7000e-004	2.2000e-004	5.8000e-004	0.0000	4.1349	4.1349	3.0000e-005	0.0000	4.1355
Worker	1.4500e-003	2.0500e-003	0.0198	5.0000e-005	4.4200e-003	3.0000e-005	4.4600e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	3.6102	3.6102	1.7000e-004	0.0000	3.6139
Total	**3.6400e-003**	**0.0224**	**0.0468**	**1.1000e-004**	**6.0300e-003**	**3.3000e-004**	**6.3700e-003**	**1.6400e-003**	**3.1000e-004**	**1.9400e-003**	**0.0000**	**8.9364**	**8.9364**	**2.1000e-004**	**0.0000**	**8.9409**

3.6 Building Construction: Substation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					tons/yr								MT/yr			
Off-Road	1.6000e-004	1.5100e-003	1.0600e-003	0.0000		1.0000e-004	1.0000e-004		9.0000e-005	9.0000e-005	0.0000	0.1410	0.1410	4.0000e-005	0.0000	0.1419
Total	**1.6000e-004**	**1.5100e-003**	**1.0600e-003**	**0.0000**		**1.0000e-004**	**1.0000e-004**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.1410**	**0.1410**	**4.0000e-005**	**0.0000**	**0.1419**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	4.5000e-004	4.0000e-004	0.0000	2.6000e-004	1.0000e-005	2.7000e-004	7.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.1301	0.1301	0.0000	0.0000	0.1301
Vendor	1.9000e-004	1.6300e-003	2.4500e-003	1.0000e-005	1.4000e-004	2.0000e-005	1.7000e-004	4.0000e-005	2.0000e-005	6.0000e-005	0.0000	0.4514	0.4514	0.0000	0.0000	0.4515
Worker	1.5000e-004	2.1000e-004	2.0000e-003	1.0000e-005	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3867	0.3867	2.0000e-005	0.0000	0.3871
Total	**3.7000e-004**	**2.2900e-003**	**4.8500e-003**	**2.0000e-005**	**8.9000e-004**	**3.0000e-005**	**9.4000e-004**	**2.4000e-004**	**3.0000e-005**	**2.6000e-004**	**0.0000**	**0.9682**	**0.9682**	**2.0000e-005**	**0.0000**	**0.9687**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.0000e-005	1.5200e-003	1.0700e-003	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.1410	0.1410	4.0000e-005	0.0000	0.1419
Total	**8.0000e-005**	**1.5200e-003**	**1.0700e-003**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.1410**	**0.1410**	**4.0000e-005**	**0.0000**	**0.1419**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	4.5000e-004	4.0000e-004	0.0000	2.6000e-004	1.0000e-005	2.7000e-004	7.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.1301	0.1301	0.0000	0.0000	0.1301
Vendor	1.9000e-004	1.6300e-003	2.4500e-003	1.0000e-005	1.4000e-004	2.0000e-005	1.7000e-004	4.0000e-005	2.0000e-005	6.0000e-005	0.0000	0.4514	0.4514	0.0000	0.0000	0.4515
Worker	1.5000e-004	2.1000e-004	2.0000e-003	1.0000e-005	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3867	0.3867	2.0000e-005	0.0000	0.3871
Total	**3.7000e-004**	**2.2900e-003**	**4.8500e-003**	**2.0000e-005**	**8.9000e-004**	**3.0000e-005**	**9.4000e-004**	**2.4000e-004**	**3.0000e-005**	**2.6000e-004**	**0.0000**	**0.9682**	**0.9682**	**2.0000e-005**	**0.0000**	**0.9687**

3.7 Building Construction: Distribution Line - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.4700e-003	0.0452	0.0201	7.0000e-005		1.5600e-003	1.5600e-003		1.4300e-003	1.4300e-003	0.0000	6.8402	6.8402	2.1300e-003	0.0000	6.8849
Total	**3.4700e-003**	**0.0452**	**0.0201**	**7.0000e-005**		**1.5600e-003**	**1.5600e-003**		**1.4300e-003**	**1.4300e-003**	**0.0000**	**6.8402**	**6.8402**	**2.1300e-003**	**0.0000**	**6.8849**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8600e-003	0.0160	0.0232	5.0000e-005	1.2800e-003	2.4000e-004	1.5200e-003	3.7000e-004	2.2000e-004	5.8000e-004	0.0000	4.1349	4.1349	3.0000e-005	0.0000	4.1355
Worker	1.4500e-003	2.0500e-003	0.0198	5.0000e-005	4.4200e-003	3.0000e-005	4.4600e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	3.6102	3.6102	1.7000e-004	0.0000	3.6139
Total	**3.3100e-003**	**0.0181**	**0.0430**	**1.0000e-004**	**5.7000e-003**	**2.7000e-004**	**5.9800e-003**	**1.5500e-003**	**2.5000e-004**	**1.7900e-003**	**0.0000**	**7.7450**	**7.7450**	**2.0000e-004**	**0.0000**	**7.7494**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8800e-003	0.0425	0.0209	7.0000e-005		1.3000e-003	1.3000e-003		1.2000e-003	1.2000e-003	0.0000	6.8402	6.8402	2.1300e-003	0.0000	6.8849
Total	**2.8800e-003**	**0.0425**	**0.0209**	**7.0000e-005**		**1.3000e-003**	**1.3000e-003**		**1.2000e-003**	**1.2000e-003**	**0.0000**	**6.8402**	**6.8402**	**2.1300e-003**	**0.0000**	**6.8849**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8600e-003	0.0160	0.0232	5.0000e-005	1.2800e-003	2.4000e-004	1.5200e-003	3.7000e-004	2.2000e-004	5.8000e-004	0.0000	4.1349	4.1349	3.0000e-005	0.0000	4.1355
Worker	1.4500e-003	2.0500e-003	0.0198	5.0000e-005	4.4200e-003	3.0000e-005	4.4600e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	3.6102	3.6102	1.7000e-004	0.0000	3.6139
Total	**3.3100e-003**	**0.0181**	**0.0430**	**1.0000e-004**	**5.7000e-003**	**2.7000e-004**	**5.9800e-003**	**1.5500e-003**	**2.5000e-004**	**1.7900e-003**	**0.0000**	**7.7450**	**7.7450**	**2.0000e-004**	**0.0000**	**7.7494**

3.7 Building Construction: Distribution Line - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.5000e-004	4.4200e-003	2.1500e-003	1.0000e-005		1.5000e-004	1.5000e-004		1.4000e-004	1.4000e-004	0.0000	0.7466	0.7466	2.4000e-004	0.0000	0.7515
Total	**3.5000e-004**	**4.4200e-003**	**2.1500e-003**	**1.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.7466**	**0.7466**	**2.4000e-004**	**0.0000**	**0.7515**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	1.6300e-003	2.4500e-003	1.0000e-005	1.4000e-004	2.0000e-005	1.7000e-004	4.0000e-005	2.0000e-005	6.0000e-005	0.0000	0.4514	0.4514	0.0000	0.0000	0.4515
Worker	1.5000e-004	2.1000e-004	2.0000e-003	1.0000e-005	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3867	0.3867	2.0000e-005	0.0000	0.3871
Total	**3.4000e-004**	**1.8400e-003**	**4.4500e-003**	**2.0000e-005**	**6.3000e-004**	**2.0000e-005**	**6.7000e-004**	**1.7000e-004**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**0.8381**	**0.8381**	**2.0000e-005**	**0.0000**	**0.8386**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.9000e-004	4.2500e-003	2.2700e-003	1.0000e-005		1.3000e-004	1.3000e-004		1.2000e-004	1.2000e-004	0.0000	0.7466	0.7466	2.4000e-004	0.0000	0.7515
Total	**2.9000e-004**	**4.2500e-003**	**2.2700e-003**	**1.0000e-005**		**1.3000e-004**	**1.3000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.7466**	**0.7466**	**2.4000e-004**	**0.0000**	**0.7515**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	1.6300e-003	2.4500e-003	1.0000e-005	1.4000e-004	2.0000e-005	1.7000e-004	4.0000e-005	2.0000e-005	6.0000e-005	0.0000	0.4514	0.4514	0.0000	0.0000	0.4515
Worker	1.5000e-004	2.1000e-004	2.0000e-003	1.0000e-005	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3867	0.3867	2.0000e-005	0.0000	0.3871
Total	**3.4000e-004**	**1.8400e-003**	**4.4500e-003**	**2.0000e-005**	**6.3000e-004**	**2.0000e-005**	**6.7000e-004**	**1.7000e-004**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**0.8381**	**0.8381**	**2.0000e-005**	**0.0000**	**0.8386**

3.8 Building Construction: Overhead Lines - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6300e-003	0.0183	0.0133	3.0000e-005		9.7000e-004	9.7000e-004		8.9000e-004	8.9000e-004	0.0000	2.7323	2.7323	8.5000e-004	0.0000	2.7502
Total	**1.6300e-003**	**0.0183**	**0.0133**	**3.0000e-005**		**9.7000e-004**	**9.7000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**2.7323**	**2.7323**	**8.5000e-004**	**0.0000**	**2.7502**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.1000e-004	3.5600e-003	5.1600e-003	1.0000e-005	2.8000e-004	5.0000e-005	3.4000e-004	8.0000e-005	5.0000e-005	1.3000e-004	0.0000	0.9189	0.9189	1.0000e-005	0.0000	0.9190
Worker	3.2000e-004	4.6000e-004	4.4000e-003	1.0000e-005	9.8000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8023	0.8023	4.0000e-005	0.0000	0.8031
Total	**7.3000e-004**	**4.0200e-003**	**9.5600e-003**	**2.0000e-005**	**1.2600e-003**	**6.0000e-005**	**1.3300e-003**	**3.4000e-004**	**6.0000e-005**	**4.0000e-004**	**0.0000**	**1.7211**	**1.7211**	**5.0000e-005**	**0.0000**	**1.7221**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4700e-003	0.0188	0.0133	3.0000e-005		8.8000e-004	8.8000e-004		8.2000e-004	8.2000e-004	0.0000	2.7323	2.7323	8.5000e-004	0.0000	2.7502
Total	**1.4700e-003**	**0.0188**	**0.0133**	**3.0000e-005**		**8.8000e-004**	**8.8000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.7323**	**2.7323**	**8.5000e-004**	**0.0000**	**2.7502**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.1000e-004	3.5600e-003	5.1600e-003	1.0000e-005	2.8000e-004	5.0000e-005	3.4000e-004	8.0000e-005	5.0000e-005	1.3000e-004	0.0000	0.9189	0.9189	1.0000e-005	0.0000	0.9190
Worker	3.2000e-004	4.6000e-004	4.4000e-003	1.0000e-005	9.8000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8023	0.8023	4.0000e-005	0.0000	0.8031
Total	**7.3000e-004**	**4.0200e-003**	**9.5600e-003**	**2.0000e-005**	**1.2600e-003**	**6.0000e-005**	**1.3300e-003**	**3.4000e-004**	**6.0000e-005**	**4.0000e-004**	**0.0000**	**1.7211**	**1.7211**	**5.0000e-005**	**0.0000**	**1.7221**

3.9 Trenching - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3300e-003	0.0234	0.0230	3.0000e-005		1.5600e-003	1.5600e-003		1.4400e-003	1.4400e-003	0.0000	2.7900	2.7900	8.8000e-004	0.0000	2.8085
Total	**2.3300e-003**	**0.0234**	**0.0230**	**3.0000e-005**		**1.5600e-003**	**1.5600e-003**		**1.4400e-003**	**1.4400e-003**	**0.0000**	**2.7900**	**2.7900**	**8.8000e-004**	**0.0000**	**2.8085**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	1.2000e-004	1.1100e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2148	0.2148	1.0000e-005	0.0000	0.2150
Total	**8.0000e-005**	**1.2000e-004**	**1.1100e-003**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2148**	**0.2148**	**1.0000e-005**	**0.0000**	**0.2150**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0400e-003	0.0256	0.0232	3.0000e-005		1.4500e-003	1.4500e-003		1.3600e-003	1.3600e-003	0.0000	2.7900	2.7900	8.8000e-004	0.0000	2.8085
Total	**2.0400e-003**	**0.0256**	**0.0232**	**3.0000e-005**		**1.4500e-003**	**1.4500e-003**		**1.3600e-003**	**1.3600e-003**	**0.0000**	**2.7900**	**2.7900**	**8.8000e-004**	**0.0000**	**2.8085**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	1.2000e-004	1.1100e-003	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2148	0.2148	1.0000e-005	0.0000	0.2150
Total	**8.0000e-005**	**1.2000e-004**	**1.1100e-003**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2148**	**0.2148**	**1.0000e-005**	**0.0000**	**0.2150**

Project Name: **Equinix Xilinx Site SV12, SV13, SV14**

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size	**191,000**	**s.f. Building SV12**	**18**	**total project acres disturbed**	
	191,000	**s.f. Building SV13**			
	191,000	**s.f. Building SV14**			
		s.f. parking lot			
Construction Hours		**am to**		**pm**	

Note: this worksheet includes site work for all 18 acres occurs at beginning of project

Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
								Vegetation Removal
	Site Preperation	**Start Date:**	**11/1/2016**	**Total phase:**	**10**			hauled material? _?_ tons
		End Date:						
3	Rubber Tired Dozers	255	0.4	8		0	0	
4	Tractors/Loaders/Backhoes	97	0.37	8		0	0	
	Other Equipment?							
	Grading / Excavation	**Start Date:**		**Total phase:**	**30**			
		End Date:						**Soil Hauling Volume**
2	Excavators	162	0.38	8		0	0	Export volume = _?_ cubic yards?
1	Graders	174	0.41	8		0	0	Import volume = _?_ cubic yards?
1	Rubber Tired Dozers	255	0.4	8		0	0	
2	Scrapers	361	0.48	8				
2	Tractors/Loaders/Backhoes	97	0.37	8				
	Other Equipment?							

Project Name:		**Constrtuction of SV12 Building**						**Complete ALL Portions in Yellow**
	See Equipment Type TAB for type, horsepower and load factor							
	Project Size	**191,000**	**s.f. Building**	**18**	**total project**	**acres disturbed**		
	Construction Hours		**s.f. parking lot am to**		**pm**			
Qty	**Description**	**HP**	**Load Factor**	**Hours/day**	**Total Work Days**	**Avg. Hours per day**	**Annual Hours**	**Comments**
								Vegetation Removal
	Constrtuction of SV12 Building							Export ____ cy
	Trenching/Fine Grading	**Start Date:**	**11/1/2016**	**Total phase:**	**20**			Material Import/Export
		End Date:						Import ____ cy
1	Tractor/Loader/Backhoe	97	0.37	8		0	0	Export ____ cy
1	Excavators	162	0.38	8		0		
	Other Equipment?							
	Building - Exterior	**Start Date:**		**Total phase:**	**230**			**Cement Trucks? _?_ Total Round-Trips**
		End Date:						
1	Cranes	226	0.29	7		#DIV/0!	0	Electric? (Y/N) ___ Otherwise assumed diesel
3	Forklifts	89	0.2	8		#DIV/0!	0	Liquid Propane (LPG)? (Y/N) ___ Otherwise Assumed diesel
1	Generator Sets	84	0.74	8		#DIV/0!	0	Or temporary line power? (Y/N) ___
3	Tractors/Loaders/Backhoes	97	0.37	7		#DIV/0!	0	
1	Welders	46	0.45	8		#DIV/0!	0	
	Other Equipment?							
Building - Interior/Architectural Coating		**Start Date:**		**Total phase:**	**20**			
		End Date:						
1	Air Compressors	78	0.48	8		0	0	
1	Aerial Lift	62	0.31	8		0	0	
	Other Equipment?							
	Paving	**Start Date:**		**Total phase:**	**20**			
		Start Date:						
2	Pavers	125	0.42	8		0	0	**Asphalt? ___ cubic yards or ____ round trips?**
2	Paving Equipment	130	0.36	8		0	0	
2	Rollers	80	0.38	8		0	0	
	Other Equipment?							

Project Name: **Constrtuction of SV13 Building**

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

	Project Size	191,000	s.f. Building	18	total project	acres disturbed		
			s.f. parking lot					
	Construction Hours		am to		pm			
Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
								Vegetation Removal
	Constrtuction of SV12 Building							Export ____ cy
	Trenching/Fine Grading	Start Date:	5/1/2016	Total phase:	20			Material Import/Export
		End Date:						Import ____ cy
1	Tractor/Loader/Backhoe	97	0.37	8		0	0	Export ____ cy
1	Excavators	162	0.38	8		0		
	Other Equipment?							
	Building - Exterior	Start Date:		Total phase:	230			Cement Trucks? _?_ Total Round-Trips
		End Date:						
1	Cranes	226	0.29	7		#DIV/0!	0	Electric? (Y/N) ___ Otherwise assumed diesel
3	Forklifts	89	0.2	8		#DIV/0!	0	Liquid Propane (LPG)? (Y/N) ___ Otherwise Assumed diesel
1	Generator Sets	84	0.74	8		#DIV/0!	0	Or temporary line power? (Y/N) ___
3	Tractors/Loaders/Backhoes	97	0.37	7		#DIV/0!	0	
1	Welders	46	0.45	8		#DIV/0!	0	
	Other Equipment?							
Building - Interior/Architectural Coating		Start Date:		Total phase:	20			
		End Date:						
1	Air Compressors	78	0.48	8		0	0	
1	Aerial Lift	62	0.31	8		0	0	
	Other Equipment?							
	Paving	Start Date:		Total phase:	20			
		Start Date:						
2	Pavers	125	0.42	8		0	0	Asphalt? ___ cubic yards or ____ round trips?
2	Paving Equipment	130	0.36	8		0	0	
2	Rollers	80	0.38	8		0	0	
	Other Equipment?							

Project Name: **Constrtuction of SV14 Building**

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size	191,000	s.f. Building	18	total project acres disturbed		
		s.f. parking lot				
Construction Hours		am to		pm		

Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
								Vegetation Removal
	Constrtuction of SV12 Building							Export ____ cy
	Trenching/Fine Grading	**Start Date:**	12/1/2016	**Total phase:**	20			**Material Import/Export**
		End Date:						Import ____ cy
1	Tractor/Loader/Backhoe	97	0.37	8		0	0	Export ____ cy
1	Excavators	162	0.38	8		0		
	Other Equipment?							
	Building - Exterior	**Start Date:**		**Total phase:**	230			**Cement Trucks? _?_ Total Round-Trips**
		End Date:						
1	Cranes	226	0.29	7		#DIV/0!	0	Electric? (Y/N) ___ Otherwise assumed diesel
3	Forklifts	89	0.2	8		#DIV/0!	0	Liquid Propane (LPG)? (Y/N) ___ Otherwise Assumed diesel
1	Generator Sets	84	0.74	8		#DIV/0!	0	Or temporary line power? (Y/N) ___
3	Tractors/Loaders/Backhoes	97	0.37	7		#DIV/0!	0	
1	Welders	46	0.45	8		#DIV/0!	0	
	Other Equipment?							
Building - Interior/Architectural Coating		**Start Date:**		**Total phase:**	20			
		End Date:						
1	Air Compressors	78	0.48	8		0	0	
1	Aerial Lift	62	0.31	8		0	0	
	Other Equipment?							
	Paving	**Start Date:**		**Total phase:**	20			
		Start Date:						
2	Pavers	125	0.42	8		0	0	**Asphalt? ___ cubic yards or ____ round trips?**
2	Paving Equipment	130	0.36	8		0	0	
2	Rollers	80	0.38	8		0	0	
	Other Equipment?							

Typical Equipment Type & Load Factors		
OFFROAD Equipment Type	**Horsepower**	**Load Factor**
Aerial Lifts	62	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	205	0.5
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	162	0.38
Forklifts	89	0.2
Generator Sets	84	0.74
Graders	174	0.41
Off-Highway Tractors	122	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	171	0.42
Other General Industrial Equipment	150	0.34
Other Material Handling Equipment	167	0.4
Pavers	125	0.42
Paving Equipment	130	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.2
Pumps	84	0.74
Rollers	80	0.38
Rough Terrain Forklifts	100	0.4
Rubber Tired Dozers	255	0.4
Rubber Tired Loaders	199	0.36
Scrapers	361	0.48
Signal Boards	6	0.82
Skid Steer Loaders	64	0.37
Surfacing Equipment	253	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37

Trenchers	80	0.5
Welders	46	0.45

Xilinx Data Center – Substation and Via Del Oro & Transmission/Conductor Lines
Note: All data are best estimates and based on preliminary substation design and similar substation projects. Actual dates will be based on permitting and resource availability

REQUIRED CONSTRUCTION INFORMATION FOR TAC ANALYSIS				
Construction Phase	**Equipment (*See next page for examples of commonly used equipment*)**	**Quantity**	**Hours Used Per Day**	**Number of Work Days**
Relocation of on-site Storage	• 1-ton Truck	1	8	20
	• Forklift	1	8	20
	•			
Start Date: 08/2018	•			
End Date: 09/2018	•			
Site Preparation/ Site Grading	• D-3 Bulldozer	1	8	40
	• Water Truck	1	8	40
	• 1 –ton Truck	1	8	40
Start Date: 09/2018	• Dump Truck	1	8	40
End Date: 11/2018	•			
Excavation of Foundations	• Crawler Backhoe	1	8	40
	• 1 –ton Truck	1	8	40
	• Dump Truck	1	8	40
Start Date: 11/2018	• Truck-mounted Digger	1	8	40
End Date: 01/2019	•			
Trenching in Substation	• Crawler Backhoe	1	8	20
	• 1 –ton Truck	1	8	20
	• Dump Truck	1	8	20
Start Date: 01/2019	• Truck-mounted Digger	1	8	20
End Date: 03/2019	•			
Building – Substation	• Cement Mixer or Concrete Truck	1	8	40
	• 50 to 70-ton crane	1	6	2
	• Line Truck	1	4	4
	• Wire Puller	1	2	2
Start Date: 11/2018	• Fork Lift	1	3	40
End Date: 04/2019	• ¾ to 1-ton pickup trucks	3	3	8
Building – Overhead Transmission Line Extension, Install	• ¾ to 1-ton pickup trucks	3	3	5
	• 50 to 70-ton crane	1	4	1
	• Wire Puller	1	2	2
	• Bucket Truck	2	5	8

REQUIRED CONSTRUCTION INFORMATION FOR TAC ANALYSIS				
Construction Phase	**Equipment (*See next page for examples of commonly used equipment*)**	**Quantity**	**Hours Used Per Day**	**Number of Work Days**
TSPs **Start Date:** 11/2018 **End Date**: 04/2019	• Boom Truck	1	6	1
	• Lo-Drill	1	8	3
Building – Underground Distribution Line **Start Date:** 11/2018 **End Date**: 04/2019	• ¾ to 1-ton pickup trucks	3	3	40
	• Bore Rig	1	8	20
	• Crawler Backhoe	1	8	40
	• Crew Truck	2	8	40
	• Dump Truck	1	8	40
	•			
Paving Substation with Gravel **Start Date:** 09/2018 **End Date**: 11/2018	• Gravel Dump Truck	1	5	20
	• Roller	1	8	20
	•			
	•			

OTHER – Provide as Applicable	
Soil Hauling Volume	Export volume = __1,800___ cubic yards? Import volume = ___8,525_____ cubic yards?
Demolition Volume	Square footage of buildings to be demolished, or total tons to be hauled. =_0__ square feet or =_0__ hauling volume (tons) Pavement demolished and hauled =_0_ tons
Cement	Cement Trucks = 20 Total Round-Trips OR Cement =__ cubic yards Electric? (Y/N) _N__Otherwise modelling assumes diesel Liquid Propane (LPG)? (Y/N) _N__Otherwise modelling assumes diesel Or temporary line power? (Y/N) _N__
Asphalt	__0__ cy or _____ round trips

Example of Equipment Commonly Used for Each Construction Phase
Demolition
Concrete/Industrial Saws
Excavators

Rubber-Tired Dozers
Site Preparation
Rubber Tired Dozers
Tractors/Loaders/Backhoes
Grading / Excavation
Excavators
Graders
Rubber Tired Dozers
Tractors/Loaders/Backhoes
Trenching
Tractor/Loader/Backhoe
Building - Exterior
Cranes
Forklifts
Generator Sets
Tractors/Loaders/Backhoes
Welders
Building – Interior/ Architectural Coating
Air Compressors
Aerial Lift
Paving
Cement and Mortar Mixers
Pavers
Paving Equipment
Rollers
Tractors/Loaders/Backhoes

Attachment 2: Operational Emissions

- **Data Center Emergency Generators Emission Calculations and Engine Data**
- **CalEEMod Operation Emission Output**

March 31, 2016

To Whom It May Concern:

With regards to Cummins Power Generation (CPG) manufactured diesel generator set model C3000D6e rated for 60 Hz operation and equipped with a Cummins QSK95-G9 engine:

When tested under the following conditions:

Fuel Specification:	40-48 Cetane Number, 0.03 -0.05 Wt.% Sulfur; Reference ISO8178-5, 40CFR86, 1313--98 Type 2-D and ASTM D975 No. 2-D.
Air Inlet Temperature :	25°C (77°F)
Fuel Inlet Temperature:	40°C (104°F)
Barometric Pressure:	100 kPa (29.53 in Hg)
Humidity:	NOx measurement corrected to 10.7 g/kg (75 grains H2O/lb) of dry air
Intake Restriction:	Set to maximum allowable limit for clean filter
Exhaust Back:	Pressure set to maximum allowable limit.

	Standby			
PERFORMANCE DATA	**100%**	**75%**	**50%**	**25%**
BHP @ 1800 RPM (60 Hz)	4307	3256	2206	1155
Fuel Consumption (Gal/Hr)	208	160	118	68
Exhaust Gas Flow (CFM)	23365	19695	16018	10028
Exhaust Gas Temperature (°F)	830	714	670	630
EXHAUST EMISSION DATA				
HC (Total Unburned Hydrocarbons)	0.07	0.10	0.18	0.30
NOx (Oxides of Nitrogen as NO2)	5.23	4.23	3.26	3.44
CO (Carbon Monoxide)	0.21	0.14	0.23	0.46
PM (Particular Matter)	0.045	0.058	0.100	0.207
SO2 (Sulfur Dioxide)	0.005	0.005	0.005	0.006
Smoke (FSN)	0.44	0.46	0.61	0.92
				All Values are Grams/HP-Hour

Steady-State emissions recorded per ISO8178-1 during operation at rated engine speed (+/-2%) and stated constant load (+/-2%) with engine temperatures, pressures and emission rates stabilized.

The NOx, HC, CO and PM emission data tabulated here are representative of test data taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions,

Cummins Power Generation
1400 73rd Avenue NE
Minneapolis, MN 55432 USA
cumminspower.com

installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may results in elevated emission levels.

This letter does not supersede any of the commercial terms of sale, including, but not limited to, warranty coverage. For further questions on this product or application, please contact the local Cummins Power Generation distributor.

Best Regards,

Michael Sanford
Team Leader – Sales Application Engineering
North America/Caribbean
Cummins Power Generation
(651) 787-6293
michael.sanford@cummins.com

Table 1a
Xilinx Data Center - Emergency Backup Generators
Emissions Per Data Center Building (7 Engines)
Emissions From Periodic Engine Testing with no Generator Load

Periodic Testing at Low Engine Load*

Manufacturer/Model	**Cummins**	
Engine	**QSK95-G9**	
Total No. Units	7	
Generator Output (kW)	-	
Load During Testing	25%	
Engine Output (hp)	1,155	
Fuel Use (gal/hr) at Load	68	
Fuel Sulfur Content (%)	0.0015	
Emission Testing Information		
	Maximum Daily Testing	**Maximum** Annual Testing**
No. Units Tested. =	7	7
Test Duration/Unit (min) =	5	5
Tests per Period/Unit =	1	12
Operation./Unit (hours) =	0.08	1.0
Total Operation (hours) =	0.58	7.0

Pollutant	Emission[1] Factor (g/hp-hr)	Emission Rate per Unit (lb/hr)	Operational Maximum Emissions per Unit Daily (lb/day)	Annual (lb/yr)	Annual (ton/yr)	Operational - Total Emissions[2] Daily Maximum (lb/day)	Annual Maximum (lb/yr)	(ton/yr)
NOx[1a]	3.44	8.76	0.73	8.76	0.004	5.11	61.3	0.03
HC[1a]	0.30	0.76	0.06	0.76	0.000	0.45	5.3	0.00
CO[1a]	0.46	1.17	0.10	1.17	0.001	0.68	8.2	0.00
PM10[1a]	0.21	0.53	0.044	0.53	0.0003	0.31	3.7	0.002
PM2.5[3]	0.19	0.49	0.041	0.49	0.0002	0.29	3.5	0.002
SOx[1a]	0.006	0.02	0.001	0.02	0.0000	0.009	0.1	0.000
CO_2[1b]	22.38 lb/gal	1,522	127	1,522	0.8	888	10,651	5

Notes: * Emissions at 25% engine load for 5 minutes per test with no generator load attached assumed for normal testing of engines

** Maximum annual testing based on 1 hour for periodic normal testing an low load per unit per year.

1) Based on manufacturer's data at 25% load.

1a) Cummins QSK95-G9 engine emissions and performance data at 25% load (Cummins Power Generation, March 31, 2016)

1b) CO_2 emission factor from California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009

2) Based on the number of units operating for the specified time period

3) Based on CARB CEIDERS PM profile for diesel IC engines, PM2.5 fraction of PM = 0.937

Table 1b
Xilinx Data Center - Emergency Backup Generators
Emissions Per Data Center Building (7 Engines)
Emissions From Periodic Generator Full Load Testing

Periodic Generator Full Load Testing*

Manufacturer/Model	**Cummins**	
Engine	**QSK95-G9**	
Total No. Units	7	
Engine Operating Load	***100%***	
Generator Output (kW)	3,000	
Max Engine Output (hp)	4,307	
Load During Testing	100%	
Max Engine Output at Load (hp)	4,307	
Fuel Use (gal/hr) at Load	208	
Fuel Sulfur Content (%)	0.0015	
Emission Testing Information		
	Max. Daily Testing	**Maximum** Annual Testing**
No. Units Tested. =	7	7
Test Duration/Unit (min) =	240	60
Tests per Period/Unit =	1	15
Operation./Unit (hours) =	4	15
Total Operation (hours) =	28	105

			Operational			**Operational - Total Emissions[2]**		
			Maximum Emissions per Unit					
Pollutant	**Emission[1] Factor (g/hp-hr)**	**Emission Rate per Unit (lb/hr)**	**Daily (lb/day)**	**Annual (lb/yr)**	**Annual (ton/yr)**	**Daily Maximum (lb/day)**	**Annual (lb/yr)**	**Annual (ton/yr)**
NOx[1a]	5.23	49.66	198.64	744.9	0.37	1390.50	5,214.4	2.61
HC[1a]	0.10	0.95	3.80	14.2	0.01	26.59	99.7	0.05
CO[1a]	0.40	3.80	15.19	57.0	0.03	106.35	398.8	0.20
PM10[1a]	0.01	0.12	0.49	1.9	0.0009	3.46	13.0	0.006
PM2.5[3]	0.01	0.12	0.46	1.7	0.0009	3.24	12.1	0.006
SOx[1a]	-	0.044	0.176	0.7	0.0003	1.23	4.6	0.0023
CO_2[1b]	22.38 lb/gal	4,654	18,617	69,815	34.9	130,322	488,707	244

Notes: * Emissions at 100% engine load for 1 hour per month plus an additional 3 hours at full load per year.
** Maximum annual generator load testing based on 15 hours of generator load testing per unit per year.
1) Based on manufacturer's data at 100% load.
1a) Cummins QSK95-G9 engine emissions and performance data at 100% load (Cummins Power Generation, March 31, 2016)
1b) CO_2 emission factor from California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009
2) Based on the number of units operating for the specified time period
3) Based on CARB CEIDERS PM profile for diesel IC engines, PM2.5 fraction of PM = 0.937

Table 1c
Xilinx Data Center - Emergency Backup Generators
Average Daily and Annual Emissions (21 Generators)

	Operational - Total Emissions (21 Generators)		
	Average* Daily	**Annual**	
Pollutant	**(lb/day)**	**(lb/yr)**	**(ton/yr)**
NOx	43.4	15,827	7.9
ROG	0.9	315	0.2
CO	3.3	1,221	0.6
PM10	0.1	50	0.02
PM2.5	0.1	47	0.02
SOx	0.04	14	0.01
CO_2	4104.3	1,498,075	749.0

* Average daily emissions calculated from total annual emissions and 365 days per year

Xilinx Data Center - Emergency Backup Generators
Emissions Per Data Center Building (7 Engines)
Emissions From Periodic Generator Full Load Testing
Operation for 50 Hours/Year at Full Load

Periodic Generator Full Load Testing*

Manufacturer/Model	**Cummins**	
Engine	**QSK95-G9**	
Total No. Units	7	
Engine Operating Load	***100%***	
Generator Output (kW)	3,000	
Max Engine Output (hp)	4,307	
Load During Testing	100%	
Max Engine Output at Load (hp)	4,307	
Fuel Use (gal/hr) at Load	208	
Fuel Sulfur Content (%)	0.0015	
Emission Testing Information		
	Max. Daily Testing	**Maximum** Annual Testing**
No. Units Tested. =	7	7
Test Duration/Unit (min) =	60	60
Tests per Period/Unit =	1	50
Operation./Unit (hours) =	1	50
Total Operation (hours) =	7	350

			Operational			Operational - Total Emissions[2]		
	Emission[1]	**Emission**	**Maximum Emissions per Unit**			**Daily**		
	Factor	**Rate per Unit**	**Daily**	**Annual**	**Annual**	**Maximum**	**Annual**	
Pollutant	**(g/hp-hr)**	**(lb/hr)**	**(lb/day)**	**(lb/yr)**	**(ton/yr)**	**(lb/day)**	**(lb/yr)**	**(ton/yr)**
NOx[1a]	5.23	49.66	49.66	2483.0	1.24	347.63	17,381.3	8.69
HC[1a]	0.10	0.95	0.95	47.5	0.02	6.65	332.3	0.17
CO[1a]	0.40	3.80	3.80	189.9	0.09	26.59	1,329.4	0.66
PM10[1a]	0.01	0.12	0.12	6.2	0.0031	0.86	43.2	0.022
PM2.5[3]	0.01	0.12	0.12	5.8	0.0029	0.81	40.5	0.020
SOx[1a]	-	0.044	0.044	2.2	0.0011	0.31	15.4	0.0077
CO_2[1b]	22.38 lb/gal	4,654	4,654	232,718	116.4	32,580	1,629,023	815

Notes: * Emissions at 100% engine load for 50 hours per year.
** Maximum annual generator load testing based on 50 hours of generator load testing per unit per year.
1) Based on manufacturer's data at 100% load.
1a) Cummins QSK95-G9 engine emissions and performance data at 100% load (Cummins Power Generation, March 31, 2016)
1b) CO_2 emission factor from California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009
2) Based on the number of units operating for the specified time period
3) Based on CARB CEIDERS PM profile for diesel IC engines, PM2.5 fraction of PM = 0.937

Xilinx Data Center - Emergency Backup Generators
Operation for 50 Hours/Year at Full Load
Average Daily and Annual Emissions (21 Generators)

	Operational - Total Emissions (21 Generators)		
	Average* Daily	**Annual**	
Pollutant	**(lb/day)**	**(lb/yr)**	**(ton/yr)**
NOx	142.9	52,144	26.1
ROG	2.7	997	0.5
CO	10.9	3,988	2.0
PM10	0.4	130	0.06
PM2.5	0.3	121	0.06
SOx	0.13	46	0.02
CO_2	13389.2	4,887,069	2443.5

* Average daily emissions calculated from total annual emissions and 365 days per year

Xilinx Data Center - Emergency Backup Generators
Emissions Per Data Center Building (7 Engines)
Emissions From Periodic Generator Full Load Testing
Operation for 16 Hours/Year at Full Load

Periodic Generator Full Load Testing*

Manufacturer/Model	**Cummins**
Engine	**QSK95-G9**
Total No. Units	7
Engine Operating Load	***100%***
Generator Output (kW)	3,000
Max Engine Output (hp)	4,307
Load During Testing	100%
Max Engine Output at Load (hp)	4,307
Fuel Use (gal/hr) at Load	208
Fuel Sulfur Content (%)	0.0015

Emission Testing Information

	Max. Daily Testing	Maximum** Annual Testing
No. Units Tested. =	7	7
Test Duration/Unit (min) =	60	60
Tests per Period/Unit =	1	16
Operation./Unit (hours) =	1	16
Total Operation (hours) =	7	112

			Operational			Operational - Total Emissions[2]		
	Emission[1]	Emission	Maximum Emissions per Unit			Daily		
	Factor	Rate per Unit	Daily	Annual	Annual	Maximum	Annual	
Pollutant	(g/hp-hr)	(lb/hr)	(lb/day)	(lb/yr)	(ton/yr)	(lb/day)	(lb/yr)	(ton/yr)
NOx[1a]	5.23	49.66	49.66	794.6	0.40	347.63	5,562.0	2.78
HC[1a]	0.10	0.95	0.95	15.2	0.01	6.65	106.3	0.05
CO[1a]	0.40	3.80	3.80	60.8	0.03	26.59	425.4	0.21
PM10[1a]	0.01	0.12	0.12	2.0	0.0010	0.86	13.8	0.007
PM2.5[3]	0.01	0.12	0.12	1.9	0.0009	0.81	13.0	0.006
SOx[1a]	-	0.044	0.044	0.7	0.0004	0.31	4.9	0.0025
CO_2[1b]	22.38 lb/gal	4,654	4,654	74,470	37.2	32,580	521,287	261

Notes: * Emissions at 100% engine load for 16 hours per year.
** Maximum annual generator load testing based on 16 hours of generator load testing per unit per year.
1) Based on manufacturer's data at 100% load.
1a) Cummins QSK95-G9 engine emissions and performance data at 100% load (Cummins Power Generation, March 31, 2016)
1b) CO_2 emission factor from California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009
2) Based on the number of units operating for the specified time period
3) Based on CARB CEIDERS PM profile for diesel IC engines, PM2.5 fraction of PM = 0.937

Xilinx Data Center - Emergency Backup Generators
Operation for 16 Hours/Year at Full Load
Average Daily and Annual Emissions (21 Generators)

	Operational - Total Emissions (21 Generators)		
	Average* Daily	Annual	
Pollutant	**(lb/day)**	**(lb/yr)**	**(ton/yr)**
NOx	45.7	16,686	8.3
ROG	0.9	319	0.2
CO	3.5	1,276	0.6
PM10	0.1	41	0.02
PM2.5	0.1	39	0.02
SOx	0.04	15	0.01
CO_2	4284.6	1,563,862	781.9

* Average daily emissions calculated from total annual emissions and 365 days per year

Xilinx Equinix, Operational, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	573.00	1000sqft	18.00	573,000.00	0
Parking Lot	299.00	Space	0.00	79,220.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429.6	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioxidde Emission Intensity!

Land Use - From Site Plans

Construction Phase - For operational run

Trips and VMT -

Vehicle Trips - Trip Generation rate= 1.7 trip/ 1ksf (weekend trip generatin rate adjusted proportionally)

Energy Use - 30% reduction in title 24 values

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	1.00
tblEnergyUse	LightingElect	4.41	3.09
tblEnergyUse	T24E	7.46	5.22
tblEnergyUse	T24NG	17.16	12.01
tblEnergyUse	T24NG	0.00	0.62
tblLandUse	LandUseSquareFeet	119,600.00	79,220.00
tblLandUse	LotAcreage	13.15	18.00
tblLandUse	LotAcreage	2.69	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2014	2020
tblVehicleTrips	ST_TR	2.49	0.61
tblVehicleTrips	SU_TR	0.73	0.19
tblVehicleTrips	WD_TR	6.96	1.70

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Area	2.8480	7.0000e-005	8.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0156	0.0156	4.0000e-005	0.0000	0.0165
Energy	0.0376	0.3414	0.2868	2.0500e-003		0.0260	0.0260		0.0260	0.0260	0.0000	2,188.5307	2,188.5307	0.1298	0.0322	2,201.2345
Mobile	0.3659	0.7991	3.7329	0.0102	0.7408	0.0122	0.7529	0.1980	0.0112	0.2093	0.0000	708.4113	708.4113	0.0259	0.0000	708.9544
Waste						0.0000	0.0000		0.0000	0.0000	144.2291	0.0000	144.2291	8.5237	0.0000	323.2268
Water						0.0000	0.0000		0.0000	0.0000	42.0381	139.7153	181.7534	4.3272	0.1039	304.8332
Total	**3.2514**	**1.1406**	**4.0277**	**0.0123**	**0.7408**	**0.0382**	**0.7789**	**0.1980**	**0.0372**	**0.2352**	**186.2673**	**3,036.6729**	**3,222.9402**	**13.0065**	**0.1361**	**3,538.2653**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.8480	7.0000e-005	8.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0156	0.0156	4.0000e-005	0.0000	0.0165
Energy	0.0376	0.3414	0.2868	2.0500e-003		0.0260	0.0260		0.0260	0.0260	0.0000	2,188.5307	2,188.5307	0.1298	0.0322	2,201.2345
Mobile	0.3659	0.7991	3.7329	0.0102	0.7408	0.0122	0.7529	0.1980	0.0112	0.2093	0.0000	708.4113	708.4113	0.0259	0.0000	708.9544
Waste						0.0000	0.0000		0.0000	0.0000	144.2291	0.0000	144.2291	8.5237	0.0000	323.2268
Water						0.0000	0.0000		0.0000	0.0000	42.0381	139.7153	181.7534	4.3264	0.1037	304.7661
Total	**3.2514**	**1.1406**	**4.0277**	**0.0123**	**0.7408**	**0.0382**	**0.7789**	**0.1980**	**0.0372**	**0.2352**	**186.2673**	**3,036.6729**	**3,222.9402**	**13.0057**	**0.1359**	**3,538.1983**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.12**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3659	0.7991	3.7329	0.0102	0.7408	0.0122	0.7529	0.1980	0.0112	0.2093	0.0000	708.4113	708.4113	0.0259	0.0000	708.9544
Unmitigated	0.3659	0.7991	3.7329	0.0102	0.7408	0.0122	0.7529	0.1980	0.0112	0.2093	0.0000	708.4113	708.4113	0.0259	0.0000	708.9544

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	974.10	349.53	108.87	1,995,923	1,995,923
Parking Lot	0.00	0.00	0.00		
Total	974.10	349.53	108.87	1,995,923	1,995,923

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Industrial Park	9.50	7.30	7.30	59.00	28.00	13.00	79	19	2
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.551785	0.058740	0.185183	0.122735	0.029388	0.004432	0.012603	0.023662	0.001776	0.001268	0.006159	0.000502	0.001767

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,816.8397	1,816.8397	0.1227	0.0254	1,827.2814
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,816.8397	1,816.8397	0.1227	0.0254	1,827.2814
NaturalGas Mitigated	0.0376	0.3414	0.2868	2.0500e-003		0.0260	0.0260		0.0260	0.0260	0.0000	371.6910	371.6910	7.1200e-003	6.8100e-003	373.9531
NaturalGas Unmitigated	0.0376	0.3414	0.2868	2.0500e-003		0.0260	0.0260		0.0260	0.0260	0.0000	371.6910	371.6910	7.1200e-003	6.8100e-003	373.9531

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	49116.4	2.6000e-004	2.4100e-003	2.0200e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6210	2.6210	5.0000e-005	5.0000e-005	2.6370
Industrial Park	6.91611e+006	0.0373	0.3390	0.2848	2.0300e-003		0.0258	0.0258		0.0258	0.0258	0.0000	369.0700	369.0700	7.0700e-003	6.7700e-003	371.3161
Total		**0.0376**	**0.3414**	**0.2868**	**2.0400e-003**		**0.0260**	**0.0260**		**0.0260**	**0.0260**	**0.0000**	**371.6910**	**371.6910**	**7.1200e-003**	**6.8200e-003**	**373.9531**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	49116.4	2.6000e-004	2.4100e-003	2.0200e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6210	2.6210	5.0000e-005	5.0000e-005	2.6370
Industrial Park	6.91611e+006	0.0373	0.3390	0.2848	2.0300e-003		0.0258	0.0258		0.0258	0.0258	0.0000	369.0700	369.0700	7.0700e-003	6.7700e-003	371.3161
Total		**0.0376**	**0.3414**	**0.2868**	**2.0400e-003**		**0.0260**	**0.0260**		**0.0260**	**0.0260**	**0.0000**	**371.6910**	**371.6910**	**7.1200e-003**	**6.8200e-003**	**373.9531**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	9.25395e+006	1,803.2551	0.1217	0.0252	1,813.6188
Parking Lot	69713.6	13.5846	9.2000e-004	1.9000e-004	13.6627
Total		**1,816.8397**	**0.1227**	**0.0254**	**1,827.2814**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	9.25395e+006	1,803.2551	0.1217	0.0252	1,813.6188
Parking Lot	69713.6	13.5846	9.2000e-004	1.9000e-004	13.6627
Total		**1,816.8397**	**0.1227**	**0.0254**	**1,827.2814**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.8480	7.0000e-005	8.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0156	0.0156	4.0000e-005	0.0000	0.0165
Unmitigated	2.8480	7.0000e-005	8.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0156	0.0156	4.0000e-005	0.0000	0.0165

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.5473					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.6000e-004	7.0000e-005	8.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0156	0.0156	4.0000e-005	0.0000	0.0165
Total	**2.8480**	**7.0000e-005**	**8.0600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0156**	**0.0156**	**4.0000e-005**	**0.0000**	**0.0165**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.5473					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.6000e-004	7.0000e-005	8.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0156	0.0156	4.0000e-005	0.0000	0.0165
Total	**2.8480**	**7.0000e-005**	**8.0600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0156**	**0.0156**	**4.0000e-005**	**0.0000**	**0.0165**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	181.7534	4.3264	0.1037	304.7661
Unmitigated	181.7534	4.3272	0.1039	304.8332

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	132.506 / 0	181.7534	4.3272	0.1039	304.8332
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**181.7534**	**4.3272**	**0.1039**	**304.8332**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	132.506 / 0	181.7534	4.3264	0.1037	304.7661
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**181.7534**	**4.3264**	**0.1037**	**304.7661**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Unmitigated	144.2291	8.5237	0.0000	323.2268
Mitigated	144.2291	8.5237	0.0000	323.2268

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	710.52	144.2291	8.5237	0.0000	323.2268
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**144.2291**	**8.5237**	**0.0000**	**323.2268**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	710.52	144.2291	8.5237	0.0000	323.2268
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**144.2291**	**8.5237**	**0.0000**	**323.2268**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Attachment 3: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[6] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[7] This HRA used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. While the OEHHA guidelines use substantially more conservative assumptions than the current Bay Area Air Quality Management District (BAAQMD) guidelines, BAAQMD has not formally adopted recommended procedures for applying the newest OEHHA guidelines. BAAQMD is in the process of developing new guidance and has developed proposed HRA Guidelines as part of the proposed amendments to Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.[8] Exposure parameters from the OEHHA guidelines and newly proposed BAAQMD HRA Guidelines were used in this evaluation.

<u>Cancer Risk</u>

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure, and the exposure duration. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 95^{th} percentile breathing rates are used for the third trimester and infant exposures, and 80^{th} percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

Under previous OEHHA and BAAQMD HRA guidance, residential receptors are assumed to be at their home 24 hours a day, or 100 percent of the time. In the 2015 Risk Assessment Guidance, OEHHA includes adjustments to exposure duration to account for the fraction of time at home (FAH), which can be less than 100 percent of the time, based on updated population and activity statistics. The FAH factors are age-specific and are: 0.85 for third trimester of pregnancy to less than 2 years old, 0.72 for ages 2 to less than 16 years, and 0.73 for ages 16 to 70 years. BAAQMD recommends using these FAH factors for residential exposures.

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^6$

Where:

[6] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

[7] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

[8] BAAQMD, 2016. *Workshop Report. Proposed Amendments to Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants. Appendix C. Proposed Air District HRA Guidelines*. January 2016.

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air} \times DBR \times A \times (EF/365) \times 10^{-6}$

Where:

C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized as follows:

Parameter	*Exposure Type →* / *Age Range →*	Infant		Child	Adult
		3rd Trimester	0<2	2 < 16	16 - 30
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	572	261
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14
Exposure Frequency (days/year)		350	350	350	350
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home		0.85 – 1.0	0.72 – 1.0	0.72 -1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults

Non-Cancer Hazards

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter ($\mu g/m^3$).

Annual $PM_{2.5}$ Concentrations

While not a TAC, fine particulate matter ($PM_{2.5}$) has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA). The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

Attachment 4: Construction Health Risk Assessment

- **Dispersion Modeling and Emissions Rates**
- **Cancer Risk Calculations**
- **CalEEMod On- and Near Site Emissions Output**

Xilinx SV-12, SV-13 and SV-14, San Jose, CA

DPM Construction Emissions and Modeling Emission Rates

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2016	Site Preparation	0.0694	PREP_DPM	138.9	0.04228	5.33E-03	74,168	7.18E-08
	SV-12 Const	0.0293	SV12_DPM	58.6	0.01785	2.25E-03	22,433	1.00E-07
	Subtotal	*0.0988*		*197.5*	*0.06013*	*7.58E-03*		
2017	SV-12 Const	0.2049	SV12_DPM	409.8	0.12476	1.57E-02	22,433	7.01E-07
	SV-13 Const	0.0030	SV13_DPM	6.1	0.00185	2.33E-04	30,258	7.69E-09
	Subtotal	*0.2079*		*415.9*	*0.12661*	*1.60E-02*		
2018	SV-13 Const	0.1845	SV13_DPM	369.1	0.11234	1.42E-02	30,258	4.68E-07
2019	SV-13 Const	0.0062	SV13_DPM	12.3	0.00375	4.73E-04	30,258	1.56E-08
	SV-14 Const	0.1541	SV14_DPM	308.2	0.09382	1.18E-02	21,356	5.54E-07
	Subtotal	*0.1603*		*320.5*	*0.09757*	*1.23E-02*		
2020	SV-14 Const	0.0116	SV14_DPM	23.1	0.00705	8.88E-04	21,356	4.16E-08
Total		**0.6631**		**1326**	**0.4037**	**0.0509**		
		hr/day =	9	(7am - 4pm)				
		days/yr =	365					
		hours/year =	3285					

PM2.5 Fugitive Dust Construction Emissions for Modeling

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2016	Site Preparation	PREP_FUG	0.1142	228.4	0.06953	8.76E-03	74,168	1.18E-07
	SV-12 Const	SV12_FUG	0.0002	0.4	0.00011	1.44E-05	22,433	6.41E-10
	Subtotal		*0.1144*	*228.8*	*0.06964*	*8.77E-03*		
2017	SV-12 Const	SV12_FUG	0.0016	3.2	0.00098	1.23E-04	22,433	5.50E-09
	SV-13 Const	SV13_FUG	0.0000	0.0	0.00000	0.00E+00	30,258	0.00E+00
	Subtotal		*0.0016*	*3.2*	*0.00098*	*1.23E-04*		
2018	SV-13 Const	SV13_FUG	0.0018	3.6	0.00109	1.37E-04	30,258	4.53E-09
2019	SV-13 Const	SV13_FUG	0.0000	0.0	0.00001	8.46E-07	30,258	2.79E-11
	SV-14 Const	SV14_FUG	0.0018	3.6	0.00111	1.40E-04	21,356	6.53E-09
	Subtotal		*0.0018*	*3.7*	*0.00111*	*1.40E-04*		
2020	SV-14 Const	SV14_FUG	0.0001	0.1	0.00004	5.07E-06	21,356	2.38E-10
Total			**0.1197**	**239.4**	**0.0729**	**0.0092**		
		hr/day =	9	(7am - 4pm)				
		days/yr =	365					
		hours/year =	3285					

Xilinx SV-12, SV-13 and SV-14, San Jose, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult		
	Exposure				Age	Cancer	Modeled		Age	Cancer		
Exposure	Duration		DPM Conc (ug/m3)		Sensitivity	Risk	DPM Conc (ug/m3)		Sensitivity	Risk	Fugitive	Total
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	PM2.5	PM2.5
0	0.25	-0.25 - 0*	2016	0.0059	10	0.08	2016	0.0059	-	-	-	-
1	1	0 - 1	2016	0.0059	10	0.97	2016	0.0059	1	0.02	0.0060	0.012
2	1	1 - 2	2017	0.0181	10	2.97	2017	0.0181	1	0.05	0.0001	0.018
3	1	2 - 3	2018	0.0094	3	0.24	2018	0.0094	1	0.03	0.0001	0.009
4	1	3 - 4		0.0070	3	0.18	2019	0.0070	1	0.02	0.0001	0.007
5	1	4 - 5		0.0005	3	0.01	2020	0.0005	1	0.00	0.0000	0.001
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**4.5**				**0.1**		

* Third trimester of pregnancy

Santa Teresa Substation, San Jose, CA

DPM Construction Emissions and Modeling Emission Rates

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2018	Substation	0.01168	SUB_DPM	23.4	0.00711	8.96E-04	8,477	1.06E-07
2019	Substation	0.00171	SUB_DPM	3.4	0.00104	1.31E-04	8,477	1.55E-08
Total		**0.0134**		**26.8**	**0.0082**	**0.0010**		
		hr/day =	9	(7am - 4pm)				
		days/yr =	365					
		hours/year =	3285					

PM2.5 Fugitive Dust Construction Emissions for Modeling

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2018	Substation	SUB_FUG	0.01675	33.5	0.01020	1.29E-03	8,477	1.52E-07
2019	Substation	SUB_FUG	0.00002	0.0	0.00001	1.69E-06	8,477	2.00E-10
Total			**0.0168**	**33.6**	**0.0102**	**0.0013**		
		hr/day =	9	(7am - 4pm)				
		days/yr =	365					
		hours/year =	3285					

Santa Teresa Substation, San Jose, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult		
	Exposure				**Age**	**Cancer**	**Modeled**		**Age**	**Cancer**		
Exposure	**Duration**		**DPM Conc (ug/m3)**		**Sensitivity**	**Risk**	**DPM Conc (ug/m3)**		**Sensitivity**	**Risk**	**Fugitive**	**Total**
Year	**(years)**	**Age**	**Year**	**Annual**	**Factor**	**(per million)**	**Year**	**Annual**	**Factor**	**(per million)**	**PM2.5**	**PM2.5**
0	0.25	-0.25 - 0*		-	10	-	-	-	-	-	-	-
1	1	0 - 1	2018	0.0008	10	0.13	2018	0.0008	1	0.00	0.0012	0.002
2	1	1 - 2	2019	0.0001	10	0.02	2019	0.0001	1	0.00	0.0000	0.000
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**0.1**				**0.0**		

* Third trimester of pregnancy

Equinix Xilinx, Site Work, TAC

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	573.00	1000sqft	18.00	573,000.00	0
Parking Lot	299.00	Space	0.00	79,220.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioxide Emission Intensity Standard

Land Use - From Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment -

Off-road Equipment -

Trips and VMT - For TAC, trip distance=0.5mile

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblLandUse	LandUseSquareFeet	119,600.00	79,220.00
tblLandUse	LotAcreage	13.15	18.00
tblLandUse	LotAcreage	2.69	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.1236	1.3957	0.9464	1.1200e-003	0.2206	0.0685	0.2890	0.1036	0.0630	0.1666	0.0000	105.9353	105.9353	0.0319	0.0000	106.6055
Total	**0.1236**	**1.3957**	**0.9464**	**1.1200e-003**	**0.2206**	**0.0685**	**0.2890**	**0.1036**	**0.0630**	**0.1666**	**0.0000**	**105.9353**	**105.9353**	**0.0319**	**0.0000**	**106.6055**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0356	0.9366	0.6899	1.1200e-003	0.0993	0.0255	0.1248	0.0234	0.0255	0.0488	0.0000	105.9352	105.9352	0.0319	0.0000	106.6053
Total	**0.0356**	**0.9366**	**0.6899**	**1.1200e-003**	**0.0993**	**0.0255**	**0.1248**	**0.0234**	**0.0255**	**0.0488**	**0.0000**	**105.9352**	**105.9352**	**0.0319**	**0.0000**	**106.6053**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**71.22**	**32.89**	**27.10**	**0.00**	**54.96**	**62.78**	**56.82**	**77.47**	**59.54**	**70.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	11/1/2016	11/14/2016	5	10	
2	Grading	Grading	11/15/2016	12/26/2016	5	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	162	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0254	0.2732	0.2055	2.0000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	18.4386	18.4386	5.5600e-003	0.0000	18.5554
Total	**0.0254**	**0.2732**	**0.2055**	**2.0000e-004**	**0.0903**	**0.0147**	**0.1050**	**0.0497**	**0.0135**	**0.0632**	**0.0000**	**18.4386**	**18.4386**	**5.5600e-003**	**0.0000**	**18.5554**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	7.0000e-005	8.7000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0469	0.0469	0.0000	0.0000	0.0470
Total	**2.4000e-004**	**7.0000e-005**	**8.7000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0469**	**0.0469**	**0.0000**	**0.0000**	**0.0470**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1500e-003	0.1721	0.1170	2.0000e-004		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	18.4385	18.4385	5.5600e-003	0.0000	18.5553
Total	**6.1500e-003**	**0.1721**	**0.1170**	**2.0000e-004**	**0.0407**	**4.8100e-003**	**0.0455**	**0.0112**	**4.8100e-003**	**0.0160**	**0.0000**	**18.4385**	**18.4385**	**5.5600e-003**	**0.0000**	**18.5553**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	7.0000e-005	8.7000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0469	0.0469	0.0000	0.0000	0.0470
Total	**2.4000e-004**	**7.0000e-005**	**8.7000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0469**	**0.0469**	**0.0000**	**0.0000**	**0.0470**

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0972	1.1222	0.7371	9.3000e-004		0.0538	0.0538		0.0495	0.0495	0.0000	87.2936	87.2936	0.0263	0.0000	87.8465
Total	**0.0972**	**1.1222**	**0.7371**	**9.3000e-004**	**0.1301**	**0.0538**	**0.1839**	**0.0540**	**0.0495**	**0.1034**	**0.0000**	**87.2936**	**87.2936**	**0.0263**	**0.0000**	**87.8465**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-004	2.2000e-004	2.9000e-003	0.0000	1.1000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1563	0.1563	1.0000e-005	0.0000	0.1566
Total	**8.0000e-004**	**2.2000e-004**	**2.9000e-003**	**0.0000**	**1.1000e-004**	**0.0000**	**1.2000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1563**	**0.1563**	**1.0000e-005**	**0.0000**	**0.1566**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0586	0.0000	0.0586	0.0121	0.0000	0.0121	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0284	0.7642	0.5692	9.3000e-004		0.0207	0.0207		0.0207	0.0207	0.0000	87.2935	87.2935	0.0263	0.0000	87.8464
Total	**0.0284**	**0.7642**	**0.5692**	**9.3000e-004**	**0.0586**	**0.0207**	**0.0792**	**0.0121**	**0.0207**	**0.0328**	**0.0000**	**87.2935**	**87.2935**	**0.0263**	**0.0000**	**87.8464**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-004	2.2000e-004	2.9000e-003	0.0000	1.1000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1563	0.1563	1.0000e-005	0.0000	0.1566
Total	**8.0000e-004**	**2.2000e-004**	**2.9000e-003**	**0.0000**	**1.1000e-004**	**0.0000**	**1.2000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1563**	**0.1563**	**1.0000e-005**	**0.0000**	**0.1566**

Xilinx Equinix, SV-12, TAC, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	191.00	1000sqft	2.93	191,000.00	0
Parking Lot	86.00	Space	0.00	22,786.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429.6	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioixde Emission Intensity

Land Use - From Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Trips and VMT - For TAC, trip lengths= 0.5 mile

Grading -

Architectural Coating -

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	NumDays	220.00	230.00
tblConstructionPhase	NumDays	6.00	20.00
tblConstructionPhase	NumDays	10.00	20.00
tblLandUse	LandUseSquareFeet	34,400.00	22,786.00
tblLandUse	LotAcreage	4.38	2.93
tblLandUse	LotAcreage	0.77	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					

2016	0.0547	0.4307	0.3393	4.3000e-004	6.2000e-004	0.0284	0.0290	1.7000e-004	0.0266	0.0267	0.0000	38.8100	38.8100	9.6700e-003	0.0000	39.0131
2017	1.3924	3.0536	2.5134	3.2300e-003	5.2900e-003	0.1981	0.2034	1.4600e-003	0.1859	0.1874	0.0000	287.5368	287.5368	0.0685	0.0000	288.9742
Total	**1.4471**	**3.4843**	**2.8527**	**3.6600e-003**	**5.9100e-003**	**0.2265**	**0.2324**	**1.6300e-003**	**0.2125**	**0.2141**	**0.0000**	**326.3468**	**326.3468**	**0.0781**	**0.0000**	**327.9873**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0285	0.3700	0.3419	4.3000e-004	6.2000e-004	0.0140	0.0146	1.7000e-004	0.0140	0.0142	0.0000	38.8099	38.8099	9.6700e-003	0.0000	39.0130
2017	1.2117	2.7518	2.5454	3.2300e-003	5.2900e-003	0.1042	0.1095	1.4600e-003	0.1041	0.1056	0.0000	287.5365	287.5365	0.0685	0.0000	288.9739
Total	**1.2402**	**3.1218**	**2.8873**	**3.6600e-003**	**5.9100e-003**	**0.1182**	**0.1241**	**1.6300e-003**	**0.1181**	**0.1198**	**0.0000**	**326.3464**	**326.3464**	**0.0781**	**0.0000**	**327.9869**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**14.30**	**10.40**	**-1.21**	**0.00**	**0.00**	**47.81**	**46.59**	**0.00**	**44.41**	**44.08**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	11/1/2016	11/28/2016	5	20	
2	Building Construction	Building Construction	11/29/2016	10/16/2017	5	230	
3	Architectural Coating	Architectural Coating	10/17/2017	11/13/2017	5	20	
4	Paving	Paving	11/14/2017	12/11/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 287,525; Non-Residential Outdoor: 95,842 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	162	0.38
Grading	Graders	0	0.00	174	0.41
Grading	Rubber Tired Dozers	0	0.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	62	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36

Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	2	5.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Building Construction	9	90.00	35.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	18.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2900e-003	0.0769	0.0584	8.0000e-005		4.6900e-003	4.6900e-003		4.3100e-003	4.3100e-003	0.0000	7.9251	7.9251	2.3900e-003	0.0000	7.9753
Total	**7.2900e-003**	**0.0769**	**0.0584**	**8.0000e-005**	**0.0000**	**4.6900e-003**	**4.6900e-003**	**0.0000**	**4.3100e-003**	**4.3100e-003**	**0.0000**	**7.9251**	**7.9251**	**2.3900e-003**	**0.0000**	**7.9753**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	4.0000e-005	4.8000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0261	0.0261	0.0000	0.0000	0.0261
Total	**1.3000e-004**	**4.0000e-005**	**4.8000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0261**	**0.0261**	**0.0000**	**0.0000**	**0.0261**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5200e-003	0.0753	0.0636	8.0000e-005		2.6100e-003	2.6100e-003		2.6100e-003	2.6100e-003	0.0000	7.9251	7.9251	2.3900e-003	0.0000	7.9753
Total	**3.5200e-003**	**0.0753**	**0.0636**	**8.0000e-005**	**0.0000**	**2.6100e-003**	**2.6100e-003**	**0.0000**	**2.6100e-003**	**2.6100e-003**	**0.0000**	**7.9251**	**7.9251**	**2.3900e-003**	**0.0000**	**7.9753**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	4.0000e-005	4.8000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0261	0.0261	0.0000	0.0000	0.0261
Total	**1.3000e-004**	**4.0000e-005**	**4.8000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0261**	**0.0261**	**0.0000**	**0.0000**	**0.0261**

3.3 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0409	0.3421	0.2221	3.2000e-004		0.0236	0.0236		0.0222	0.0222	0.0000	29.0584	29.0584	7.2100e-003	0.0000	29.2098
Total	**0.0409**	**0.3421**	**0.2221**	**3.2000e-004**		**0.0236**	**0.0236**		**0.0222**	**0.0222**	**0.0000**	**29.0584**	**29.0584**	**7.2100e-003**	**0.0000**	**29.2098**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.5200e-003	0.0110	0.0479	1.0000e-005	2.0000e-004	7.0000e-005	2.7000e-004	6.0000e-005	7.0000e-005	1.2000e-004	0.0000	1.2377	1.2377	2.0000e-005	0.0000	1.2381
Worker	2.8600e-003	7.8000e-004	0.0105	1.0000e-005	4.1000e-004	1.0000e-005	4.2000e-004	1.1000e-004	1.0000e-005	1.2000e-004	0.0000	0.5626	0.5626	5.0000e-005	0.0000	0.5637
Total	**6.3800e-003**	**0.0117**	**0.0584**	**2.0000e-005**	**6.1000e-004**	**8.0000e-005**	**6.9000e-004**	**1.7000e-004**	**8.0000e-005**	**2.4000e-004**	**0.0000**	**1.8004**	**1.8004**	**7.0000e-005**	**0.0000**	**1.8018**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0184	0.2829	0.2195	3.2000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	29.0584	29.0584	7.2100e-003	0.0000	29.2097
Total	**0.0184**	**0.2829**	**0.2195**	**3.2000e-004**		**0.0113**	**0.0113**		**0.0113**	**0.0113**	**0.0000**	**29.0584**	**29.0584**	**7.2100e-003**	**0.0000**	**29.2097**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.5200e-003	0.0110	0.0479	1.0000e-005	2.0000e-004	7.0000e-005	2.7000e-004	6.0000e-005	7.0000e-005	1.2000e-004	0.0000	1.2377	1.2377	2.0000e-005	0.0000	1.2381
Worker	2.8600e-003	7.8000e-004	0.0105	1.0000e-005	4.1000e-004	1.0000e-005	4.2000e-004	1.1000e-004	1.0000e-005	1.2000e-004	0.0000	0.5626	0.5626	5.0000e-005	0.0000	0.5637
Total	**6.3800e-003**	**0.0117**	**0.0584**	**2.0000e-005**	**6.1000e-004**	**8.0000e-005**	**6.9000e-004**	**1.7000e-004**	**8.0000e-005**	**2.4000e-004**	**0.0000**	**1.8004**	**1.8004**	**7.0000e-005**	**0.0000**	**1.8018**

3.3 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3195	2.7198	1.8673	2.7600e-003		0.1835	0.1835		0.1723	0.1723	0.0000	246.6635	246.6635	0.0607	0.0000	247.9384
Total	**0.3195**	**2.7198**	**1.8673**	**2.7600e-003**		**0.1835**	**0.1835**		**0.1723**	**0.1723**	**0.0000**	**246.6635**	**246.6635**	**0.0607**	**0.0000**	**247.9384**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0259	0.0875	0.3796	1.2000e-004	1.6800e-003	5.2000e-004	2.2000e-003	4.9000e-004	4.8000e-004	9.7000e-004	0.0000	10.4311	10.4311	1.5000e-004	0.0000	10.4343
Worker	0.0227	6.0000e-003	0.0806	6.0000e-005	3.4900e-003	1.0000e-004	3.5900e-003	9.4000e-004	9.0000e-005	1.0300e-003	0.0000	4.6466	4.6466	4.1000e-004	0.0000	4.6551
Total	**0.0486**	**0.0935**	**0.4602**	**1.8000e-004**	**5.1700e-003**	**6.2000e-004**	**5.7900e-003**	**1.4300e-003**	**5.7000e-004**	**2.0000e-003**	**0.0000**	**15.0776**	**15.0776**	**5.6000e-004**	**0.0000**	**15.0893**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	0.1517	2.4217	1.8778	2.7600e-003		0.0955	0.0955		0.0955	0.0955	0.0000	246.6632	246.6632	0.0607	0.0000	247.9381
Total	**0.1517**	**2.4217**	**1.8778**	**2.7600e-003**		**0.0955**	**0.0955**		**0.0955**	**0.0955**	**0.0000**	**246.6632**	**246.6632**	**0.0607**	**0.0000**	**247.9381**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0259	0.0875	0.3796	1.2000e-004	1.6800e-003	5.2000e-004	2.2000e-003	4.9000e-004	4.8000e-004	9.7000e-004	0.0000	10.4311	10.4311	1.5000e-004	0.0000	10.4343
Worker	0.0227	6.0000e-003	0.0806	6.0000e-005	3.4900e-003	1.0000e-004	3.5900e-003	9.4000e-004	9.0000e-005	1.0300e-003	0.0000	4.6466	4.6466	4.1000e-004	0.0000	4.6551
Total	**0.0486**	**0.0935**	**0.4602**	**1.8000e-004**	**5.1700e-003**	**6.2000e-004**	**5.7900e-003**	**1.4300e-003**	**5.7000e-004**	**2.0000e-003**	**0.0000**	**15.0776**	**15.0776**	**5.6000e-004**	**0.0000**	**15.0893**

3.4 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9100e-003	0.0372	0.0357	6.0000e-005		2.5900e-003	2.5900e-003		2.5700e-003	2.5700e-003	0.0000	4.9368	4.9368	8.3000e-004	0.0000	4.9543
Total	**1.0044**	**0.0372**	**0.0357**	**6.0000e-005**		**2.5900e-003**	**2.5900e-003**		**2.5700e-003**	**2.5700e-003**	**0.0000**	**4.9368**	**4.9368**	**8.3000e-004**	**0.0000**	**4.9543**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	1.2000e-004	1.5700e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0902	0.0902	1.0000e-005	0.0000	0.0904
Total	**4.4000e-004**	**1.2000e-004**	**1.5700e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0902**	**0.0902**	**1.0000e-005**	**0.0000**	**0.0904**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Archit. Coating	0.9995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-003	0.0394	0.0352	6.0000e-005		1.5500e-003	1.5500e-003		1.5300e-003	1.5300e-003	0.0000	4.9368	4.9368	8.3000e-004	0.0000	4.9542
Total	**1.0015**	**0.0394**	**0.0352**	**6.0000e-005**		**1.5500e-003**	**1.5500e-003**		**1.5300e-003**	**1.5300e-003**	**0.0000**	**4.9368**	**4.9368**	**8.3000e-004**	**0.0000**	**4.9542**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	1.2000e-004	1.5700e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0902	0.0902	1.0000e-005	0.0000	0.0904
Total	**4.4000e-004**	**1.2000e-004**	**1.5700e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0902**	**0.0902**	**1.0000e-005**	**0.0000**	**0.0904**

3.5 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8266
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0191**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8266**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	1.0000e-004	1.3000e-003	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0752	0.0752	1.0000e-005	0.0000	0.0753
Total	**3.7000e-004**	**1.0000e-004**	**1.3000e-003**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0752**	**0.0752**	**1.0000e-005**	**0.0000**	**0.0753**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	9.1200e-003	0.1970	0.1693	2.2000e-004		6.5400e-003	6.5400e-003		6.5400e-003	6.5400e-003	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8265
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.1200e-003**	**0.1970**	**0.1693**	**2.2000e-004**		**6.5400e-003**	**6.5400e-003**		**6.5400e-003**	**6.5400e-003**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8265**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	1.0000e-004	1.3000e-003	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0752	0.0752	1.0000e-005	0.0000	0.0753
Total	**3.7000e-004**	**1.0000e-004**	**1.3000e-003**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0752**	**0.0752**	**1.0000e-005**	**0.0000**	**0.0753**

SV13, TAC, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	191.00	1000sqft	2.93	191,000.00	0
Parking Lot	86.00	Space	0.00	22,786.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429.6	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioxide Emission Intensity

Land Use - From the Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Trips and VMT - for TAC, trip distance= 0.5 miles

Grading -

Architectural Coating -

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	NumDays	220.00	230.00
tblConstructionPhase	NumDays	6.00	20.00
tblConstructionPhase	NumDays	10.00	20.00
tblLandUse	LandUseSquareFeet	34,400.00	22,786.00
tblLandUse	LotAcreage	4.38	2.93
tblLandUse	LotAcreage	0.77	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					

2017	4.8400e-003	0.0495	0.0410	6.0000e-005	1.0000e-005	2.9900e-003	3.0000e-003	0.0000	2.7500e-003	2.7500e-003	0.0000	5.4758	5.4758	1.6700e-003	0.0000	5.5109
2018	1.3659	2.8667	2.5872	3.4300e-003	5.8600e-003	0.1781	0.1839	1.6200e-003	0.1674	0.1690	0.0000	301.1354	301.1354	0.0703	0.0000	302.6120
2019	0.0109	0.1121	0.1085	1.7000e-004	4.0000e-005	6.0700e-003	6.1100e-003	1.0000e-005	5.5900e-003	5.6000e-003	0.0000	15.0820	15.0820	4.7600e-003	0.0000	15.1819
Total	**1.3817**	**3.0282**	**2.7368**	**3.6600e-003**	**5.9100e-003**	**0.1871**	**0.1930**	**1.6300e-003**	**0.1758**	**0.1774**	**0.0000**	**321.6931**	**321.6931**	**0.0768**	**0.0000**	**323.3049**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	2.5500e-003	0.0528	0.0448	6.0000e-005	1.0000e-005	1.8200e-003	1.8400e-003	0.0000	1.8200e-003	1.8300e-003	0.0000	5.4758	5.4758	1.6700e-003	0.0000	5.5109
2018	1.2168	2.9050	2.6692	3.4300e-003	5.8600e-003	0.1095	0.1154	1.6200e-003	0.1094	0.1111	0.0000	301.1351	301.1351	0.0703	0.0000	302.6117
2019	7.0800e-003	0.1478	0.1278	1.7000e-004	4.0000e-005	4.9100e-003	4.9500e-003	1.0000e-005	4.9100e-003	4.9200e-003	0.0000	15.0819	15.0819	4.7600e-003	0.0000	15.1819
Total	**1.2264**	**3.1055**	**2.8418**	**3.6600e-003**	**5.9100e-003**	**0.1162**	**0.1222**	**1.6300e-003**	**0.1162**	**0.1178**	**0.0000**	**321.6928**	**321.6928**	**0.0768**	**0.0000**	**323.3045**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**11.24**	**-2.55**	**-3.84**	**0.00**	**0.00**	**37.88**	**36.72**	**0.00**	**33.90**	**33.59**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	12/12/2017	1/8/2018	5	20	
2	Building Construction	Building Construction	1/9/2018	11/26/2018	5	230	
3	Architectural Coating	Architectural Coating	11/27/2018	12/24/2018	5	20	
4	Paving	Paving	12/25/2018	1/21/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 287,525; Non-Residential Outdoor: 95,842 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	162	0.38
Grading	Graders	0	0.00	174	0.41
Grading	Rubber Tired Dozers	0	0.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	62	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48

Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	2	5.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Building Construction	9	90.00	35.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	18.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7500e-003	0.0494	0.0407	6.0000e-005		2.9900e-003	2.9900e-003		2.7500e-003	2.7500e-003	0.0000	5.4583	5.4583	1.6700e-003	0.0000	5.4934
Total	**4.7500e-003**	**0.0494**	**0.0407**	**6.0000e-005**	**0.0000**	**2.9900e-003**	**2.9900e-003**	**0.0000**	**2.7500e-003**	**2.7500e-003**	**0.0000**	**5.4583**	**5.4583**	**1.6700e-003**	**0.0000**	**5.4934**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0175	0.0175	0.0000	0.0000	0.0176
Total	**9.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0175**	**0.0175**	**0.0000**	**0.0000**	**0.0176**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4600e-003	0.0527	0.0445	6.0000e-005		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003	0.0000	5.4582	5.4582	1.6700e-003	0.0000	5.4934
Total	**2.4600e-003**	**0.0527**	**0.0445**	**6.0000e-005**	**0.0000**	**1.8200e-003**	**1.8200e-003**	**0.0000**	**1.8200e-003**	**1.8200e-003**	**0.0000**	**5.4582**	**5.4582**	**1.6700e-003**	**0.0000**	**5.4934**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0175	0.0175	0.0000	0.0000	0.0176
Total	**9.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0175**	**0.0175**	**0.0000**	**0.0000**	**0.0176**

3.2 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6900e-003	0.0174	0.0171	3.0000e-005		1.0200e-003	1.0200e-003		9.4000e-004	9.4000e-004	0.0000	2.3011	2.3011	7.2000e-004	0.0000	2.3162
Total	**1.6900e-003**	**0.0174**	**0.0171**	**3.0000e-005**	**0.0000**	**1.0200e-003**	**1.0200e-003**	**0.0000**	**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.3011**	**2.3011**	**7.2000e-004**	**0.0000**	**2.3162**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	1.0000e-005	1.2000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	7.2400e-003	7.2400e-003	0.0000	0.0000	7.2500e-003
Total	**3.0000e-005**	**1.0000e-005**	**1.2000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**7.2400e-003**	**7.2400e-003**	**0.0000**	**0.0000**	**7.2500e-003**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0600e-003	0.0226	0.0191	3.0000e-005		7.8000e-004	7.8000e-004		7.8000e-004	7.8000e-004	0.0000	2.3011	2.3011	7.2000e-004	0.0000	2.3162
Total	**1.0600e-003**	**0.0226**	**0.0191**	**3.0000e-005**	**0.0000**	**7.8000e-004**	**7.8000e-004**	**0.0000**	**7.8000e-004**	**7.8000e-004**	**0.0000**	**2.3011**	**2.3011**	**7.2000e-004**	**0.0000**	**2.3162**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	1.0000e-005	1.2000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	7.2400e-003	7.2400e-003	0.0000	0.0000	7.2500e-003
Total	**3.0000e-005**	**1.0000e-005**	**1.2000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**7.2400e-003**	**7.2400e-003**	**0.0000**	**0.0000**	**7.2500e-003**

3.3 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.6750	2.0163	3.0800e-003		0.1718	0.1718		0.1616	0.1616	0.0000	272.2851	272.2851	0.0666	0.0000	273.6844
Total	**0.3069**	**2.6750**	**2.0163**	**3.0800e-003**		**0.1718**	**0.1718**		**0.1616**	**0.1616**	**0.0000**	**272.2851**	**272.2851**	**0.0666**	**0.0000**	**273.6844**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0254	0.0915	0.3993	1.4000e-004	1.8700e-003	5.3000e-004	2.4000e-003	5.5000e-004	4.9000e-004	1.0300e-003	0.0000	11.4364	11.4364	1.7000e-004	0.0000	11.4400
Worker	0.0234	5.9900e-003	0.0811	7.0000e-005	3.9000e-003	1.1000e-004	4.0100e-003	1.0500e-003	1.0000e-004	1.1500e-003	0.0000	4.9957	4.9957	4.1000e-004	0.0000	5.0042
Total	**0.0489**	**0.0975**	**0.4804**	**2.1000e-004**	**5.7700e-003**	**6.4000e-004**	**6.4100e-003**	**1.6000e-003**	**5.9000e-004**	**2.1800e-003**	**0.0000**	**16.4321**	**16.4321**	**5.8000e-004**	**0.0000**	**16.4442**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1626	2.6971	2.0904	3.0800e-003		0.1050	0.1050		0.1050	0.1050	0.0000	272.2848	272.2848	0.0666	0.0000	273.6841
Total	**0.1626**	**2.6971**	**2.0904**	**3.0800e-003**		**0.1050**	**0.1050**		**0.1050**	**0.1050**	**0.0000**	**272.2848**	**272.2848**	**0.0666**	**0.0000**	**273.6841**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0254	0.0915	0.3993	1.4000e-004	1.8700e-003	5.3000e-004	2.4000e-003	5.5000e-004	4.9000e-004	1.0300e-003	0.0000	11.4364	11.4364	1.7000e-004	0.0000	11.4400
Worker	0.0234	5.9900e-003	0.0811	7.0000e-005	3.9000e-003	1.1000e-004	4.0100e-003	1.0500e-003	1.0000e-004	1.1500e-003	0.0000	4.9957	4.9957	4.1000e-004	0.0000	5.0042
Total	**0.0489**	**0.0975**	**0.4804**	**2.1000e-004**	**5.7700e-003**	**6.4000e-004**	**6.4100e-003**	**1.6000e-003**	**5.9000e-004**	**2.1800e-003**	**0.0000**	**16.4321**	**16.4321**	**5.8000e-004**	**0.0000**	**16.4442**

3.4 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4000e-003	0.0337	0.0355	6.0000e-005		2.2000e-003	2.2000e-003		2.1900e-003	2.1900e-003	0.0000	4.9127	4.9127	7.9000e-004	0.0000	4.9293
Total	**1.0039**	**0.0337**	**0.0355**	**6.0000e-005**		**2.2000e-003**	**2.2000e-003**		**2.1900e-003**	**2.1900e-003**	**0.0000**	**4.9127**	**4.9127**	**7.9000e-004**	**0.0000**	**4.9293**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	1.0000e-004	1.4100e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0869	0.0869	1.0000e-005	0.0000	0.0870
Total	**4.1000e-004**	**1.0000e-004**	**1.4100e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0869**	**0.0869**	**1.0000e-005**	**0.0000**	**0.0870**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9300e-003	0.0384	0.0352	6.0000e-005		1.4600e-003	1.4600e-003		1.4500e-003	1.4500e-003	0.0000	4.9126	4.9126	7.9000e-004	0.0000	4.9293
Total	**1.0014**	**0.0384**	**0.0352**	**6.0000e-005**		**1.4600e-003**	**1.4600e-003**		**1.4500e-003**	**1.4500e-003**	**0.0000**	**4.9126**	**4.9126**	**7.9000e-004**	**0.0000**	**4.9293**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	1.0000e-004	1.4100e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0869	0.0869	1.0000e-005	0.0000	0.0870
Total	**4.1000e-004**	**1.0000e-004**	**1.4100e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0869**	**0.0869**	**1.0000e-005**	**0.0000**	**0.0870**

3.5 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.0300e-003	0.0429	0.0362	6.0000e-005		2.3500e-003	2.3500e-003		2.1600e-003	2.1600e-003	0.0000	5.0922	5.0922	1.5900e-003	0.0000	5.1255
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.0300e-003**	**0.0429**	**0.0362**	**6.0000e-005**		**2.3500e-003**	**2.3500e-003**		**2.1600e-003**	**2.1600e-003**	**0.0000**	**5.0922**	**5.0922**	**1.5900e-003**	**0.0000**	**5.1255**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	2.0000e-005	2.9000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0181	0.0181	0.0000	0.0000	0.0181
Total	**8.0000e-005**	**2.0000e-005**	**2.9000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0181**	**0.0181**	**0.0000**	**0.0000**	**0.0181**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2800e-003	0.0493	0.0423	6.0000e-005		1.6400e-003	1.6400e-003		1.6400e-003	1.6400e-003	0.0000	5.0922	5.0922	1.5900e-003	0.0000	5.1255
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.2800e-003**	**0.0493**	**0.0423**	**6.0000e-005**		**1.6400e-003**	**1.6400e-003**		**1.6400e-003**	**1.6400e-003**	**0.0000**	**5.0922**	**5.0922**	**1.5900e-003**	**0.0000**	**5.1255**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	2.0000e-005	2.9000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0181	0.0181	0.0000	0.0000	0.0181
Total	**8.0000e-005**	**2.0000e-005**	**2.9000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0181**	**0.0181**	**0.0000**	**0.0000**	**0.0181**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0107	0.1120	0.1077	1.7000e-004		6.0700e-003	6.0700e-003		5.5900e-003	5.5900e-003	0.0000	15.0296	15.0296	4.7600e-003	0.0000	15.1295
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0107**	**0.1120**	**0.1077**	**1.7000e-004**		**6.0700e-003**	**6.0700e-003**		**5.5900e-003**	**5.5900e-003**	**0.0000**	**15.0296**	**15.0296**	**4.7600e-003**	**0.0000**	**15.1295**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	6.0000e-005	8.0000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0524	0.0524	0.0000	0.0000	0.0524
Total	**2.4000e-004**	**6.0000e-005**	**8.0000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0524**	**0.0524**	**0.0000**	**0.0000**	**0.0524**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.8400e-003	0.1478	0.1270	1.7000e-004		4.9100e-003	4.9100e-003		4.9100e-003	4.9100e-003	0.0000	15.0296	15.0296	4.7600e-003	0.0000	15.1294
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.8400e-003**	**0.1478**	**0.1270**	**1.7000e-004**		**4.9100e-003**	**4.9100e-003**		**4.9100e-003**	**4.9100e-003**	**0.0000**	**15.0296**	**15.0296**	**4.7600e-003**	**0.0000**	**15.1294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	6.0000e-005	8.0000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0524	0.0524	0.0000	0.0000	0.0524
Total	**2.4000e-004**	**6.0000e-005**	**8.0000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0524**	**0.0524**	**0.0000**	**0.0000**	**0.0524**

SV14, TAC, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	191.00	1000sqft	3.29	191,000.00	0
Parking Lot	127.00	Space	0.00	33,648.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 58

Climate Zone 4 **Operational Year** 2018

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 429.6 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioxide Emission intensity

Land Use - From the Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment -

Off-road Equipment - Construction Schedule and Equipment List

Off-road Equipment - Construction Schedule and Equipment List

Trips and VMT - For TAC, trip distance = 0.5 miles

Grading -

Architectural Coating -

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	18.00	20.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	20.00
tblLandUse	LandUseSquareFeet	50,800.00	33,648.00
tblLandUse	LotAcreage	4.38	3.29
tblLandUse	LotAcreage	1.14	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429.6
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3167	2.5153	2.4608	3.3300e-003	5.9600e-003	0.1487	0.1547	1.6500e-003	0.1398	0.1414	0.0000	288.7360	288.7360	0.0673	0.0000	290.1497
2020	1.0238	0.2065	0.2226	3.4000e-004	2.3000e-004	0.0113	0.0115	6.0000e-005	0.0105	0.0106	0.0000	29.5090	29.5090	8.2200e-003	0.0000	29.6816
Total	**1.3405**	**2.7218**	**2.6833**	**3.6700e-003**	**6.1900e-003**	**0.1600**	**0.1662**	**1.7100e-003**	**0.1503**	**0.1520**	**0.0000**	**318.2450**	**318.2450**	**0.0755**	**0.0000**	**319.8312**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2029	2.8144	2.5815	3.3300e-003	5.9600e-003	0.1048	0.1108	1.6500e-003	0.1048	0.1064	0.0000	288.7357	288.7357	0.0673	0.0000	290.1493
2020	1.0163	0.2831	0.2509	3.4000e-004	2.3000e-004	9.7400e-003	9.9700e-003	6.0000e-005	9.7200e-003	9.7900e-003	0.0000	29.5090	29.5090	8.2200e-003	0.0000	29.6815
Total	**1.2192**	**3.0975**	**2.8324**	**3.6700e-003**	**6.1900e-003**	**0.1146**	**0.1208**	**1.7100e-003**	**0.1145**	**0.1162**	**0.0000**	**318.2447**	**318.2447**	**0.0755**	**0.0000**	**319.8308**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**9.05**	**-13.80**	**-5.56**	**0.00**	**0.00**	**28.39**	**27.33**	**0.00**	**23.82**	**23.55**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/22/2019	2/18/2019	5	20	
2	Building Construction	Building Construction	2/19/2019	1/6/2020	5	230	
3	Architectural Coating	Architectural Coating	1/7/2020	2/3/2020	5	20	
4	Paving	Paving	2/4/2020	3/2/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 288,014; Non-Residential Outdoor: 96,005 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	162	0.38
Grading	Graders	0	0.00	174	0.41
Grading	Rubber Tired Dozers	0	0.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	62	0.31
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	2	5.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

Building Construction	9	94.00	37.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	19.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.0000e-003	0.0509	0.0565	8.0000e-005		2.8900e-003	2.8900e-003		2.6600e-003	2.6600e-003	0.0000	7.5442	7.5442	2.3900e-003	0.0000	7.5943
Total	**5.0000e-003**	**0.0509**	**0.0565**	**8.0000e-005**	**0.0000**	**2.8900e-003**	**2.8900e-003**	**0.0000**	**2.6600e-003**	**2.6600e-003**	**0.0000**	**7.5442**	**7.5442**	**2.3900e-003**	**0.0000**	**7.5943**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	3.0000e-005	3.6000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0233	0.0233	0.0000	0.0000	0.0233
Total	**1.1000e-004**	**3.0000e-005**	**3.6000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0233**	**0.0233**	**0.0000**	**0.0000**	**0.0233**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5200e-003	0.0753	0.0636	8.0000e-005		2.6100e-003	2.6100e-003		2.6100e-003	2.6100e-003	0.0000	7.5442	7.5442	2.3900e-003	0.0000	7.5943
Total	**3.5200e-003**	**0.0753**	**0.0636**	**8.0000e-005**	**0.0000**	**2.6100e-003**	**2.6100e-003**	**0.0000**	**2.6100e-003**	**2.6100e-003**	**0.0000**	**7.5442**	**7.5442**	**2.3900e-003**	**0.0000**	**7.5943**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	3.0000e-005	3.6000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0233	0.0233	0.0000	0.0000	0.0233
Total	**1.1000e-004**	**3.0000e-005**	**3.6000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0233**	**0.0233**	**0.0000**	**0.0000**	**0.0233**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2657	2.3691	1.9346	3.0300e-003		0.1452	0.1452		0.1365	0.1365	0.0000	264.5587	264.5587	0.0644	0.0000	265.9105
Total	**0.2657**	**2.3691**	**1.9346**	**3.0300e-003**		**0.1452**	**0.1452**		**0.1365**	**0.1365**	**0.0000**	**264.5587**	**264.5587**	**0.0644**	**0.0000**	**265.9105**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0233	0.0898	0.3937	1.4000e-004	1.9400e-003	5.0000e-004	2.4500e-003	5.7000e-004	4.6000e-004	1.0300e-003	0.0000	11.6673	11.6673	1.8000e-004	0.0000	11.6710
Worker	0.0225	5.5300e-003	0.0756	7.0000e-005	4.0000e-003	1.1000e-004	4.1200e-003	1.0800e-003	1.1000e-004	1.1800e-003	0.0000	4.9426	4.9426	3.8000e-004	0.0000	4.9505
Total	**0.0459**	**0.0953**	**0.4693**	**2.1000e-004**	**5.9400e-003**	**6.1000e-004**	**6.5700e-003**	**1.6500e-003**	**5.7000e-004**	**2.2100e-003**	**0.0000**	**16.6098**	**16.6098**	**5.6000e-004**	**0.0000**	**16.6215**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1534	2.6437	2.0482	3.0300e-003		0.1016	0.1016		0.1016	0.1016	0.0000	264.5584	264.5584	0.0644	0.0000	265.9102
Total	**0.1534**	**2.6437**	**2.0482**	**3.0300e-003**		**0.1016**	**0.1016**		**0.1016**	**0.1016**	**0.0000**	**264.5584**	**264.5584**	**0.0644**	**0.0000**	**265.9102**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0233	0.0898	0.3937	1.4000e-004	1.9400e-003	5.0000e-004	2.4500e-003	5.7000e-004	4.6000e-004	1.0300e-003	0.0000	11.6673	11.6673	1.8000e-004	0.0000	11.6710
Worker	0.0225	5.5300e-003	0.0756	7.0000e-005	4.0000e-003	1.1000e-004	4.1200e-003	1.0800e-003	1.1000e-004	1.1800e-003	0.0000	4.9426	4.9426	3.8000e-004	0.0000	4.9505
Total	**0.0459**	**0.0953**	**0.4693**	**2.1000e-004**	**5.9400e-003**	**6.1000e-004**	**6.5700e-003**	**1.6500e-003**	**5.7000e-004**	**2.2100e-003**	**0.0000**	**16.6098**	**16.6098**	**5.6000e-004**	**0.0000**	**16.6215**

3.3 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.2200e-003	0.0382	0.0336	5.0000e-005		2.2300e-003	2.2300e-003		2.0900e-003	2.0900e-003	0.0000	4.6130	4.6130	1.1200e-003	0.0000	4.6366
Total	**4.2200e-003**	**0.0382**	**0.0336**	**5.0000e-005**		**2.2300e-003**	**2.2300e-003**		**2.0900e-003**	**2.0900e-003**	**0.0000**	**4.6130**	**4.6130**	**1.1200e-003**	**0.0000**	**4.6366**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-004	1.4500e-003	6.7900e-003	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2019	0.2019	0.0000	0.0000	0.2020
Worker	3.8000e-004	9.0000e-005	1.2200e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0840	0.0840	1.0000e-005	0.0000	0.0841
Total	**7.7000e-004**	**1.5400e-003**	**8.0100e-003**	**0.0000**	**1.0000e-004**	**1.0000e-005**	**1.1000e-004**	**3.0000e-005**	**1.0000e-005**	**4.0000e-005**	**0.0000**	**0.2859**	**0.2859**	**1.0000e-005**	**0.0000**	**0.2861**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6300e-003	0.0467	0.0362	5.0000e-005		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003	0.0000	4.6130	4.6130	1.1200e-003	0.0000	4.6366
Total	**2.6300e-003**	**0.0467**	**0.0362**	**5.0000e-005**		**1.7700e-003**	**1.7700e-003**		**1.7700e-003**	**1.7700e-003**	**0.0000**	**4.6130**	**4.6130**	**1.1200e-003**	**0.0000**	**4.6366**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-004	1.4500e-003	6.7900e-003	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2019	0.2019	0.0000	0.0000	0.2020
Worker	3.8000e-004	9.0000e-005	1.2200e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0840	0.0840	1.0000e-005	0.0000	0.0841
Total	**7.7000e-004**	**1.5400e-003**	**8.0100e-003**	**0.0000**	**1.0000e-004**	**1.0000e-005**	**1.1000e-004**	**3.0000e-005**	**1.0000e-005**	**4.0000e-005**	**0.0000**	**0.2859**	**0.2859**	**1.0000e-005**	**0.0000**	**0.2861**

3.4 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0012					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6200e-003	0.0288	0.0352	6.0000e-005		1.6200e-003	1.6200e-003		1.6100e-003	1.6100e-003	0.0000	4.8562	4.8562	7.3000e-004	0.0000	4.8716
Total	**1.0048**	**0.0288**	**0.0352**	**6.0000e-005**		**1.6200e-003**	**1.6200e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**4.8562**	**4.8562**	**7.3000e-004**	**0.0000**	**4.8716**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	9.0000e-005	1.2400e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0849	0.0849	1.0000e-005	0.0000	0.0850
Total	**3.8000e-004**	**9.0000e-005**	**1.2400e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0849**	**0.0849**	**1.0000e-005**	**0.0000**	**0.0850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0012					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9100e-003	0.0377	0.0352	6.0000e-005		1.4100e-003	1.4100e-003		1.4000e-003	1.4000e-003	0.0000	4.8562	4.8562	7.3000e-004	0.0000	4.8716
Total	**1.0031**	**0.0377**	**0.0352**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.4000e-003**	**1.4000e-003**	**0.0000**	**4.8562**	**4.8562**	**7.3000e-004**	**0.0000**	**4.8716**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	9.0000e-005	1.2400e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0849	0.0849	1.0000e-005	0.0000	0.0850
Total	**3.8000e-004**	**9.0000e-005**	**1.2400e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0849**	**0.0849**	**1.0000e-005**	**0.0000**	**0.0850**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0133	0.1378	0.1435	2.2000e-004		7.3900e-003	7.3900e-003		6.8000e-003	6.8000e-003	0.0000	19.6021	19.6021	6.3400e-003	0.0000	19.7352
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0133**	**0.1378**	**0.1435**	**2.2000e-004**		**7.3900e-003**	**7.3900e-003**		**6.8000e-003**	**6.8000e-003**	**0.0000**	**19.6021**	**19.6021**	**6.3400e-003**	**0.0000**	**19.7352**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	7.0000e-005	9.8000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0670	0.0670	0.0000	0.0000	0.0671
Total	**3.0000e-004**	**7.0000e-005**	**9.8000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0670**	**0.0670**	**0.0000**	**0.0000**	**0.0671**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1200e-003	0.1970	0.1693	2.2000e-004		6.5400e-003	6.5400e-003		6.5400e-003	6.5400e-003	0.0000	19.6020	19.6020	6.3400e-003	0.0000	19.7352
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.1200e-003**	**0.1970**	**0.1693**	**2.2000e-004**		**6.5400e-003**	**6.5400e-003**		**6.5400e-003**	**6.5400e-003**	**0.0000**	**19.6020**	**19.6020**	**6.3400e-003**	**0.0000**	**19.7352**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	7.0000e-005	9.8000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0670	0.0670	0.0000	0.0000	0.0671
Total	**3.0000e-004**	**7.0000e-005**	**9.8000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0670**	**0.0670**	**0.0000**	**0.0000**	**0.0671**

Equinix Xilinx, Site Work, TAC

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	573.00	1000sqft	18.00	573,000.00	0
Parking Lot	299.00	Space	0.00	79,220.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	429	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Revised Carbon Dioxide Emission Intensity Standard

Land Use - From Site Plans

Construction Phase - Site Specific Construction Schedule

Off-road Equipment -

Off-road Equipment -

Trips and VMT - For TAC, trip distance=0.5mile

Construction Off-road Equipment Mitigation - Best Management Practices

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblLandUse	LandUseSquareFeet	119,600.00	79,220.00
tblLandUse	LotAcreage	13.15	18.00
tblLandUse	LotAcreage	2.69	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	429
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.1236	1.3957	0.9464	1.1200e-003	0.2206	0.0685	0.2890	0.1036	0.0630	0.1666	0.0000	105.9353	105.9353	0.0319	0.0000	106.6055
Total	**0.1236**	**1.3957**	**0.9464**	**1.1200e-003**	**0.2206**	**0.0685**	**0.2890**	**0.1036**	**0.0630**	**0.1666**	**0.0000**	**105.9353**	**105.9353**	**0.0319**	**0.0000**	**106.6055**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0356	0.9366	0.6899	1.1200e-003	0.0993	0.0255	0.1248	0.0234	0.0255	0.0488	0.0000	105.9352	105.9352	0.0319	0.0000	106.6053
Total	**0.0356**	**0.9366**	**0.6899**	**1.1200e-003**	**0.0993**	**0.0255**	**0.1248**	**0.0234**	**0.0255**	**0.0488**	**0.0000**	**105.9352**	**105.9352**	**0.0319**	**0.0000**	**106.6053**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**71.22**	**32.89**	**27.10**	**0.00**	**54.96**	**62.78**	**56.82**	**77.47**	**59.54**	**70.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	11/1/2016	11/14/2016	5	10	
2	Grading	Grading	11/15/2016	12/26/2016	5	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	162	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0254	0.2732	0.2055	2.0000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	18.4386	18.4386	5.5600e-003	0.0000	18.5554
Total	**0.0254**	**0.2732**	**0.2055**	**2.0000e-004**	**0.0903**	**0.0147**	**0.1050**	**0.0497**	**0.0135**	**0.0632**	**0.0000**	**18.4386**	**18.4386**	**5.5600e-003**	**0.0000**	**18.5554**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	7.0000e-005	8.7000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0469	0.0469	0.0000	0.0000	0.0470
Total	**2.4000e-004**	**7.0000e-005**	**8.7000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0469**	**0.0469**	**0.0000**	**0.0000**	**0.0470**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1500e-003	0.1721	0.1170	2.0000e-004		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	18.4385	18.4385	5.5600e-003	0.0000	18.5553
Total	**6.1500e-003**	**0.1721**	**0.1170**	**2.0000e-004**	**0.0407**	**4.8100e-003**	**0.0455**	**0.0112**	**4.8100e-003**	**0.0160**	**0.0000**	**18.4385**	**18.4385**	**5.5600e-003**	**0.0000**	**18.5553**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	7.0000e-005	8.7000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0469	0.0469	0.0000	0.0000	0.0470
Total	**2.4000e-004**	**7.0000e-005**	**8.7000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0469**	**0.0469**	**0.0000**	**0.0000**	**0.0470**

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0972	1.1222	0.7371	9.3000e-004		0.0538	0.0538		0.0495	0.0495	0.0000	87.2936	87.2936	0.0263	0.0000	87.8465
Total	**0.0972**	**1.1222**	**0.7371**	**9.3000e-004**	**0.1301**	**0.0538**	**0.1839**	**0.0540**	**0.0495**	**0.1034**	**0.0000**	**87.2936**	**87.2936**	**0.0263**	**0.0000**	**87.8465**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-004	2.2000e-004	2.9000e-003	0.0000	1.1000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1563	0.1563	1.0000e-005	0.0000	0.1566
Total	**8.0000e-004**	**2.2000e-004**	**2.9000e-003**	**0.0000**	**1.1000e-004**	**0.0000**	**1.2000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1563**	**0.1563**	**1.0000e-005**	**0.0000**	**0.1566**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0586	0.0000	0.0586	0.0121	0.0000	0.0121	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0284	0.7642	0.5692	9.3000e-004		0.0207	0.0207		0.0207	0.0207	0.0000	87.2935	87.2935	0.0263	0.0000	87.8464
Total	**0.0284**	**0.7642**	**0.5692**	**9.3000e-004**	**0.0586**	**0.0207**	**0.0792**	**0.0121**	**0.0207**	**0.0328**	**0.0000**	**87.2935**	**87.2935**	**0.0263**	**0.0000**	**87.8464**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-004	2.2000e-004	2.9000e-003	0.0000	1.1000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1563	0.1563	1.0000e-005	0.0000	0.1566
Total	**8.0000e-004**	**2.2000e-004**	**2.9000e-003**	**0.0000**	**1.1000e-004**	**0.0000**	**1.2000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1563**	**0.1563**	**1.0000e-005**	**0.0000**	**0.1566**

Attachment 5: Data Center Emergency Generators Health Impacts and Modeling Information

Xilnix Data Center - SV-12, SV-13, and SV-14 Emergency Generators
Source Parameters for Emergency Diesel-Fueled Generators

Source	Load	Stack height (ft)	Stack Diam (in)	Temp (F)	Volume Flow (acfm)	Velocity (ft/min)	Velocity (ft/sec)
Generators 1 - 21	100%	19.33	20	830	23,365	10710	178.5
Generators 1 - 21	25%	19.33	20	630	10,028	4597	76.6

Source	Load	Stack height (m)	Stack Diam (m)	Temp (K)	Velocity (m/sec)
Generators 1 - 21	100%	5.89	0.508	716.5	54.41
Generators 1 - 21	25%	5.89	0.508	605.4	23.35

Xilinx Data Center, San Jose, CA - DPM Cancer Risks From 21 Emergency Generators
50 Hours Operation per Year per Unit at Full Load
Maximum DPM Cancer Risk at Off-Site Receptors
1.5 Meter Receptor Heights

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group

ED = Exposure duration (years)

AT = Averaging time for lifetime cancer risk (years)

FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor

EF = Exposure frequency (days/year)

10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

MEI Cancer Risk From Emergency Generator Operation
1.5 meter receptor height

Exposure Duration (years)	Age	Age Sensitivity Factor	DPM Annual Conc (ug/m3)	DPM Cancer Risk (per million)
0.25	-0.25 - 0*	10	0.0022	0.03
2	1 - 2	10	0.0022	0.71
14	3 - 16	3	0.0022	0.78
14	17 - 30	1	0.0022	0.09
Total Increased Cancer Risk				**1.6**

* Third trimester of pregnancy

Bay Area Air Quality Management District

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD. This form is to be used with the BAAQMD's Google Earth stationary source screening tables.

For guidance on conducting a risk & hazard screening, including for roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.

Table A: Requestor Contact Information	
Contact Name:	Tanushree Ganguly
Affiliation:	Illingworth & Rodkin, Inc.
Phone:	707-794-0400
Email:	tganguly@illingworthrodkin.com
Date of Request	6/8/2016
Project Name:	Equinix
Address:	Great Oaks Boulevard
City:	San Jose
County:	Santa Clara
Type (residential, commercial, mixed use, industrial, etc.):	Industrial: Data Center Building
Project size (# of units, or building square feet):	573 ksf
Comments:	

For Air District assistance, the following steps must be completed:

Complete all the contact and project information requested in Table A. Incomplete forms will not be processed. Please include a project site map.

Download and install the free program Google Earth, http://www.google.com/earth/download/ge/, and then download the county specific Google Earth stationary source application files from the District's website, http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's Information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.

Find the project site in Google Earth by inputting the site's address in the Google Earth search box.

Using the Google Earth ruler function, measure the distance in feet between the project's fenceline and the stationary source's fenceline for all the sources that are within 1,000 feet of the project's fenceline. Verify that the location of the source on the map matches with the source's address in the Information Table, by using the Google Earth address search box to confirm that the source is within 1,000 feet of the project. Please report any mapping errors to the District (District contact information in Step 9).

If the stationary source is within 1,000 feet of the project's fenceline and the stationary source's information table does not list the cancer risk, hazard index, and PM2.5 concentration, and instead says to "Contact District Staff", list the stationary source information in Table B Section 1 below.

Note that a small percentage of the stationary sources have Health Risk Screening Assessment (HRSA) data INSTEAD of screening level data. These sources will be noted by an asterisk next to the Plant Name (Map B on right). If HRSA values are presented, these values have already been modeled and cannot be adjusted further.

Email this completed form to District staff (Step 9). District staff will provide the most recent risk, hazard, and PM2.5 data that are available for the source(s). If this information or data are not available, source emissions data will be provided. Staff will respond to inquiries within three weeks.

Note that a public records request received for the same stationary source information will cancel the processing of your SSIF request.

Submit forms, maps, and questions to Alison Kirk at 415-749-5169, or akirk@baaqmd.gov .

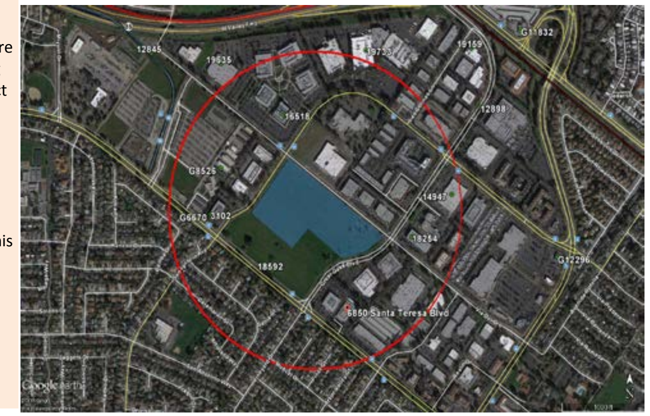


Table B: Stationary Sources within 1,000 feet of Receptor that say "Contact District Staff"

Table B Section 1: Requestor fills out these columns based on Google Earth data				Table B Section 2: BAAQMD returns form with additional information in these columns as needed										
Distance from Receptor (feet)	Plant # or Gas Dispensary #	Facility Name	Street Address	2011 Screening Level Cancer Risk (1)	2011 Screening Level Hazard Index (1)	2011 Screening Level PM2.5 (1)	2014 Screening Level Cancer Risk (1)	2014 Screening Level Hazard Index (1)	2014 Screening Level PM2.5 (1)	Distance to Threshold Cancer Risk	Multiplier	Distance Adjusted PM2.5 Level		adjusted cancer
	16518	Northrop Grumman Systems Corp	6379 San Ignacio Avenue	5.61	0.0086	0.0058	58.4	0.03	0.08	ap 10991, JHL, 10/26/04			generator this source has HrSA values, consider using HRSA	5.61
							5.61							
	18592	Berg and Berg	6850 Santa Teresa Blvd	93.53	0.033	0.022	2.4	0.001	0.003				generator, new plant no. 22169	
						adjusted for distance:	0.38	<0.001	<0.001					
	18254	ISCS, Inc.	100 Great oaks Blvd.	0.0051	2.00E-05	5.30E-06	1.38	0.002	0.002				generator	
	14947	VA Venture	80 great Oaks Blvd.	27.28	0.01	0.006	n/a			generator, current emissions data attached				
							1.4	0	0	used beta RH Screening tool				
	19733	Stion Corporation	6321 San Ignacio Avenue	Data Unavailable	Data Unavailable	Data Unavailable	0	0.0009	0	facility wide wipe cleaning				

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara	
Roadway Direction	East-West	
Side of the Roadway	South	
Distance from Roadway	35	feet
Annual Average Daily Traffic (ADT)	16,950	

Results

Santa Clara County

EAST-WEST DIRECTIONAL ROADWAY

PM2.5 annual average

0.236 (µg/m^3)

Cancer Risk

9.30 (per million)

Santa Theresa Blvd

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

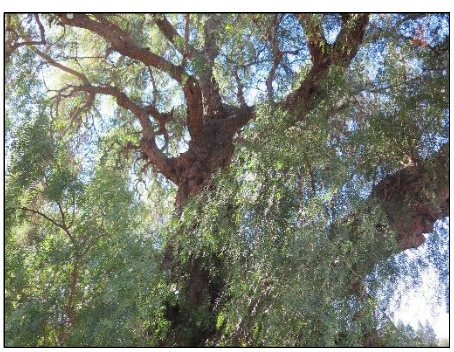
6.39

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.



H. T. HARVEY & ASSOCIATES
Ecological Consultants

Equinix Data Center Project
Tree Survey Report

Project # 3804-01

Prepared for:

John Schwarz
David J. Powers & Associates
1871 The Alameda, Suite 200
San Jose, CA 95126

Prepared by:

H. T. Harvey & Associates

November 17, 2015

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Tables

Figures

List of Contributors

Stephen C. Rottenborn, Ph.D., Senior Wildlife Ecologist, Principal
Patrick Boursier, Ph.D., Senior Plant Ecologist
Ginger Bolen, Ph.D., Senior Wildlife Ecologist, Project Manager
Maya Goklany, M.S., Plant Ecologist

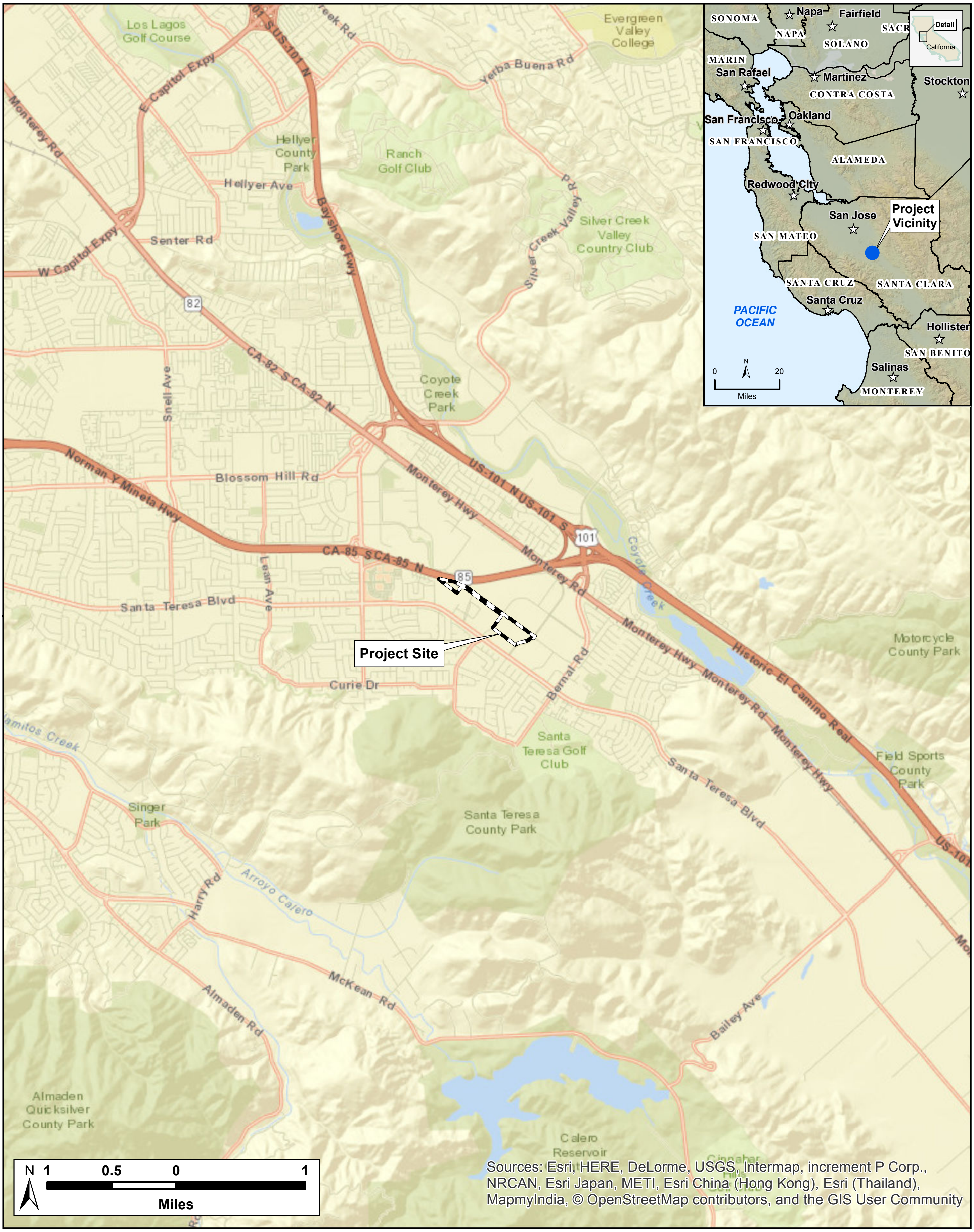
Section 1.0 Introduction

H. T. Harvey & Associates conducted a tree survey for the Equinix Data Center Project. The project entails the construction of the Equinix Data Center, the Santa Teresa Pacific Gas and Electric (PG&E) Substation, and a new PG&E distribution route, which will connect the new substation to the Equinix Data Center.

1.1 General Project Area Description

The 31.27-acre (ac) project site is located in the City of San Jose (City) in Santa Clara County, California. It is located in the *Santa Teresa Hills*, *California* U.S. Geological Survey (USGS) 7.5-minute quadrangle (Figure 1). The Project region experiences a Mediterranean climate, characterized by dry, hot summers and wet, mild winters with the majority of annual precipitation falling between the months of October and April.

The project is embedded in an urban matrix in the Edenvale area of the City and is surrounded by commercial development, residential neighborhoods, and roadways. The Equinix Data Center portion of the project, which will consist of three data center buildings, each approximately 180,000 square feet (sq ft) in size, is proposed to be constructed on a vacant lot bound by Via Del Oro, San Ignacio Avenue, Santa Teresa Boulevard, and Great Oaks Boulevard. The Santa Teresa Substation portion of the project is located immediately south of California State Route 85 (SR 85) within the existing PG&E Edenvale Service Center, approximately 2,200 feet (ft) to the northwest of the proposed Equinix Data Center. The new PG&E distribution route, which will originate from the new PG&E substation, will pass under the Santa Clara Valley Transportation Authority (VTA) light rail tracks and run down the center of Via Del Oro for approximately 0.35 mile (mi).



N:\Projects3800\3804-01\Reports\Tree Survey Report\Fig 1 Vicinity Map.mxd

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Figure 1. Vicinity Map
Equinix Data Center and Santa Teresa Substation Project
Tree Survey Report (3804-01)
November 2015

Section 2.0 Methodology

H. T. Harvey & Associates plant ecologist Maya Goklany, M.S., conducted the tree survey on October 30, 2015 and November 4, 2015 in the 31.27-ac project site. Prior to conducting fieldwork, H. T. Harvey & Associates ecologists reviewed project plans and the project description provided by David J. Powers & Associates, and conducted an impact assessment to determine areas of the site that would be temporarily and permanently impacted by the proposed activities (Figure 2).

In areas of the project site that would be permanently impacted (23.74 ac), all trees with diameter-at-breast-height (DBH) measurements of 2 inches or larger were mapped using a sub-meter Global Positioning System (Trimble GeoXT™ GPS unit). "Breast-height" is assumed to be 4.5 ft above the ground surface under the City's Municipal Code. Each tree was identified to species using *The Jepson Manual, Vascular Plants of California, Second Edition* (Baldwin et al. 2012) and tagged with a unique identification number, either with new or existing aluminum labels on the tree trunks. Methodologies described in the *Guidelines for Developing and Evaluating Tree Surveys* (Bernhardt & Swiecki 1991) were utilized to measure DBH with a 28-inch Biltmore stick to the nearest 1-inch. While standing squarely in front of each tree, the Biltmore stick was held in a horizontal position 25-inches from the observer's eye. Measurements of DBH were recorded on the upslope side of the tree trunk; however, there were a number of circumstances in which complications arose with measuring DBH in this straightforward manner. Common complications included (1) leaning trees, (2) trees forking below or near DBH, and (3) multi-stemmed trees. For each of these situations, standard procedures as outlined in Bernhardt & Swiecki (1991) were followed. For multi-stemmed trees, the total DBH was determined by squaring the DBH of each stem, summing those values, and taking the square root of the sum to arrive at a single additive value. Trees were considered multi-stemmed when a fork in the main stem was observed aboveground, but below breast height.

Tree health was also scored for each tree rooted in areas that would be permanently impacted by project activities. Health was scored by visual inspection using a four-tiered scoring system:

1. Trees with *excellent* health, as indicated from evidence of substantial annual canopy growth and a lack of thinning of the canopy, branch or twig dieback, epicormic growth[1], and other signs of disease.

2. Trees with *good* health, as indicated from evidence of a small to moderate amount of annual canopy growth and a lack of epicormic growth and other signs of disease. Some trees with a small amount of canopy or dieback of branches and twigs were placed in this tier, but not individuals that displayed both of these qualities.

[1] Epicormic sprouts are known as "suckers" and emerge from dormant buds beneath the bark of a tree. Under normal, "healthy" conditions their growth is suppressed by hormones from active shoots located higher up in the tree canopy. Under stressful conditions, epicormic sprouts develop in response to increased light levels or other stressful conditions or events (such as storm damage, fire, or improper pruning) that decrease the total leaf surface of the tree.

N:\Projects3800\3804-01\Reports\Tree Survey Report\Fig 2 Tree Survey Results with Tags.mxd

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Ecological Consultants

Figure 2. Tree Survey Results
Equinix Data Center and Santa Teresa Substation Project
Tree Survey Report (3804-01)
September 2016

3. Trees with *fair* health, as indicated from evidence of little to no annual canopy growth and a lack of epicormic growth and other signs of disease. Trees in this tier exhibited a *small* amount of canopy thinning *and* dieback of branches and twigs, but did not include individuals that displayed just one of these qualities.

4. Trees with *poor* health, as indicated from evidence of little to no annual canopy growth and little to no epicormic growth and other signs of disease. Trees in this tier exhibited a *moderate* amount of canopy thinning *and* dieback of branches and twigs.

Per the request of the project proponent, in areas of the project site that would be temporarily impacted (i.e., trees lining Via Del Oro along the new PG&E distribution route and the area north of the proposed substation), tree species and the number of individuals rooted within the boundaries of the site were documented; however, DBH and tree health were not recorded and these trees were not tagged.

Section 3.0 Results

A total of 22 trees with a DBH of 2 inches or greater were recorded in the areas of the project site where permanent impacts are proposed (Figure 2). Twelve trees had a DBH greater than or equal to 18 inches, and meet the size criteria of ordinance-sized trees under the City's Municipal Code. Figure 2 shows the location and species of each individual tree documented in the permanent impacts areas of the project site, and indicates which trees are ordinance-sized.

Trees in the permanent impact area occurred within ruderal grassland. This area had been mowed during the weeks prior to the October 30, 2015 site visit (Photo 1, Appendix A); however, the plant community appeared to have been dominated by non-native grasses, primarily wild oats (*Avena* sp.), and non-native forbs such as stinkwort (*Dittrichia graveolens*), mustard (*Brassica* sp.) and horehound (*Marrubium vulgare*). In addition, several scattered cotoneaster (*Cotoneaster* sp.) shrubs were observed. Trees in the permanent impact area of the project site were scattered and did not form a dense overstory. Species that are native to the Santa Clara Valley include valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), and blue elderberry (*Sambucus nigra* ssp. *caerulea*). Tree species that are native to California, but do not occur naturally in the Santa Clara Valley, include coast redwood (*Sequoia sempervirens*) and Northern California black walnut (*Juglans hindsii*). One non-native tree, Peruvian pepper tree (*Schinus mollis*), was also recorded on the site. Table 1 on the following page summarizes all the trees within the permanent impact areas of the project site, and includes their tag number, species, DBH measurement, and health rating.

Coast live oak trees were the most common species documented in the tree survey (nine individuals) (Photo 1, Appendix A). All were in excellent health; they displayed no evidence of physiological stress, exhibited substantial annual vegetative growth, and in addition, many coast live oaks had produced a large annual crop of acorns. One exceptionally large valley oak with a DBH measurement of 66 inches is located near the corner of Great Oaks Boulevard and Via Del Oro (Figure 2). This tree has a large canopy spread and a moderate amount of annual canopy growth, but was considered to be in good health due to the loss of a large limb (Photo 2, Appendix A). Several other exceptionally large Northern California black walnuts and Peruvian pepper trees with DBH measurements ranging from 60 inches to 81 inches,and large, spreading canopies were documented (Table 1; Photos 3-6, Appendix A). Owing to the presence of Peruvian pepper trees amongst these individuals, the largest trees recorded in the tree survey were likely planted, but are potentially more than 150 years old. The Peruvian pepper trees were all in excellent health. In contrast, the Northern California black walnuts received lower health ratings (fair) due to some evidence of both canopy thinning, loss of large limbs, and twig die-off. Smaller, blue elderberry trees were all in fair health; although a small amount of both canopy thinning and twig die-off was recorded, these trees still had produced a substantial annual crop of fruit. One coast redwood tree in the permanent impact area of the project site was rated as having poor health, and exhibited signs of drought stress, such as dead needles and a very sparse canopy.

Table 1. Summary of Tree Survey Results

Tag #	Scientific Name	Common Name	Total DBH (inches)	Ordinance -size	Health and Vigor Rating
130	*Quercus agrifolia*	coast live oak	22	Yes	1
131	*Quercus agrifolia*	coast live oak	23	Yes	1
132	*Quercus agrifolia*	coast live oak	15	No	1
133	*Quercus agrifolia*	coast live oak	32	Yes	1
134	*Quercus agrifolia*	coast live oak	10	No	1
135	*Quercus agrifolia*	coast live oak	8	No	1
138	*Quercus agrifolia*	coast live oak	27	Yes	1
139	*Quercus lobata*	valley oak	66	Yes	2
141	*Quercus agrifolia*	coast live oak	13	No	1
142	*Juglans hindsii*	Northern California black walnut	16	No	3
143	*Sequoia sempervirens*	coast redwood	65	Yes	4
144	*Juglans hindsii*	Northern California black walnut	72	Yes	3
145	*Juglans hindsii*	Northern California black walnut	60	Yes	3
146	*Sambucus nigra* ssp. *caerulea*	blue elderberry	9	No	3
147	*Sambucus nigra* ssp. *caerulea*	blue elderberry	8	No	3
148	*Sambucus nigra* ssp. *caerulea*	blue elderberry	13	No	3
149	*Schinus mollis*	Peruvian pepper tree	74	Yes	1
150	*Schinus mollis*	Peruvian pepper tree	81	Yes	1
151	*Schinus mollis*	Peruvian pepper tree	18	Yes	1
401	*Sambucus nigra* ssp. *caerulea*	blue elderberry	12	No	3
402	*Quercus agrifolia*	coast live oak	10	No	1
403	*Schinus mollis*	Peruvian pepper tree	74	Yes	1

As mentioned above under Section 2.0, tree species and the number of individuals rooted within the boundaries of the site were recorded in areas that would be temporarily impacted by project activities (Figure 2). Temporary impact areas include some ruderal grassland, but are generally composed of developed/landscaped habitat. Developed areas of the site are devoid of vegetation and include hardscape (asphalt and concrete surfaces) along Via Del Oro, the VTA light rail tracks, and a PG&E maintenance and storage yard. In addition, the northernmost portion of the site (to the west of the PG&E Edenvale Center) was graded prior to the November 4, 2015 site visit, and thus, was overlain by bare soil and mapped as developed/landscaped habitat. At the time of the survey, three trees remained in the northernmost parcel: Mexican fan palm (*Washingtonia robusta*), elm (*Ulmus* sp.), and European olive (*Olea europa*). Landscaped areas on the project site are located in the right-of-way of Via Del Oro. These vegetated strips lining the road are composed of irrigated lawn and 59 planted trees, including 44 London plane trees (*Platanus hybrida*), eight shamel ash trees (*Fraxinus uhdei*), two coast redwoods, and five sweet gum trees (*Liquidambar styraciflua*) (Photo 7, Appendix A).

Literature Cited

Baldwin, B., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken. 2012. The Jepson Manual: Vascular Plants of California. 2nd Edition. University of California Press, Berkeley.

Bernhardt, E. and T.J. Swiecki. 1991. Guidelines for developing and evaluating tree ordinances. Prepared for: Urban Forestry Program, California Department of Forestry and Fire Protection, Sacramento, CA.

Appendix A. Photos

Photo 1. Coast live oak tree in ruderal grassland habitat.

Photo 2. Large valley oak at the corner of Great Oaks Boulevard and Via Del Oro.

Photo 3. Large Northern California black walnut.

Photo 4. The base of a large Northern California black walnut with a Biltmore stick for reference.

Photo 5. The base of a large Peruvian pepper tree with a Biltmore stick for reference.

Photo 6. View into the canopy of a large Peruvian pepper tree.

Photo 7. Sweet gum trees along the right-of-way of Via Del Oro in developed/landscaped habitat.

Table 1. Summary of Tree Survey Results
October 2016

Tag #	Scientific Name	Common Name	Total DBH (inches)	Ordinance-size	Health and Vigor Rating	Removal
130	*Quercus agrifolia*	coast live oak	22	Yes	1	Yes
131	*Quercus agrifolia*	coast live oak	23	Yes	1	Yes
132	*Quercus agrifolia*	coast live oak	15	No	1	Yes
133	*Quercus agrifolia*	coast live oak	32	Yes	1	Yes
134	*Quercus agrifolia*	coast live oak	10	No	1	Yes
135	*Quercus agrifolia*	coast live oak	8	No	1	Yes
138	*Quercus agrifolia*	coast live oak	27	Yes	1	Yes
139	*Quercus lobata*	valley oak	66	Yes	2	No
141	*Quercus agrifolia*	coast live oak	13	No	1	Yes
142	*Juglans hindsii*	Northern California black walnut	16	No	3	No
143	*Sequoia sempervirens*	coast redwood	65	Yes	4	No
144	*Juglans hindsii*	Northern California black walnut	72	Yes	3	No
145	*Juglans hindsii*	Northern California black walnut	60	Yes	3	No
146	*Sambucus nigra* ssp. *caerulea*	blue elderberry	9	No	3	No
147	*Sambucus nigra* ssp. *caerulea*	blue elderberry	8	No	3	No
148	*Sambucus nigra* ssp. *caerulea*	blue elderberry	13	No	3	No
149	*Schinus mollis*	Peruvian pepper tree	74	Yes	1	No
150	*Schinus mollis*	Peruvian pepper tree	81	Yes	1	No
151	*Schinus mollis*	Peruvian pepper tree	18	Yes	1	No
401	*Sambucus nigra* ssp. *caerulea*	blue elderberry	12	No	3	Yes
402	*Quercus agrifolia*	coast live oak	10	No	1	Yes
403	*Schinus mollis*	Peruvian pepper tree	74	Yes	1	Yes

November 17, 2015

John Schwarz
David J. Powers & Associates
1871 The Alameda, Suite 200
San Jose, CA 95126

Subject: Equinix Data Center Project Biological Resources Report (HTH # 3804-01)

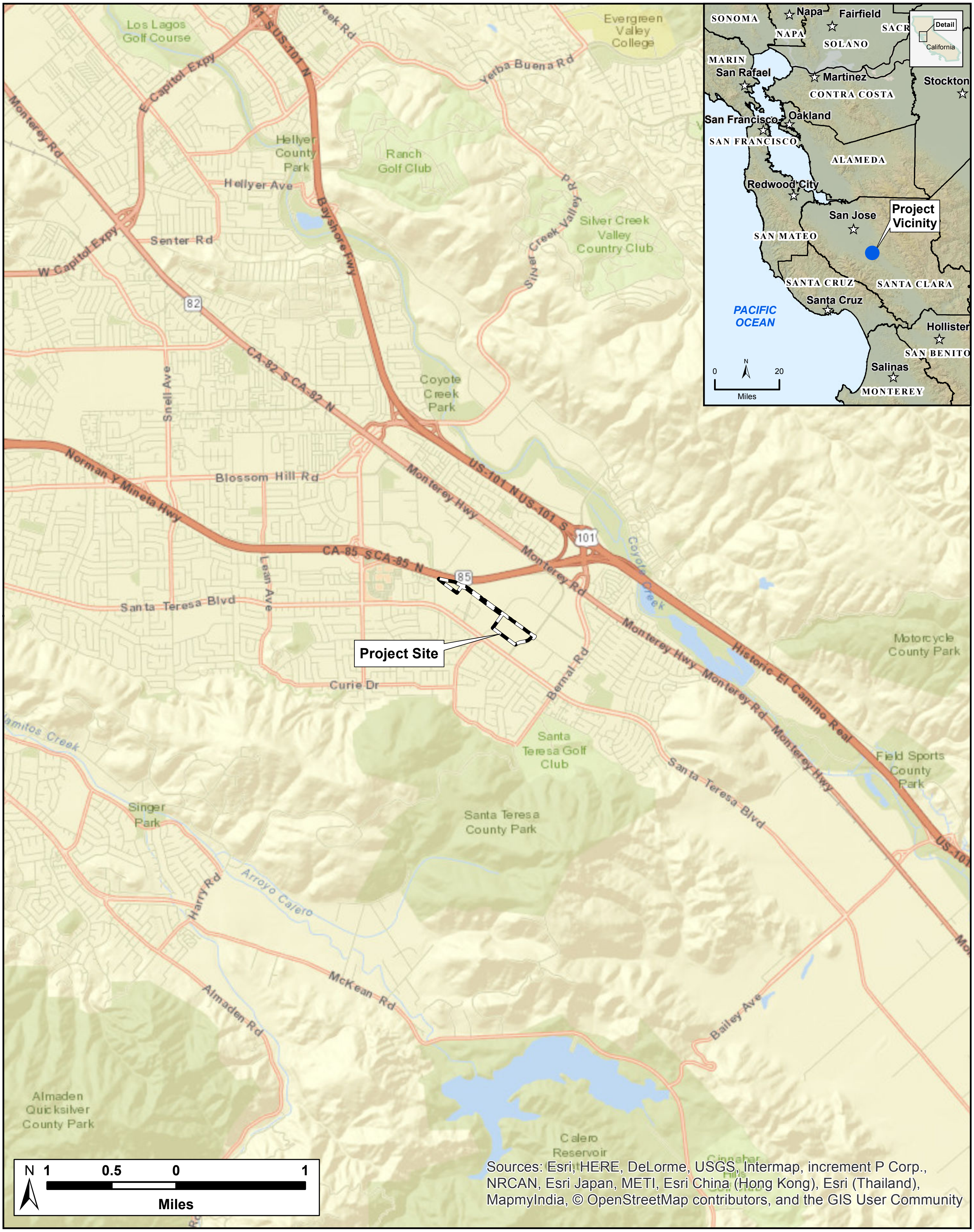
Dear Mr. Schwarz:

Per your request, this biological resources report provides H. T. Harvey & Associates' assessment of the existing biological conditions on the site located at the corner of San Ignacio Avenue and Via Del Oro in the Edenvale area of San Jose, California, and the potential impacts on sensitive biological resources as a result of the proposed construction of the Equinix Data Center and Santa Teresa Substation project. This assessment is based upon the project plans provided to H. T. Harvey & Associates by David J. Powers & Associates in July 2015.

Project Location and Description

The 31.27-acre (ac) project site is located in the City of San Jose in Santa Clara County, California. The project is embedded in an urban matrix in the Edenvale area of the City and is surrounded by commercial development, residential neighborhoods, and roadways. The project entails the construction of the Equinix Data Center, the Santa Teresa Pacific Gas and Electric (PG&E) Substation, and a new PG&E distribution route, which will connect the new substation to the Equinix Data Center. The Equinix Data Center portion of the project, which will consist of three data center buildings, each approximately 180,000 square feet (ft) in size, is proposed to be constructed on a vacant lot bound by Via Del Oro, San Ignacio Avenue, Santa Teresa Boulevard, and Great Oaks Boulevard. The Santa Teresa Substation portion of the project is located immediately south of California State Route 85 (SR 85) within the existing PG&E Edenvale Service Center, approximately 2,200 ft to the northwest of the proposed Equinix Data Center. The new PG&E distribution route, which will originate from the new PG&E substation, will pass under the Santa Clara Valley Transportation Authority (VTA) light rail tracks and run down the center of Via Del Oro for approximately 0.35 mile (mi).

The proposed project is a "covered project" under the approved Santa Clara Valley Habitat Plan (VHP) (ICF International 2012). As a result, the proposed project is required by the City of San Jose to pay VHP fees for



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Ecological Consultants

Figure 1. Vicinity Map
Equinix Data Center and Santa Teresa Substation Project
Biological Resources Report (3804-01)
November 2015

land impacts in accordance with the types and acreage of habitat impacted, and to implement conservation measures specified by VHP conditions. This biological resources report, therefore, incorporates VHP avoidance, minimization, and compensatory mitigation measures as appropriate, in the context of measures that we believe to be appropriate to reduce impacts to less-than-significant levels under the California Environmental Quality Act (CEQA).

Methods

Prior to conducting field work, H. T. Harvey & Associates ecologists reviewed project plans and the project description provided by David J. Powers & Associates, the *Santa Teresa Hills*, *California* U.S. Geological Survey (USGS) 7.5-minute topographic map, aerial photos (Google Inc. 2015), the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB 2015), and VHP information on special-status species and sensitive habitats (ICF International 2012) to assess the potential distribution of special-status plants and animals in the project vicinity. For the purposes of this report, the project vicinity is defined as the area within a 5-mi radius of the project site.

In addition, for plants, we reviewed all species on current California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1A, 1B, 2A, and 2B lists occurring in the *Santa Teresa Hills* USGS quadrangle and the surrounding eight quadrangles (*San Jose West, San Jose East, Lick Observatory, Los Gatos, Morgan Hill, Laurel, Loma Prieta,* and *Mount Madonna*) (CNPS 2015). Quadrangle-level results are not maintained for CRPR 3 and 4 species, so we also conducted a search of the CNPS records for these species occurring in Santa Clara County (CNPS 2015). In addition, we queried the CNDDB (2015) for special-status plant species and natural communities of special concern that occur within the project region.

A reconnaissance-level field survey of the project site was conducted by H. T. Harvey & Associates plant ecologist Maya Goklany, M.S., and wildlife ecologist Craig Fosdick, M.S., on October 30, 2015 and November 4, 2015. The purpose of this survey was to provide a project-specific impact assessment for the development of the site as described above. Specifically, the survey was conducted to (1) assess existing biotic habitats and plant and animal communities on the project site, (2) assess the site for its potential to support special-status species and their habitats, and (3) identify potential jurisdictional habitats (such as waters of the U.S./state), although a formal wetland delineation was not conducted.

A focused survey for burrowing owls (*Athene cunicularia*), a California Species of Special Concern, and their habitat (i.e., burrows of California ground squirrels [*Spermophilus beecheyi*]) was conducted by Mr. Fosdick concurrently with the reconnaissance survey. He walked the entirety of the project site searching for burrows of California ground squirrels, burrowing owls, or evidence of recent owl presence (e.g., the presence of feathers, whitewash, or pellets). In addition, he conducted a focused survey for evidence of previous raptor nesting activity (i.e., large stick nests) in trees, and for potential bat roosting habitat on the site.

In addition, Ms. Goklany conducted a formal tree survey concurrently with the reconnaissance site survey. All trees in the project site with a diameter-at-breast-height (DBH) greater than 2 inches were mapped using a sub-meter Global Positioning System (Trimble GeoXT™ GPS unit). Each tree was identified to species using *The Jepson Manual, Vascular Plants of California, Second Edition* (Baldwin et al. 2012) and tagged with a unique identification number. Methodologies described in the *Guidelines for Developing and Evaluating Tree Surveys* (Bernhardt & Swiecki 1991) were utilized to measure DBH with a Biltmore stick to the nearest inch. A detailed description of the methodologies employed in the tree survey and the survey results are presented in a separate Tree Survey Memorandum (H. T. Harvey & Associates 2015).

Existing Biological Conditions

The Project site is underlain by three non-native soil types: (1) Urbanland-Elpaloalto complex, 0 to 2 percent slopes; (2) Urbanland-Stevens Creek complex, 0 to 2 percent slopes; and (3) Urbanland-Campbell complex, 0 to 2 percent slopes, protected. The Urbanland series includes imported fill, and is found in developed areas over much of the San Francisco Bay region. These soil types include clay, sandy, and silty loams that occur in alluvial fans. They are well-drained, and have the potential to be the Urbanland-Elpaloalto and Urbanland-Campbell complexes are sometimes slightly saline (Natural Resources Conservation Service 2015). The region experiences a Mediterranean climate, characterized by dry, hot summers and wet, mild winters with the majority of annual precipitation falling between the months of October and April.

General Habitat Conditions and Wildlife Use

The reconnaissance-level field survey identified two general biotic habitat types on the project site, ruderal grassland and developed/landscaped. These habitats are described in detail below. Table 1 provides a summary of the habitat acreages on the site, and their distribution within the site is depicted in Figure 2; representative photos of each habitat type are also provided below.

Table 1. Habitat Acreages on the Project Site

Habitat	Area (acres)	Percentage of Site
Ruderal grassland	22.99	74%
Developed/landscaped	8.28	26%
Total	**31.27**	**100**

Ruderal Grassland

Vegetation. The ruderal grasslands occupying the proposed Equinix Data Center portion of the project site were mowed during the weeks prior to the October 30, 2015 site visit (Photo 1); however, the plant community

N:\Projects3800\3804-01\Reports\Biological Resources Report\Fig 2 Habitat and Impact Map.mxd

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Figure 2. Habitat and Impacts Map
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appeared to have been dominated by non-native grasses, primarily wild oats (*Avena* sp.), and non-native forbs such as stinkwort (*Dittrichia graveolens*), mustard (*Brassica* sp.) and horehound (*Marrubium vulgare*). In addition, several scattered cotoneaster (*Cotoneaster* sp.) shrubs and 22 healthy and mature trees were observed scattered throughout the grasslands (Photo 2). Tree species documented on the project site that are native to the Santa Clara Valley include valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), and blue elderberry (*Sambucus nigra* ssp. *caerulea*). Tree species that are native to California, but do not occur naturally in the Santa Clara Valley, include coast redwood (*Sequoia sempervirens*) and Northern California black walnut (*Juglans hindsii*). Non-native trees, such as English walnut (*Juglans regia*) and Peruvian pepper tree (*Schinus mollis*) were also recorded on the site. Twelve trees had a DBH greater than or equal to 18 inches, and of these trees, several were exceptionally large, having DBH measurements ranging from 60 inches to 81 inches and large canopy spreads. Owing to the presence of Peruvian pepper trees amongst these individuals, these large trees were likely planted, but are potentially more than 150 years old. A full description of the results of the tree survey is provided in a separate Tree Survey Memorandum (H. T. Harvey & Associates 2015).

Photo 1. Ruderal grassland habitat on the project site.

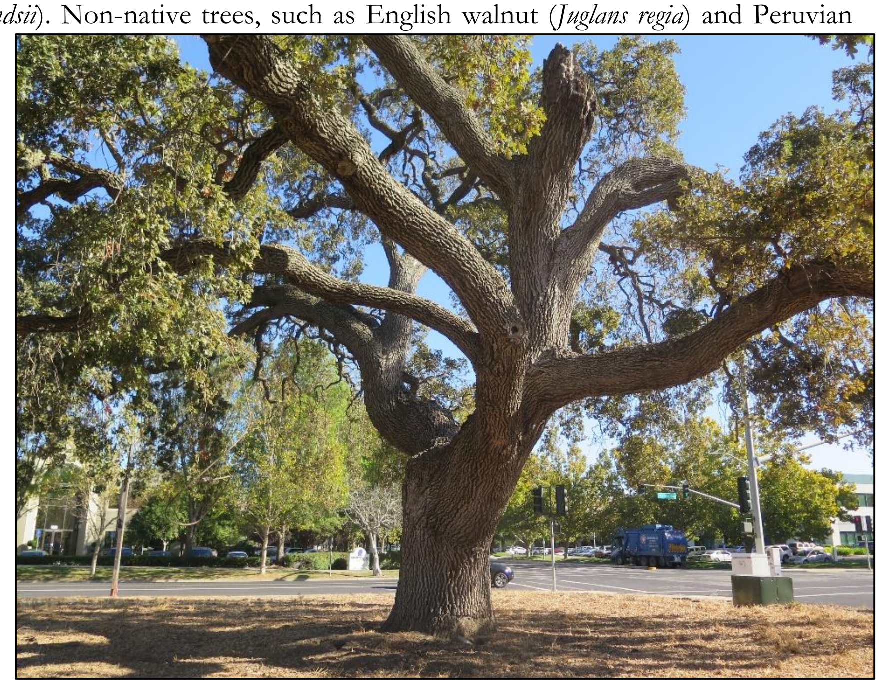

Photo 2. Large valley oak at the corner of Great Oaks Boulevard and Via Del Oro.

The ruderal grasslands occurring within the PG&E Edenvale Center portion of the project site are disturbed by facility operations, and heavy equipment has compacted the soil; however, much of this portion of the site still supports vegetation and is dominated by non-native grasses and forbs such as wild oats and stinkwort. Both wild oats and stinkwort are rated as "moderately" invasive by the California Invasive Plant Council (Cal-IPC), and can have a substantial and apparent ecological impact on physical processes, plant and animal communities, and vegetation structure (Cal-IPC 2015).

Wildlife. The ruderal grasslands on the project site are limited in extent, have relatively simple vegetation structure, and are isolated from more extensive grasslands and other natural areas in the region, and as such provide relatively low-quality habitat for wildlife species typically associated with grasslands. Wildlife species associated with more extensive grassland habitats in the region, such as the grasshopper sparrow (*Ammodramus savannarum*) and loggerhead shrike (*Lanius ludovicianus*), are absent from this small habitat patch. Many of the species that occur on the site are common species that occur in adjacent urban areas and use the site for foraging, such as the American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), cedar waxwing (*Bombycilla cedrorum*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), northern mockingbird (*Mimus polyglottos*), house finch (*Haemorhous mexicanus*), and mourning dove (*Zenaida macroura*), all of which were observed during the site visit. In addition, two relatively common bird species that are not typically associated with urban/developed landscapes, the western meadowlark (*Sturnella neglecta*) and American pipit (*Anthus rubescens*), were also observed in the ruderal grasslands during the site visit. Few birds are likely to nest in these grasslands due to their limited extent and structural simplicity, but species such as the Anna's hummingbird, American crow, and western scrub-jay (*Aphelocoma californica*) may nest in the scattered large trees on the site.

The mature trees scattered throughout the ruderal grasslands support common bird species such as the western scrub-jay, oak titmouse (*Baeolophus inornatus*), and bushtit (*Psaltriparus minimus*). These trees also provide perches for hunting raptors, such as the red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), and American kestrel (*Falco sparverius*). One red-tailed hawk was observed perched on the ground in the ruderal grasslands, apparently foraging, though no nests of tree-nesting raptors were observed on the site. Multiple California ground squirrels and California ground squirrel burrows, most of which appeared to be active, were observed in the ruderal grasslands. However, no burrowing owls or sign of burrowing owl use was observed.

In general, wildlife use of the ruderal grassland habitat is limited by the high levels of human disturbance that occur on the site, and in the urban matrix surrounding it. During the site visit, H. T. Harvey & Associates ecologists observed three different people visit the site to fly radio-controlled quadcopters, and there was evidence of multiple vehicle tracks and of a temporary homeless encampment under one of the Peruvian pepper trees.

Developed/Landscaped

Vegetation. The project site includes 8.28 ac of developed/landscaped habitat. Developed areas of the site are devoid of vegetation and include hardscape (asphalt and concrete surfaces) along Via Del Oro, the VTA light rail tracks, and a PG&E maintenance and storage yard. In addition, the northernmost portion of the site (to the west of the PG&E Edenvale Center) was graded prior to the November 4, 2015 site visit, and thus, was overlain by bare soil and mapped as developed/landscaped habitat. At the time of the survey, three trees remained in the northernmost parcel: Mexican fan palm (*Washingtonia robusta*), elm (*Ulmus* sp.), and European olive (*Olea europa*). Landscaped areas on the project site are located in the right-of-way of Via Del Oro. These vegetated strips lining the road are comprised of irrigated lawn and 59 planted trees, including London plane (*Platanus hybrida*), shamel ash (*Fraxinus uhdei*), coast redwood, and sweet gum (*Liquidambar styraciflua*) (Photo 3).

Wildlife. The developed/landscaped habitat on the project site supports some common animal species, although the diversity is lower than in nearby less disturbed habitats. The species that are found here include the house finch (*Haemorhous mexicanus*), California towhee (*Melozone crissalis*), and white-crowned sparrow (*Zonotrichia leucophrys*), as well as introduced, non-native species such as the rock pigeon (*Columba livia*). One of the two red-tailed hawks observed during the site visit was perched in the top of a coast redwood tree located along Via Del Oro, and a likely red-tailed hawk nest also was observed approximately 80 ft high on a cell tower located in the Oak Grove School District bus yard, adjacent to Via Del Oro but outside the project boundary. Several California ground squirrel burrow clusters were also observed along Via Del Oro, within 10 ft of the edge of the street, and several old, partially collapsed California ground squirrel burrows were observed at the proposed substation site. However, no burrowing owls or sign of burrowing owl use was observed.

Photo 3. Sweet gun trees along the right-of-way of Via Del Oro in developed/landscaped habitat.

Special-status Plant and Animal Species

As described in *Methods* above, information concerning threatened, endangered, or other special-status species that could occur on the project site was collected from several sources and reviewed by H. T. Harvey & Associates ecologists prior to the site visit. The specific habitat requirements and the locations of known occurrences of each special-status species were the principal criteria used for inclusion in the list of species potentially occurring on the site. Figures 3 and 4 are maps of the CNDDB's special-status plant and animal species records in the general vicinity of the project site, defined for the purposes of this report as the area within a 5-mi radius. These generalized maps are valuable on a historic basis, as they show areas where special-

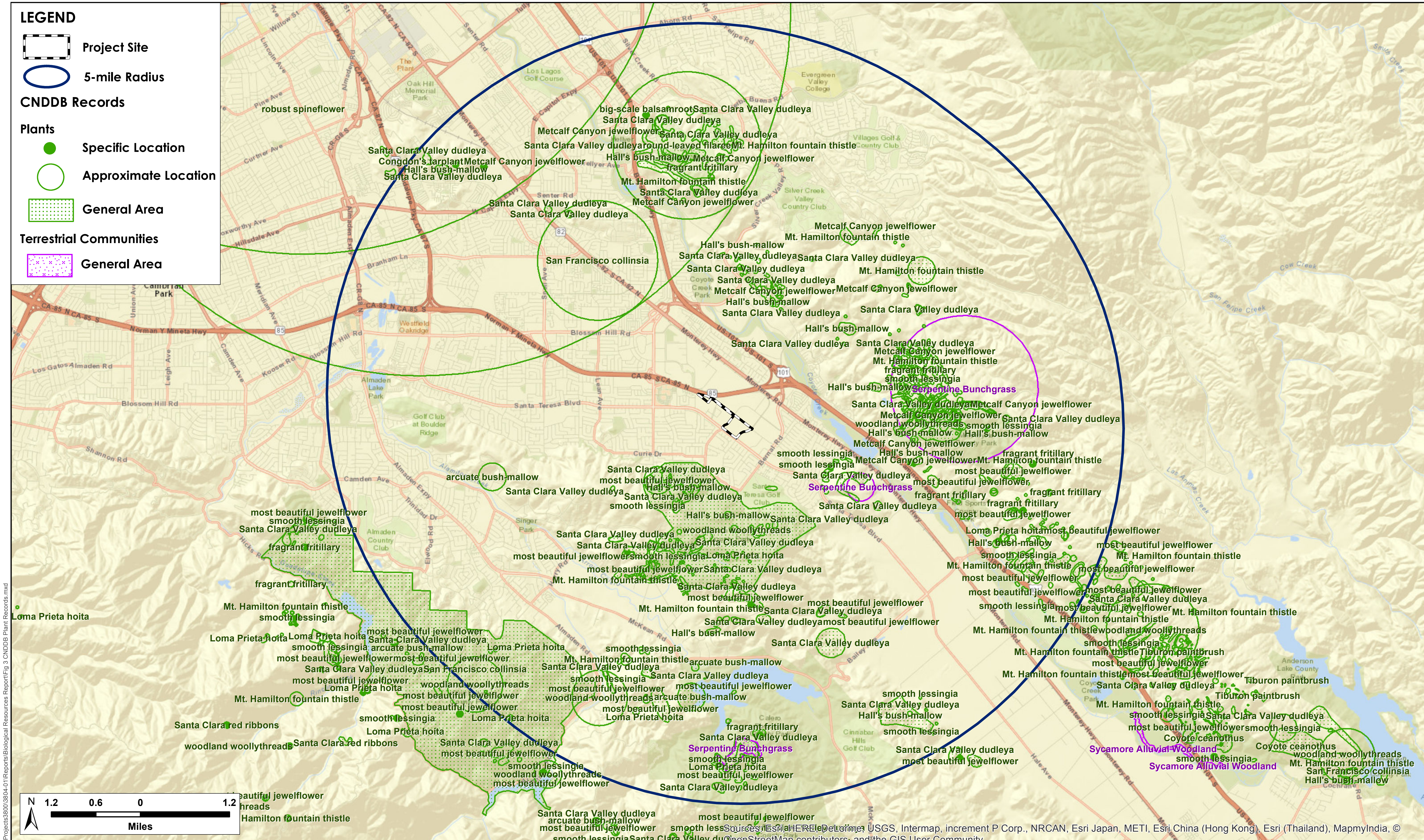

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Figure 3. California Natural Diversity Database Plant Records
Equinix Data Center and Santa Teresa Substation Project
Biological Resources Report (3804-01)
November 2015

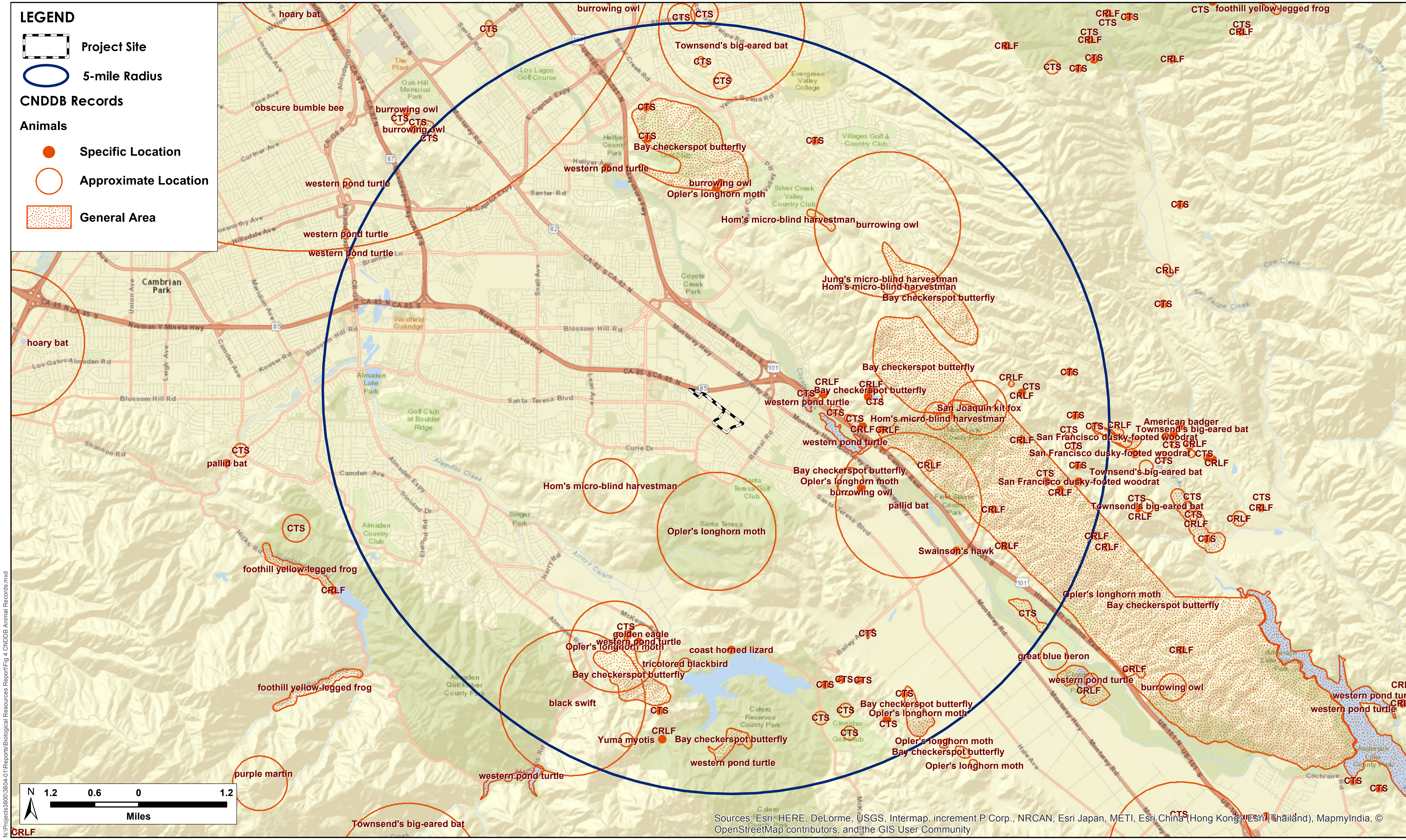

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Figure 4. California Natural Diversity Database Wildlife Records
Equinix Data Center and Santa Teresa Substation Project
Biological Resources Report (3804-01)
November 2015

status species occur or have occurred previously, but they do not necessarily represent current conditions or indicate where species are absent.

Special-status Plants. The CNPS (2015) and CNDDB (2015) identify 116 special-status plant species as potentially occurring in the nine USGS quadrangles containing and/or surrounding the project site for CRPR 1 and 2 plants, and in Santa Clara County for CRPR 3 and 4 plants, as described in the *Methods* section above. CNDDB records within the general project site vicinity are shown in Figure 3. Of these 116 species, 115 were determined to be obviously absent from the project site due to one or more of the following reasons:

- A lack of specific habitat (e.g., coastal salt marsh) and/or edaphic requirements (e.g., serpentine or alkaline soils) for the species in question
- The elevation range of the species is outside of the range on the project site
- The species is known to be extirpated from the site vicinity

Marginally suitable habitat for the 116th species, Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*, CRPR 1B.1), does occur on the project site, and this species has been recently documented in disturbed ruderal grasslands in more northern portions of Santa Clara County. However, the majority of the ruderal grassland on the project site is underlain by soil in the Urbanland-Stevens Creek complex, and is not saline or alkaline, the latter of which is an edaphic requirement of Congdon's tarplant. In addition, the one CNDDB record in the project site vicinity is from 1908, and the population has since been extirpated. Further, no evidence of this species' presence was detected during the site visit. Thus, this species is not expected to occur on the project site.

Special-status Animals. The CNDDB (2015) identified several special-status animal species as occurring in the nine USGS quadrangles containing and/or surrounding the project site, as described in the *Methods* section above. CNDDB records within the project vicinity are shown in Figure 3. All special-status wildlife species identified during the background review were determined to be absent from the project site. Species considered for occurrence but rejected, as well as the reasons for their rejection, include the following (among others):

- The California tiger salamander (*Ambystoma californiense*), federally and state listed as threatened, and the California red-legged frog (*Rana draytonii*), federally listed as threatened and a California species of concern, occurred historically in the project region. However, the project site lacks suitable aquatic breeding habitat for these species. In addition, over the past 150 years California tiger salamanders and California red-legged frogs have been largely extirpated from the majority of the urbanized Santa Clara Valley floor in Santa Clara County, including the project site and surrounding vicinity. Although there are recorded occurrences of California tiger salamanders and California red-legged frogs within potential dispersal distance of the project site (i.e., 1.2 mi for the tiger salamander and 1.0 mi for the red-legged frog), the project site is separated from the nearest known occurrences of these species by U.S. 101, Monterey Road, and dense urbanization within the City of San Jose, all of which are effective dispersal barriers for both species. Further, the project site is not mapped as potential primary or secondary habitat for either species by the VHP. Thus, neither species is expected to occur on the project site.

- The Bay checkerspot butterfly (*Euphydryas editha bayensis*), federally listed as threatened, occurs on serpentine grasslands approximately 1.5 mi to the southeast of the project site at Tulare Hill, and approximately 1.7 mi east of the project site, on the east side of U.S. 101 (CNDDB 2015). However, the project site lacks serpentine grasslands and the butterfly's two larval food plants: California plantain (*Plantago erecta*) and owl's clover (*Orthocarpus densiflorus*). Further, the project site is not mapped as potential Bay checkerspot butterfly habitat by the VHP. Thus, the Bay checkerspot butterfly is not expected to occur on the project site.
- The project site lacks suitable habitat for the San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), a California species of special concern. Further, no nests of this species were detected during a focused survey of the project site. Thus, the San Francisco dusky-footed woodrat is determined to be absent.
- The limited extent of grassland on the project site and its isolation from more extensive open habitats in the region preclude the presence of wildlife species such as the grasshopper sparrow, loggerhead shrike, and northern harrier (*Circus cyaneus*), all of which are California species of special concern, as well as the white-tailed kite (*Elanus leucurus*), a fully protected species.
- The project site lacks aquatic habitat for the western pond turtle (*Actinemys marmorata*), a California species of special concern, and is separated from the nearest known occurrence of the species by several major roads and Valley floor commercial and residential development. Further, the project site is not mapped as potential western pond turtle habitat by the VHP. Thus, this species is determined to be absent.
- Ostensibly suitable habitat for one special-status wildlife species, the burrowing owl, a California species of special concern, is present on the proposed project site. However, neither burrowing owls nor signs of recent burrowing owl use (e.g., fecal material or feathers) were observed within the proposed project site during a focused survey. Further, the project site is not mapped as potential burrowing owl habitat (nesting or wintering) by the VHP, nor is it adjacent to mapped burrowing owl habitat (ICF International 2012), and there are no current or historical burrowing owl records from the project site. Thus, the burrowing owl is not expected to occur on the project site.
- An examination of trees on the site failed to find any large cavities that might provide potentially suitable bat roosting habitat. Therefore, the trees on site do not provide suitable habitat for a large roosting or maternity colony of bats.

Sensitive and Regulated Habitats

Compliance with CEQA Guidelines Section 15065(a) requires consideration of natural communities of special concern, in addition to plant and wildlife species. Vegetation types of "special concern" are tracked in the CNDDB. Further, the CDFW ranks sensitive vegetation alliances based on their global (G) and state (S) rankings analogous to those provided in the CNDDB and using NatureServe's (2015) standard heritage program methodology. Global rankings (G1–G5) of natural communities reflect the overall condition (rarity and endangerment) of a habitat throughout its range, whereas S rankings are a reflection of the condition of a habitat within California. If an alliance is marked as a G1–G3, all of the associations within it would also be of high priority. The CDFW provides the Vegetation Classification and Mapping Program's currently accepted list of vegetation alliances and associations (CDFW 2010).

Furthermore, aquatic, wetland and riparian habitats are also afforded protection under applicable federal, state, or local regulations, and are generally subject to regulation, protection, or consideration by the U.S. Army Corps of Engineers under Section 401 of the Clean Water Act (CWA) (waters of the U.S.), the Regional Water Quality Control Board under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act (waters of the state), the CDFW under Sections 1601–1603 of the Fish and Game Code, and/or the U.S. Fish and Wildlife Service (USFWS).

CDFW Sensitive Habitats. A query of sensitive habitats in the CNDDB (2015) identified one natural community of special concern, serpentine bunchgrass (G2/S2.2), as occurring in the project vicinity; however, the Urbanland soils that occur on the site (Natural Resources Conservation Service 2015) are not derived from serpentine parent material. Furthermore, few native plant species occur on the project site. In conclusion, the project site does not support riparian habitat, natural communities of concern, or sensitive vegetation alliances that are subject to the jurisdiction of the CDFW.

Waters of the U.S./State. No habitat observed within the project site possesses the field characteristics used by the federal and state regulatory agencies in defining their jurisdiction. As such, waters of the U.S. and/or state do not occur on the project site.

Biotic Impacts and Mitigation

Overview

The CEQA and its guidelines provides instruction in evaluating impacts of projects on biological resources and determining which impacts will be significant. The CEQA defines "significant effect on the environment" as "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." Under the CEQA guidelines (Section 15065), a project's effects on biotic resources are deemed significant where the project would:

A. "substantially reduce the habitat of a fish or wildlife species"
B. "cause a fish or wildlife population to drop below self-sustaining levels"
C. "threaten to eliminate a plant or animal community"
D. "reduce the number or restrict the range of a rare or endangered plant or animal"

In addition to the Section 15065 criteria that trigger mandatory findings of significance, Appendix G of the CEQA guidelines provides a checklist of other potential impacts to consider when analyzing the significance of project effects. The impacts listed in Appendix G may or may not be significant, depending on the level of the impact. For biological resources, these impacts include whether the project would**:**

E. "have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service"
F. "have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service"
G. "have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act"
H. "interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites"
I. "conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance"
J. "conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan"

Santa Clara Valley Habitat Plan

The proposed project is a "covered project" under the VHP (ICF International 2012). The Santa Clara Valley Habitat Agency (SCVHA) leads the implementation of the VHP. It is a regional partnership between six local partners, including the County of Santa Clara, Santa Clara VTA, the Santa Clara Valley Water District, and the Cities of San Jose, Gilroy, and Morgan Hill; the CDFW; and the USFWS. In 2013, the VHP was adopted by all local participating agencies, and permits were issued from the USFWS and CDFW. It is both a habitat conservation plan and natural community conservation plan, or HCP/NCCP. The planning document helps private and public entities plan and conduct projects and activities in ways that lessen impacts on natural resources, including specific threatened and endangered species. The VHP identifies regional lands (called reserves) to be preserved or restored to benefit of at-risk species, and describes how reserves will be managed and monitored to ensure that they benefit those species. In providing a long-term, coordinated planning for habitat restoration and conservation, the VHP aims to enhance the viability of threatened and endangered species throughout the Santa Clara Valley.

The VHP defines measures to avoid, minimize, and mitigate impacts on covered species and their habitats while allowing for the implementation of certain "covered projects". Chapter 6 of the VHP includes detailed and comprehensive conditions to avoid and minimize impacts to the 18 "covered species" (nine animal species and nine plant species) included in the plan area, which is comprised of 519,506 ac, or approximately 62% of Santa Clara County. These conditions are designed to achieve the following objectives:

- Provide avoidance of covered species during implementation of covered activities throughout the project site.
- Prevent take of individuals from covered activities as prohibited by law (e.g., take of fully protected species).
- Minimize impacts to natural communities and covered species where conservation actions will take place.
- Avoid and minimize impacts to jurisdictional wetlands and waters throughout the study area to facilitate project-by-project wetland permitting.

In conformance with the VHP, project proponents are required to pay impact fees in accordance with the types and acreage of habitat or "land cover" impacted, and to implement conservation measures specified by the VHP. Land cover impacts are used because it is the best predictor of potential species habitat, and is applicable to all of the covered species (with the exception of the burrowing owl). The SCVHA has mapped three fee zones in the VHP area: (A) ranchland and natural lands, (B), agricultural and valley floor lands, and (C) small vacant sites (SCVHA 2015). The following areas are exempt from land cover fees:

- All development that occurs on land mapped by the VHP as urban-suburban, landfill, reservoir (excluding dams), or agriculture developed land cover types
- Other exempt activities include urban development in fee zones A-C on parcels less than 0.5 ac
- Additions to structures within 50 ft of existing structure that result in less than 5000 ft of impervious surface so long as there is no effect on wetland or serpentine land cover types
- Construction of recreational facilities within the reserve system.

Additional fees in-lieu of providing compensatory mitigation are imposed for projects that impact serpentine habitat, wetlands, and burrowing owls, and for certain projects that result in atmospheric nitrogen emissions, although in some cases, project proponents may provide land to restore or create habitats types protected by the VHP in lieu of payment of fees.

The majority of the project site overlaps the VHP study area and Fee Zone B (Agricultural and Valley Floor Lands) (SCVHA 2015). There is no serpentine habitat or wetlands on the project site, and therefore, fees in lieu of mitigation for impacts to these habitat types would not be required. Because the proposed project entails new development, nitrogen deposition fees may apply.

This impact assessment summarizes the applicable fees and conservation measures that are required by the VHP. Chapter 6 of the VHP (ICF International 2012) is included in Appendix A for reference. The impact analysis below provides the VHP conditions that apply to the proposed project. Other conditions that are species-specific are described in the appropriate sections in this chapter based on the project-specific assessment of potential impacts.

Condition 1- Avoid Direct Impacts on Legally Protected Plant and Wildlife Species

Wildlife Species Protected Under Other Laws. Several wildlife species that occur in the proposed project vicinity are protected under other state and federal laws. Some of these animal species are listed as fully protected under California Fish and Game Code (e.g., American peregrine falcon [*Falco peregrinus anatum*] and white-tailed kite), and eagles are protected under the Bald and Golden Eagle Protection Act. Further, all migratory bird species and their nests are protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code. Actions conducted under the VHP must comply with the provisions of the MBTA and California Fish and Game Code.

Condition 3. Maintain Hydrologic Conditions and Protect Water Quality

Condition 3 applies to all projects and identifies a set of programmatic best management practices (BMPs), performance standards, and control measures to minimize increases of peak discharge of storm water and to reduce runoff of pollutants to protect water quality, including during project construction. These requirements include pre-construction, construction site, and post-construction actions. Pre-construction conditions are site design planning approaches that protect water quality by preventing and reducing the adverse impacts of stormwater pollutants and increases in peak runoff rate and volume. They include hydrologic source control measures that focus on the protection of natural resources. Construction site conditions include source and treatment control measure to prevent pollutants from leaving the construction site and minimizing site erosion and local stream sedimentation during construction. Post-construction conditions include measures for stormwater treatment and flow control.

No Impact

Impacts on Special-status Plants and Animals. As described above, suitable habitat is not present on the Project site for any special-status plant species, and presence of special-status animals is precluded by the combination of a lack of suitable habitat and the presence of extensive development in surrounding areas. Therefore, there would be no impact on special-status plants or animals due to the proposed project.

Less-than-significant Impacts

Impacts on Upland Habitats and Associated Common Plant and Wildlife Species

The proposed project would result in the permanent loss of up to 23.74 ac of upland habitats, including 1.04 ac of developed/landscaped areas and 22.71 ac of ruderal grassland. In addition, the project would temporarily impact 5.35 ac of developed/landscaped areas and 0.28 ac of ruderal grassland. Ruderal grassland is relatively abundant and widespread regionally, is not particularly sensitive, and does not provide habitat for special-status plant or wildlife species. Impacts on both upland habitat types would result in impacts on common (i.e., non-special-status) plant and animal species that occur there. These species would experience a direct loss of habitat due to the project from the mortality, injury, disturbance, and displacement of individuals of some of these species. Additionally, loss of habitat and displacement of individuals could have indirect effects on populations and habitats outside of the project site by increasing concentrations of individuals, leading to increases in intra- and interspecific competition and increased pressure on available resources.

However, plant and wildlife species that occur on the project site are common, regionally abundant, are present in widely available habitats in the region, and may continue to be present on some portions of the site following construction. Additionally, the proposed project would impact only a small proportion of their regional populations, and the number of individuals likely to be displaced by habitat disturbance and loss would be quite small with respect to the amount of suitable habitat available in the area. Thus, impacts on these common species and their habitats resulting from project activities would not meet the threshold of having a *substantial* adverse effect, and would not be considered significant under CEQA.

Impacts Found to Be Less than Significant with Mitigation

Impacts on Protected Trees

The City Municipal Code (Chapter 13 Section 28.220) states that unlawful pruning or removal of street trees (located in public right-of-ways) and/or heritage trees is prohibited without obtaining a permit. Any tree planted on a street is protected by this ordinance. Permits to prune or remove street trees are issued by the Department of Transportation, whereas permits to impact ordinance-sized and heritage trees can be obtained from the Department of Planning, Building, and Code Enforcement.

Project activities have the potential to permanently impact up to 12 ordinance-sized trees that are protected under the City's Municipal Code. The location, size (DBH), and species of each ordinance-sized tree in the impact area of the project site are provided in a separate memorandum that presents the results of the tree survey conducted in October and November 2015 (H. T. Harvey & Associates 2015). It should be noted that additional trees occur within the project site, but not in the impact area as it is currently designed. Therefore, we have assumed that those additional trees will not be impacted.

Trees in the impact area are scattered and do not form a dense overstory, and thus, tree removal would not substantially increase incident sunlight reaching the vegetation below. However, five ordinance-sized trees are native oak species (coast live oak and valley oak). Furthermore, seven of the 12 ordinance-sized trees are exceptionally old (likely over 150 years) and large, including two valley oaks with DBH measurements ranging from 60 to 81 inches and have extensive canopy spreads. The majority of ordinance-sized trees (nine individuals) appeared to be in good or excellent health at the time of the tree survey. As a result, the ecological impact of removing ordinance-sized trees would be substantial. In addition, the project will temporarily impact up to 59 street trees in the right-of-way along Via Del Oro. Pruning of these street trees as part of the project is also regulated by the City. Owing to the proposed project's conflicts with the City's Municipal Code and Envision (City 2012), impacts on protected trees are potentially significant. In conclusion, the removal or pruning of protected trees as part of the project would conflict with impact criteria "I" (local policies or ordinances protecting biological resources) listed under Appendix G of the CEQA Guidelines, and would be considered significant. Implementation of Mitigation Measures BIO-1a (Avoidance and Preservation of Trees) and BIO-1b (Compensation for Impacts on Protected Trees) will reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1a: Avoidance and Preservation of Trees

During the detailed design of project activities, ordinance-sized trees will be avoided to the extent feasible. If it is determined that impacts on some trees can be avoided, a construction-phase Tree Preservation Plan shall be prepared by a certified arborist prior to initiation of construction to describe how trees that will not be removed will be protected. The construction-phase Tree Preservation Plan shall include the following tree protection measures, which are based on guidelines established by the International Society for Arboriculture:

- Establish an area surrounding individual trees or groups of trees to be protected during construction as defined by a circle concentric with each tree with a radius 1-1/2 times the diameter of the tree canopy drip line. This "tree protection zone" is established to protect the tree trunk, canopy and root system from damage during construction activities and to ensure the long-term survival of the protected trees. The tree protection zone shall: (1) ensure that no structures or buildings, that might restrict sunlight relative to the existing condition, will be constructed in close proximity to the trees; and (2) that no improvements are constructed on the ground around the tree within the tree protection zone, thus ensuring that there is sufficient undisturbed native soil surrounding the tree to provide adequate moisture, soil nutrients and oxygen for healthy root growth.

- Protect tree root systems from damage caused by (a) runoff or spillage of noxious materials while mixing, placing, or storing construction materials and (b) ponding, eroding, or excessive wetting caused by incident rainfall through use of the following measures during excavation and grading:

    - Excavation: Do not trench inside tree protection zones. Hand excavate under or around tree roots to a depth of 3 ft. Do not cut main lateral tree roots or taproots. Protect exposed roots from drying out before placing permanent backfill.

    - Grading: Maintain existing grades within tree protection zones. Where existing grade is 2 inches or less below elevation of finish grade, backfill with topsoil or native soil from the project site. Place fill soil in a single un-compacted layer and hand grade to required finish elevation.

    - Apply 6-inch average thickness of wood bark mulch inside tree protection zones. Keep mulch 6 inches from tree trunks.

- Provide 48-inch tall orange plastic construction fencing fastened to steel T-posts, minimum 6 ft in length, using heavyweight plastic ratchet ties. Install fence along edges of tree protection zones before materials or equipment are brought on site and construction operations begin. Maintain fence in place until construction operations are complete and equipment has been removed from site.

- Provide temporary irrigation to all trees in protection zones using a temporary on-grade drip or bubbler irrigation system sufficient to wet the soil within tree protection zones to a depth of 30 inches per bi-weekly irrigation event.

Mitigation Measure BIO-1b: Compensation for Impacts on Protected Trees

To the extent that the construction-phase tree protection measures, described above under *Mitigation Measure BIO-1a*, are not feasible, the project proponent will comply with the standards of the permit issued by the City's Department of Planning, Building, and Code Enforcement for the removal of ordinance-sized trees, and the permit issued by the Department of Transportation for pruning street trees. Furthermore, the project proponent will provide compensatory mitigation, both in number and spread of canopy to remain in compliance with Envision Goal MS-21.5 (City 2012). In areas where the improvements associated with development have encroached within the tree canopy drip line, and where trees have been removed entirely, all ordinance-sized trees affected shall be replaced at a 1:1 ratio, unless otherwise specified in the conditions of the aforementioned permits. A certified arborist will review the development areas after all construction has been completed. The replacement trees will be standard 24-inch box size trees or larger. Replanting shall occur in appropriate habitat in the City within 6 months of tree removal. Replacement trees should be comprised of species that have low water requirements and are well adapted to the Mediterranean climate of the Santa Clara Valley. Assemblages of diverse species should be selected to prevent monocultures that are vulnerable to pest invasions.

Compliance with Additional Laws and Regulations Applicable to Biotic Resources of the Project Site

Regulatory Overview for Nesting Birds

Construction disturbance during the breeding season (February 1 through August 31, for most species) could result in the incidental loss of eggs or nestlings, either directly through the destruction or disturbance of active nests or indirectly by causing the abandonment of nests. This type of impact would not be significant under CEQA for the species that could potentially nest on the Project site due to the local and regional abundances of these species and/or the low magnitude of the potential impact of the Project on these species (i.e., the Project is only expected to impact one or two individual pairs of these species, which is not a significant impact to their regional populations). However, we recommend that the following measures be implemented to ensure that Project activities comply with the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code and Condition 1 of the VHP:

Measure 1. Avoidance. To the extent feasible, construction activities should be scheduled to avoid the nesting season. If construction activities are scheduled to take place outside the nesting season, all impacts to nesting birds protected under the MBTA and California Fish and Game Code will be avoided. The nesting season for most birds in Santa Clara County extends from February 1 through August 31.

Measure 2. Pre-construction/Pre-disturbance Surveys. If it is not possible to schedule construction activities between September 1 and January 31, then pre-construction surveys for nesting birds should be conducted by a qualified ornithologist to ensure that no nests will be disturbed during Project implementation. We recommend that these surveys be conducted no more than seven days prior to the initiation of construction activities. During this survey, the ornithologist will inspect all trees and other potential nesting habitats (e.g., trees, shrubs, ruderal grasslands, buildings) in and immediately adjacent to the impact areas for nests. If an active nest is found sufficiently close to work areas to be disturbed by these activities, the ornithologist will determine the extent of a construction-free buffer zone to be established around the nest (typically 300 feet for raptors and 100 feet for other species), to ensure that no nests of species protected by the MBTA and California Fish and Game Code will be disturbed during Project implementation.

Measure 3. Inhibition of Nesting. If construction activities will not be initiated until after the start of the nesting season, we recommend that all potential nesting substrates (e.g., bushes, trees, grasses, and other vegetation) that are scheduled to be removed by the Project be removed prior to the start of the nesting season (e.g., prior to February 1). This will preclude the initiation of nests in this vegetation, and prevent the potential delay of the Project due to the presence of active nests in these substrates.

Please contact me by email at gbolen@harveyecology.com or by phone at (408) 458-3246 if you have any questions regarding this report. Thank you very much for contacting H. T. Harvey & Associates regarding this Project.

Sincerely,

Ginger Bolen, Ph.D.
Project Manager/Senior Wildlife Ecologist

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Appendix A. Valley Habitat Plan, Chapter 6.

Chapter 6
Conditions on Covered Activities and Application Process

6.1 Introduction

As required by ESA (Section 10[a][2][A][ii]) and Fish and Game Code Sections 2820 (a)(6) and 2820(f), this Plan includes measures to avoid and minimize take of covered species. These measures to avoid and minimize impacts are described as *conditions on covered activities* and are designed to achieve the objectives listed below.

- Provide avoidance of covered species during implementation of covered activities throughout the study area.
- Prevent take of individuals from covered activities as prohibited by law (e.g., take of fully protected species).
- Minimize adverse effects on natural communities and covered species where conservation actions will take place.
- Avoid and minimize impacts on jurisdictional wetlands and waters throughout the study area.

In the context of effects on covered species, one of the greatest benefits of an HCP/NCCP is that mitigation for individual projects can be implemented systematically on a regional scale. This enables a more comprehensive approach to conservation that concentrates protection where it has the greatest value. The Plan also restricts covered activities in high-value land cover types (e.g., wetlands, serpentine grassland) and for some species (e.g., covered plants and selected covered wildlife species). By protecting high-quality areas in the Reserve System and restricting covered activities in areas of higher biological value, regional avoidance and minimization goals are supported.

This chapter describes conditions on covered activities that help meet regional avoidance and minimization goals. Regional avoidance and minimization reduces the need for individual projects to avoid and minimize impacts at the project scale and allows streamlining of regulatory requirements. This Plan assumes that take will result from individual covered activities and that this take will be mitigated through the conservation strategy (Chapter 5). Most activities covered under this Plan are required to provide limited documentation of field conditions to verify these assumptions (see Section 6.2 *Exemptions from Conditions*).

Avoidance and minimization measures are regulated by federal, state, and local programs. The conditions on covered activities (avoidance and minimization measures), described in this chapter do not supersede requirements by other agencies and are not intended to provide a basis for non-compliance with other applicable design guidelines required by other federal, state, and local agencies.

This chapter also describes the application process for individual projects to request coverage under this Plan. The application process is described in detail at the end of this chapter in Sections 6.7 *Receiving Take Authorization under the Plan* and 6.8 *Habitat Plan Application Package*. The conditions on covered activities and application process are included in this chapter together so that project proponents have one location in this document in which all requirements are described.

The NCCP Act requires that the Permittees get concurrence from the Wildlife Agencies before adopting, amending, or approving any plan or project that is inconsistent with the objectives and requirements of this Plan[1]. The conditions described in this chapter are designed to ensure this consistency and provide standard and predictable requirements for project applicants. However, Permittees may need to adopt or impose additional conditions beyond those described in this chapter for unanticipated projects or effects in order to ensure consistency with the Habitat Plan and compliance with the NCCP Act. The Permittees will evaluate all projects respective to their authorities to ensure that all applicable conditions described in this chapter have been incorporated into the project prior to extending take coverage under the Plan. Chapter 8 describes applicant responsibilities in the application process.

In addition to the conditions described in this chapter to avoid and minimize impacts, covered activities may also require payment of mitigation fees (see Chapter 9), provision of land in lieu of mitigation fees (see Chapter 8), or habitat restoration or creation in lieu of wetland fees.

6.2 Exemptions from Conditions

Many projects within the study area do not disturb the ground or have little or no measurable impact on the covered species or natural communities. Because the probability of take is so low, the need to enforce conditions on the projects and activities specified below would not provide a net benefit for species. Therefore, these covered activities are not subject to the conditions described in this chapter. Quantifiable impacts associated with activities exempt from conditions of the Habitat Plan will be reported in the Application Package (see Section 6.8, below) (impacts that cannot be quantified will not be tracked). Although these covered activities are exempted from the conditions, all of them receive take coverage (**Table 6-1**).

[1] Fish and Game Code Section 2820(b)(3).

Exemptions based on land cover types are based on the mapping for this Plan at the time of permit issuance and the nature of covered activities previously permitted on the site.

Many of the covered activities exempt from the conditions in this chapter may also be exempt from the Habitat Plan fees, as described in Chapter 9, Section 9.4.1 *Habitat Plan Fees*. The association between covered activities exempt from conditions on covered activities and Habitat Plan fees are shown in **Table 6-1**.

The following activities and projects are exempt from all of the conditions in this chapter and are not tracked as impacts by the Implementing Entity (as described above)[2].

- Projects that do not result in ground disturbance do not result in release of potential water quality contaminants, or do not create new wildlife barriers.
- Private-sector, routine-maintenance activities that require a development, grading, or building permit, and that occur inside the urban service area (private-sector activities that do not require a development, grading, or building permit are not covered by the Plan or its conditions or fees).
- Private-sector, routine-maintenance activities that require a development, grading, or building permit; that occur outside of the urban service area; and that occur within 50 feet of all existing structures at the time of Plan commencement or within 50 feet of structures that were permitted for incidental take under the Habitat Plan.
- Any covered activity described in Chapter 2 that occurs in urban-suburban, landfill, reservoir[3], or agriculture developed[4] land cover types as verified in the field, unless the activity may affect a mapped or unmapped stream, riparian, serpentine, pond, or wetland land cover types, or the activity is located in a stream setback (see Condition 11 for a discussion of stream setbacks).
- Routine infrastructure maintenance by public agencies within the planning limit of urban growth that do not affect stream, riparian, serpentine, ponds, or wetland land cover types.
- Routine infrastructure maintenance by public agencies that occurs in urban-suburban, landfill, reservoir, or agriculture developed land cover types that do not affect stream, riparian, serpentine, pond, or wetland land cover types. Examples of such activities include filling pot-holes and resurfacing existing roads without expansion of the paved area.

[2] Project proponents are still required to comply with survey and avoidance requirements for applicable local, state, and federal laws not addressed by the Habitat Plan (e.g., local tree ordinances, state fully protected species, the federal Migratory Bird Treaty Act).
[3] “Reservoir” does not include the dam face. Exemptions described in this chapter do not apply to projects impacting the face of covered dams.
[4] The land cover type “agriculture developed” (also known as agriculture developed/covered ag) is defined in Chapter 3 as intensive agricultural operations such as nurseries and greenhouses.

The following activities[5] are also exempt from all conditions in this chapter but will be tracked by the Implementing Entity as impacts when they occur on natural land cover types.

- Additions to existing structures or new structures that are within 50 feet of an existing structure (e.g., a new garage) that result in less than less than 5,000 square feet of impervious surface so long as no stream, riparian, wetlands, ponds, or serpentine land cover type are affected. Additions are cumulative and must be calculated based on the footprint of the structure at time of Plan implementation to determine whether this threshold has been crossed.
- A covered activity on a parcel of less than 0.5 acre or less as long as no serpentine, stream, riparian, pond, or wetland land cover type is within the parcel.

A project proponent of a covered activity in the Plan will not be required to comply with the conditions in this chapter or pay any Habitat Plan fees if the proponent of the activity provides written confirmation to the Implementing Entity that the CDFG and USFWS have determined that the activity is not subject to CESA and ESA, respectively; or has already received the necessary take authorizations under CESA and ESA; or has otherwise complied with CESA and ESA. An activity will be deemed to be in compliance with CESA and ESA by the Implementing Entity and thus be exempt from the conditions in this chapter and otherwise comply with the Habitat Plan if the proponent provides the following:

1. Letters from both USFWS and CDFG that specifically refers to the activity and states that the activity is not likely to result in take of any federally or state listed species and will not preclude successful implementation of the conservation strategy for all covered species, or
2. A copy of an incidental take permit issued by CDFG for the activity, and copies of incidental take statements or incidental take permits issued by USFWS that authorize the incidental take associated with the proposed activity.

Additional covered activities are exempt from species surveys, as described in Section 6.8.5 *Item 5: Results of Applicable Species Surveys and Monitoring*, below.

Activities or projects listed in Chapter 2, Section 2.4 *Projects and Activities Not Covered by this Plan*, are specifically excluded from coverage under this Plan and therefore cannot receive take authorization, are not subject to the conditions in this chapter, and do not pay Habitat Plan fees (see Section 2.4 for additional information on these excluded activities and projects). These projects are listed below.

[5] Although private development that does not meet the criteria described in Section 2.3.2 *Urban Development* subheading *Private Development Coverage Area* and additions of less than 5,000 square feet of new impervious surface (regardless of parcel size) are not subject to the Plan, project proponents may choose to opt into the Plan. If project proponents seek to have these activities covered, the bulleted exemptions apply.

- Private sector activities that do not obtain a development, grading, building, or other construction permit involving land disturbance for the purposes of making land improvements, such as the construction of buildings, roads, and driveways ("building permits" referenced herein do not include plumbing, electrical, or mechanical permits). Activities that do not obtain these development permits are not covered by the Plan.
- SCVWD Stream Maintenance Program activities.
- City of Gilroy expansion beyond the Plan’s planning limit of urban growth.
- Bay Area to Central Valley high-speed train.
- New highway between I-5 and U.S. 101.
- Routine and ongoing agricultural activities or expansion of cultivated agriculture into natural land cover types, including vineyard development, that does not seek discretionary approval or permitting by the local jurisdiction.
- Timber harvest operations.
- Quarries and other mining other than expansion of Freeman Quarry (except as otherwise noted).
- New and expanded landfills other than Kirby Canyon, Pacheco Pass Landfill expansions, and landfills occurring inside the planning limit of urban growth of the three cities.
- Mercury removal/remediation (unless described in Chapter 2 as a covered activity).
- Corps led projects.
- Pacheco dam reconstruction and reservoir enlargement.
- Pesticide/ herbicide application for the federal permit.
- Installation and operation of groundwater wells (except as otherwise noted).
- Increased development due to incorporation of San Martin.
- Dam removal and/or construction of new dams.
- Wind farm development.
- Water importation from outside the SCVWD service area.
- Emergency activities.

6.3 Conditions on All Covered Activities

The conditions below are categorized and described in several ways: by activity type, by natural community, and by species. Collectively they provide for regional and site-specific avoidance and minimization of impacts on covered species and sensitive land cover types. It is the responsibility of project proponents to design and implement their projects in compliance with these conditions. For private projects, the applicable local jurisdictions will review project compliance with the conditions in this chapter. The Local Partners will determine best adherence to conditions where discretion exists. If a project applicant proposes to use a less preferable design option (e.g., a culvert instead of a free-span bridge), the project applicant must demonstrate why a preferred option is infeasible. For private applicants, local jurisdictions will determine if this rationale is sufficient under these circumstances.

Conditions on covered activities, including avoidance and minimization measures identified for certain covered activities and species-specific measures, may be revised over the course of the permit term based on results of implementation through the adaptive management process. Proposed revisions will be reviewed by the Wildlife Agencies upon submission of each annual report to ensure the successful implementation of the conservation strategy. Agencies will review and respond within 30 days. Revisions to conditions will be approved by the Wildlife Agencies prior to the Permittees adopting revised conditions. Allowing such revisions will ensure that out-of-date or unsuccessful management techniques do not persist and that best available science can be incorporated into the conditions as appropriate for the Plan.

Compliance with the Habitat Plan does not preclude compliance with all other applicable state and federal laws. It is the project proponent’s responsibility to ensure compliance with all applicable laws and regulations.

All projects that discharge dredged or fill material into waters of the United States, including federal jurisdictional wetlands, are required to obtain applicable permits (e.g., Clean Water Act Section 404 and Section 401) from the Corps and the Regional Board. Projects that place fill, alter the bed bank or channel, or divert the flow of streams, alter portions of streams above the ordinary high water mark, alter streams that lack a nexus to navigable waters, wetlands, or lakes under the jurisdiction of the state only are required to obtain a waste discharge requirement from the Regional Board and enter into a streambed alteration agreement with CDFG[6]. Any project that requires a permit from the Corps, Regional Board, or CDFG for impacts on streams and other aquatic areas may be subject to avoidance and minimization requirements. Those requirements may differ from the avoidance and minimization requirements in this Plan.

Condition 1, described below, pertains to all covered activities. Other conditions specifically pertain to certain types of activities, certain species, or certain natural communities and are enumerated in subsequent sections.

[6] Activities covered by this Plan that need a streambed alteration agreement are expected to fully meet the standards of the streambed alteration agreement through compliance with this Plan for species covered by the Plan.

Condition 1. Avoid Direct Impacts on Legally Protected Plant and Wildlife Species

Contra Costa Goldfields

Contra Costa goldfields is a federally endangered and CNPS 1B plant species whose extreme rarity precludes coverage under the Habitat Plan. Because the Habitat Plan does not cover the species, compliance is required on an individual basis.

The likelihood of discovery of new occurrences is very low. If a new occurrence of this species is found, its avoidance would be of the highest importance to the species' viability. If an applicant encounters Contra Costa goldfields on their site, they will contact the USFWS for written concurrence of avoidance to ensure that the project does not jeopardize the continued existence of the species.

Wildlife Species Protected Under Other Laws

Several wildlife species that occur in the study area are listed as fully protected, as defined under Sections 3511 and 4700 of the California Fish and Game Code. As described in Chapter 1, CDFG cannot issue permits for take[7] of these species. Fully protected species that are known or likely to occur in the study area are listed below.

- Golden eagle.
- Bald eagle.
- American peregrine falcon.
- Southern bald eagle.
- White-tailed kite.
- California condor.
- Ring-tailed cat (= ringtail).

Three of the fully protected raptor species—white-tailed kite, peregrine falcon, and golden eagle—forage widely throughout the study area but nest in discrete locations. Bald eagles are rare winter migrants to Santa Clara County but have been known to breed in the San Francisco Bay Area. A California condor population has been established in San Benito County (Pinnacles National Monument) and birds forage occasionally in Santa Clara County. Additionally, ringtails may be found in some riparian woodlands in the study area.

Further, all migratory bird species and their nests are protected under the Migratory Bird Treaty Act (MBTA). All birds listed above and those covered by

[7] Take is defined more narrowly in the California Fish and Game Code than in the ESA; see Chapter 1, *Introduction*, for details.

the Plan (western burrowing owl, least Bell's vireo, and tricolored blackbird) are considered migratory birds and subject to the prohibitions of the MBTA. Actions conducted under the Plan must comply with the provisions of the MBTA and avoid killing or possessing covered migratory birds, their young, nests, feathers, or eggs. As described in Chapter 1, the ESA incidental take permit, once issued by USFWS, will automatically function as an MBTA Special Purpose Permit, as specified under 50 CFR Sec. 21.27, for least Bell's vireo (the only migratory bird listed as threatened or endangered under the ESA) for a 3-year term subject to renewal by the Permittees (see Appendix 5 in U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996). Should any other of the covered migratory birds become listed under the ESA during the permit term, the ESA permit would also constitute a Special Purpose Permit under the MBTA for that species for a 3-year term subject to renewal by the Permittees.

Golden eagle and bald eagle are also protected under the Bald and Golden Eagle Protection Act. Take of golden eagle or bald eagle includes "impacts that result from human-caused alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment" (72 FR 31133).

6.4 Conditions on Specific Covered Activities

Conditions 2–10 pertain to seven specific categories of covered activities: urban development, in-stream capital projects, in-stream operations and maintenance, rural capital projects, rural operations and maintenance, rural residential development, and Plan implementation.

6.4.1 Urban Development

Urban development is defined as development occurring inside the urban service area of the three Local Partner cities. Although urban development is assumed in the impact analysis to occur throughout the planning limit of urban growth of each city over the 50-year Habitat Plan permit term, the density of development is not assumed to be urban unless the area is also inside of the urban service area.

There are two conditions on new urban development required by the Plan. Conditions on urban development are limited because of the generally low biological value of resources within urban areas[8]. The two general exceptions are the urban fringe and stream resources. Condition 2 below addresses the edge of new urban development in relationship to the Reserve System; in-stream activities are addressed in subsequent conditions.

[8] See Chapter 3 for the rationale for this assumption and Chapter 5 for identification of selected sites in urban areas with high-value resources.

Condition 2. Incorporate Urban-Reserve System Interface Design Requirements

For the purposes of this Plan, the urban-Reserve System interface is defined as the zone between existing and future urban development and the Reserve System. Because the study area includes three cities, development is anticipated adjacent to the Reserve System in some locations. Because of the influence of urban land uses it is anticipated that some areas generally unsuitable for covered species will border some of the Reserves. Urban buildout adjacent to reserves has the potential to directly or indirectly adversely affect covered species and natural communities within the Reserve System. Sources of such adverse effects may include vandalism, dumping of trash, trampling, unauthorized mountain bike or off-road vehicle use; runoff from adjacent streets and landscaped areas containing lawn fertilizer, pesticides, and vehicle waste (petroleum byproducts); introduction of invasive nonnative species (e.g., pampas grass, French broom, Argentine ants, giant reed); lights and noise from nearby development; unregulated movement of domestic animals; and the potential for covered species to enter developed or urban areas.

Beyond minimizing such direct and immediate impacts, the design of the urban-Reserve System interface will consider indirect and long-term effects, such as runoff from developed areas[9] that can transport harmful substances (e.g., pesticides, automotive fluids, sediment) into reserves; establishment of invasive nonnative species that can disperse from nearby landscaped areas; and structural and biological damage (e.g., soil compaction, creation of unauthorized trails, disturbance of sensitive species) that can result from unmanaged human access and use.

The interface design will address the following key questions, which are based on those proposed by Kelly and Rotenberry (1993) for urban reserves in California.

- What external forces or processes may have a negative impact on covered species and habitats at or near the reserve boundary?
- To what extent are those external forces likely to penetrate the boundary and result directly or indirectly in negative impacts on covered species and habitats? (How permeable is the boundary?)
- Which covered species are likely to exit the reserve and expose themselves to increased risk of injury or death?
- What structures can be built or programs implemented to prevent or mitigate these impacts? For example, how can boundary permeability be altered?

With these questions in mind, site-specific interface design requirements were developed to reduce negative impacts of development on covered species and to

[9] In general, development in the permit area will occur downslope from Habitat Plan reserves, so runoff should flow away from reserves. However, because construction grading often alters local drainage patterns, some runoff could flow into reserves if precautions are not taken.

help reduce conflicts if wildlife moves outside the Reserve System. The following sections (*Design Requirements*) describe requirements and opportunities for reducing impacts on covered species and natural communities on Reserve System lands adjacent to urbanized areas.

Design Requirements

New urban development that occurs adjacent to reserves or areas with moderate or high priorities for land acquisition (see Chapter 5, Section5.3.1 *Land Acquisition and Restoration Activities*) will incorporate design requirements at the urban-Reserve System interface to minimize the indirect impacts of development adjacent to existing reserves. The relevant jurisdiction (city or County) will determine which development projects are subject to this condition, as well as which components may be required for a particular development. The Implementing Entity will provide technical assistance when needed. Design requirements to be incorporated in new development at the urban-Reserve System interface, include those listed below.

- Locate the proposed development as far from the reserve boundary as possible consistent with other onsite conditions and constraints.
- Where new development occurs, roads will be placed on the interior of the development (i.e., away from the reserve boundary) to reduce the incidence of domestic pets entering the reserves and to isolate this hazard for wildlife that might enter urban areas from the reserves.
- Fences adjacent to yards or home sites will be designed to minimize the risk of pets escaping private yards and entering reserves (e.g., fences will be as tall as permitted by city and county codes, with no spaces between slats).
- Fences shared with reserve boundaries will not contain any gates between the private property and reserve to prevent entrance and trampling of sensitive species or illegal dumping (legal access to reserves will be provided at recreation staging areas).
- No private gates into the Reserve System will be allowed unless required by a pre-existing access easement and identified as an exception by the Implementing Entity.
- Public roads adjacent to reserves (e.g., a road that is aligned parallel to a reserve boundary) will be fenced to reduce unauthorized public access. Locked gates will be inspected regularly to identify any unauthorized locks.
- Development will be designed to minimize the length of the shared boundary between urban areas and the reserves (i.e., minimize the urban edge).
- Outdoor lighting will be of low intensity and will utilize full cutoff fixtures to reduce light pollution of the surrounding natural areas.
- Use of high-intensity lighting (e.g., recreation facilities, commercial parking lots) near reserves will be avoided or, if necessary, placed as low to the

ground as possible and directed away from the reserves to minimize long-distance glare.

- Public facilities such as ballparks and fields that require high-intensity night lighting (i.e., floodlights) will be sited at least 0.5 mile from the reserve boundary to minimize light pollution. Facilities may be sited closer to the Reserve System if the Implementing Entity determines that the lighting system will not be intrusive to wildlife within the Reserve System (e.g., hills block the lighting).
- For any landscaping, non-invasive plants will be required and use of native plants is highly encouraged, consistent with County landscaping guidelines (County of Santa Clara 2009).
- Natural or artificial barriers or other access restrictions may be installed around development to protect sensitive land cover types and covered species in the reserves. Barriers will be designed so they are appropriate for site conditions and resources protected. Some barriers should keep undesirable pets outside of the Reserve, other barriers should keep covered species inside the Reserve, while others should do both. Before installation of a barrier, consider if the area is used by covered species for movement, if the barrier would prevent movement critical for species life cycle, or if the barrier would encourage species to use other less favorable crossings.

Any design requirements incorporated into projects at the urban-Reserve System interface will be located within the development (i.e., not on the Reserve System) with the exception of the fuel buffer described in Condition 10 below. These features will be maintained by the property owners. The Implementing Entity will monitor compliance with these conditions along the reserve boundary concurrent with other monitoring activities described in Chapter 7. Violations will be reported to the applicable local jurisdiction for enforcement.

Although they are not under obligation or requirement, existing developments located adjacent to reserves or lands identified as land acquisition targets for Plan reserves are encouraged to adopt and implement as many of these design requirements as practicable. Local jurisdictions are encouraged to notify and involve the Implementing Entity during the design review process for large projects planned adjacent to the Reserve System.

In addition to the requirements identified above, several other requirements and avoidance and minimization measures are applicable to development near reserves. Project proponents will comply with the following conditions as appropriate.

- Condition 3. *Maintain Hydrologic Conditions*.
- Condition 7. *Rural Development Design and Construction Requirements*.
- Condition 10. *Fuel Buffer*.

Condition 3. Maintain Hydrologic Conditions and Protect Water Quality

This condition applies to all projects. The implementation of these projects could result in impacts on watershed health through changes in hydrology and water quality.

Currently, all Permittees have stormwater management plans that regulate new development and redevelopment as part of compliance with regulations under National Pollutant Discharge Elimination System (NPDES) permit requirements. An amendment to the Clean Water Act, the NPDES Program is a compliance permit regulating any point source pollution that is discharged into waters of the United States. The San Francisco Bay Regional Board administers the NPDES program in for the Coyote and Guadalupe watersheds. The Central Coast Regional Board administers the NPDES program for the Pajaro Watershed which includes Uvas, Llagas, and Pacheco subbasins. The purpose of this condition is to identify a consistent approach for applying the most important water quality conditions of each Regional Board across the study area (North and South County).

Site Design and Avoidance and Minimization Measures

Through development of stormwater management plans and complementary guidance manuals (Santa Clara Valley Urban Runoff Pollution Prevention Program 2006; City of Gilroy 2004; City of Morgan Hill 2004, 2008; Santa Clara Valley Water Resources Protection Collaborative 2006; Santa Clara Valley Water District 2008), the Permittees have identified a set of programmatic avoidance and minimization measures, performance standards, and control measures to minimize increases of peak discharge of stormwater and to reduce runoff of pollutants to protect water quality including during project construction. These avoidance and minimization measures originated, in part, from the measures that area typically required by the Regional Boards and CDFG for projects that have the potential to affect aquatic resources. Many of these avoidance and minimization measures also support the biological goals and objectives of this Habitat Plan. Implementation of these avoidance and minimization measures will reduce the potential for adverse impacts on covered species. **Table 6-2** lists avoidance and minimization measures for all water-related covered activities described in Condition 3, 4, and 5 of this Plan. Each local jurisdiction, or the Implementing Entity in the case of projects conducted by the Permittees, will verify that all appropriate measures in **Table 6-2** are implemented to minimize effects to covered species and their aquatic habitat (see Section 6.8.6). **Table 6-2** lists the source control measures and avoidance and minimization measures from the Permittees' existing stormwater management plans and complementary manuals that are most effective in protecting covered aquatic species and aquatic species habitat.

The requirements listed in **Table 6-2** include general, project design, construction, and post-construction avoidance and minimization measures. Project design measures are site design planning approaches that protect water quality by preventing and reducing the adverse impacts of stormwater pollutants and increases in peak runoff rate and volume. They include hydrologic source control measures that focus on the protection of natural resources and the reduction of impervious surfaces. Construction site conditions include source and treatment control measure to prevent pollutants from leaving the construction site and minimizing site erosion and local stream sedimentation during construction. Post-construction conditions include measures for municipal operations, stormwater treatment, and flow control.

In addition to the avoidance and minimization measures identified above, several other avoidance and minimization measures are identified in other conditions that will help reduce potential impacts to water quality in the study area. Project proponents will comply with the following conditions as appropriate.

- Condition 2. *Incorporate Urban Reserve System Interface Design Requirements*.
- Condition 4. *Stream Avoidance and Minimization for In-Stream Projects*.
- Condition 5. *Avoidance and Minimization Measures for In-Stream Operations and Maintenance*.
- Condition 7. *Rural Development Design and Construction Requirements*.
- Condition 8. *Implement Avoidance and Minimization Measures for Rural Road Operations and Maintenance*.
- Condition 11. *Stream and Riparian Setbacks*.
- Condition 12. *Wetland and Pond Avoidance and Minimization*.

6.4.2 In-Stream Projects

In-stream projects—such as flood protection projects, construction of new bridges and repair or rehabilitation of existing bridges or culverts, and water supply capital projects—have the capacity to affect wildlife, aquatic species, and habitats by introducing sediment discharge, disturbing earth and riparian vegetation, and altering hydrologic and hydraulic characteristics of water bodies. Condition 4 is designed to address such impacts.

Several of the in-stream covered activities described in Chapter 2 are also covered activities under the SCVWD proposed Three Creeks HCP. The conditions described below for in-stream projects, as well as for stream and riparian habitat and associated covered species (e.g., Condition 16), are consistent with the Three Creeks HCP.

Condition 4. Avoidance and Minimization for In-Stream Projects

The primary purpose of this condition is to identify design requirements and construction practices for in-stream projects to minimize impacts on riparian and aquatic habitat. The term *in-stream* is defined for the purposes of this Plan as the stream bed and bank and the adjacent riparian corridor. The adjacent riparian corridor encompasses all mapped riparian land cover (i.e., riparian forest and scrub natural community) immediately adjacent to a stream (see **Figure 3-10** for mapped land cover types). All in-stream projects must be designed to minimize adverse impacts on stream morphology, aquatic and riparian habitat, and flow conditions. Projects that may also affect wetlands or pond areas are addressed in Condition 12, *Wetland and Pond Avoidance and Minimization*.

All in-stream projects, including projects occurring in dewatered reservoirs, will adopt design requirement and construction avoidance and minimization measures to minimize impacts on covered species, natural communities, and wildlife movement. SCVWD and other Local Partners, such as County Parks, have developed avoidance and minimization measures for projects occurring in streams. The Fishery Network of Central California Coastal Counties (called "FishNet 4C" for the original four counties involved) developed the *County Road Maintenance Guidelines for Protecting Aquatic Habitat and Salmon Fisheries* (Fishery Network of Central California Coastal Counties 2004). This manual, while focused on road maintenance activities, provides avoidance and minimization measures that are applicable to all types of in-stream construction activities. **Table 6-2** summarizes these collected avoidance and minimization measures that are required conditions of in-stream covered activities. Avoidance and minimization measures in this table are applicable to the covered activities addressed in this condition as well as in Condition 3, *Maintain Hydrologic Conditions and Protect Water Quality* and Condition 5, *Avoidance and Minimization Measures for In-Stream Operations and Maintenance*. The avoidance and minimization measures address construction staging, dewatering, sediment management, vegetation management, bank protection, drainage, trail construction, and ground disturbance.

All avoidance and minimization measures listed in **Table 6-2** are required unless the avoidance and minimization measure is not appropriate for the activity or field data collected at the site or in comparable areas demonstrate that the avoidance and minimization measure would not benefit wildlife or reduce impacts on natural communities. The Implementing Entity will update the avoidance and minimization measures in **Table 6-2** over time so that they are more appropriate for implementing a specific covered activity or more beneficial for the covered species. Therefore, the Implementing Entity will update this list of avoidance and minimization measures over the permit term as appropriate to reflect new science and avoidance and minimization measure monitoring results. Proposed revisions will be reviewed by the Wildlife Agencies upon submission of each annual report to ensure the successful implementation of the conservation strategy. **Table 6-2** also includes additional avoidance and minimization measures drawn from those currently used by the Local Partners that strive to reflect current and forthcoming regulations and guidelines for in-stream project design (e.g., the State Water Board's *Wetland and Riparian Area Protection Policy*, described below).

Types of Projects Subject to Condition

The in-stream projects listed below are subject to the design requirements or construction practices because they are expected to result in impacts on creeks or streams.

- Installation or rehabilitation of flood protection projects and levee reconstruction.
- Bank stabilization projects.
- Geomorphic rehabilitation.
- Gravel enhancement.
- Bridge construction and replacement including vehicular, train, and pedestrian bridges throughout the study area.
- Development of trails in or through the in-stream area (stream bed, banks, and adjacent riparian land cover).
- Culvert installation or replacement.
- Dam repair and seismic retrofit, including dewatering events and development of borrow sites.
- Restoration projects throughout the study area, including creek realignment and erosion management.
- Operation, maintenance and replacement of existing water supply structures such as stream gauges, percolation ponds, and diversions.
- Any other activity that requires construction work within the in-stream area (stream bed, banks, and adjacent riparian land cover).

Design Requirements

Some impacts on stream and riparian land cover types are expected under the Plan (see **Tables 4-2 and 4-3**). All covered activities subject to this condition will implement the measures listed in **Table 6-2** associated with this condition to avoid or minimize impacts of covered activities on streams and riparian woodland/scrub.

- Applicants must also comply with Condition 7 *Rural Development Design and Construction Requirements* where applicable.
- Applicants for projects with streams on site must follow the setback requirements in Condition 11, *Stream and Riparian Setbacks*.

- Applicants for projects with wetlands or ponds on site must comply with Condition 12, *Wetland and Pond Avoidance and Minimization*.
- Applicants for transportation improvements that include stream crossings must comply with Condition 6, *Design Requirements for Covered Transportation Projects*.

Design Criteria for SCVWD Flood Protection Projects

Flood protection projects shall be designed with an objective to protect or enhance natural channel and habitat functions. Designs will be developed and selected to maintain or improve bank stability, minimize bed degradation or aggradation, protect or improve streambed substrate conditions, protect or increase habitat diversity and complexity, and minimize required maintenance. All covered flood control projects will incorporate the following design elements:

1. Flood protection projects will incorporate support for natural stream functions and allow for natural stream processes to occur consistent with the flood protection goals of the project. Approaches for flood protection will generally include excavation of flood benches based on natural geomorphic conditions, off-stream detention, set-back levees or floodwalls, biotechnical bank stabilization methods, and grade control.
2. Project design alternatives will consider habitat connectivity between the stream and the adjacent floodplain as an objective.
3. Project design alternatives will incorporate native riparian vegetation and in-stream habitat enhancement features, where feasible. Potential enhancement features will be evaluated during the project design review process described below.
4. Bypasses that convey all or a portion of flood flows into channels, tunnels, culverts, or other areas that are isolated from the natural stream will be used only when other options have been evaluated and found infeasible to meet flood protection goals. If used, bypasses will be designed considering local geomorphic and flood characteristics and will minimize impacts to in-stream habitat.

Review Process for Covered Flood Control and Levee Reconstruction Projects

1. Flood control and levee reconstruction projects shall be reviewed by the Wildlife Agencies as described in Chapter 8, Section 8.7.3 *Wildlife Agency Responsibilities*.
2. During the 60% project design stage(s), review and input from the Wildlife Agencies shall be solicited.
3. The Wildlife Agencies providing review will return comments within a mutually agreeable timeline to maintain project schedule. As described in Chapter 8, Section 8.7.3 *Wildlife Agency Responsibilities*, the Wildlife Agencies must review and approve flood control projects to ensure that they are consistent with Habitat Plan requirements.

Requirements for SCVWD Dewatering Events

The following conditions apply to the dewatering events conducted at SCVWD covered reservoirs. Dewatering events *are necessary* for seismic safety retrofit and major maintenance (see Chapter 2 for a description of these covered activities). Due to the unique characteristics at each dam site, a reservoir-specific dewatering plan will be submitted to the Wildlife Agencies for review and approval prior to the first dewatering event for each reservoir (see Chapter 8, Section 8.7.3 *Wildlife Agency Responsibilities* for details of this process). Dewatering plans will be reviewed and, if appropriate, updated prior to subsequent dewatering events during the permit term. Dewatering plans will address various issues as requested by the Wildlife Agencies during the covered activity review process or as required by the environmental compliance process and will include the following.

- Timing for the initiation and duration of the dewatering event, including the draining and refilling stages of the dewatering event.
- Average, minimum, and maximum flows expected during draining and refilling (flows will be within the limits described in **Table 2-4**) including the duration of periods in which the maximum reservoir release may be made.
- A schedule for re-operation according to applicable rules curves.
- The ability of SCVWD to bypass water or provide other supplemental sources downstream.
- Documentation of in-channel dryback conditions from the previous 3 years, if feasible, and an evaluation of potential increases in the length and duration of dryback related to the dewatering event.
- A qualitative assessment of total flows that could occur downstream of the dam when taking into account stream inflows other than reservoir releases (e.g., stormwater, urban runoff) based on monitoring done during the previous years to assess the level of potential dryback.
- A description of baseline monitoring conducted for California red-legged frog, foothill yellow-legged frog, and western pond turtle in channels to be affected by the drawdown to establish presence of covered species in the channel.
- A description of anticipated effects of the dewatering event on covered species.

In addition, minimization measures included in a dewatering plan could include, but are not limited to, the following.

- Releases will not result in the overtopping of the channel between May and July when western pond turtles are nesting.
- SCVWD will bypass reservoir inflow around the dam and/or provide other supplemental flows downstream of the reservoir.
- SCVWD will consider installing outlets that provide better control over release volumes (beneficial for subsequent dewaterings).

- SCVWD will ramp increases and decreases in flows during dewatering to avoid washing covered species downstream or drying back the channel faster than covered species can adapt and move to new locations.
- Surveys for covered species as required by this chapter prior to re-filling of the reservoir or other construction activities if the reservoir basin has been undisturbed for a period of time. Surveys may be limited to areas that were not disturbed during construction or that were not inundated before construction but may be after construction.
- As reservoir levels decline, the gravel trap at the upstream end of the reservoir, if present, will be isolated and lined to contain inflow to provide for a relocation site for rescued native fish, amphibians, and/or western pond turtle.
- The lined gravel traps will be designed to allow bypass of inflow through or around the reservoir.

6.4.3 In-Stream Operations and Maintenance

In-stream[10] operations and maintenance activities covered under this Plan—such as sediment removal, bank stabilization, vegetation management, and debris blockage removal to maintain flows—have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways or by disturbing riparian land cover associated with streams. Condition 5 specifies avoidance and minimization measures for covered operations and maintenance activities within and immediately adjacent to the stream channel. Note that SCVWD's Stream Maintenance Program is not a covered activity under this Plan and therefore not subject to the conditions of this chapter of the Plan.

Condition 5. Avoidance and Minimization Measures for In-Stream Operations and Maintenance

The purpose of this condition is to identify avoidance and minimization measures to be applied when conducting in-stream operations and maintenance activities. The measures will help reduce impacts on stream and riparian land cover types and covered species.

Types of Projects Subject to Condition

The following in-stream operations and maintenance activities are subject to the measures or construction practices described below because they are expected to result in impacts on creeks or streams.

[10] *In-stream* is defined for the purposes of the Plan as, "the stream bed and bank and the adjacent riparian corridor."

- Facility maintenance such as trail, bridge, road, and culvert repair and/or replacement in in-stream areas.
- Natural resource protection such as small bank stabilization projects and removal of debris deposited during flooding.
- Operations and maintenance of flood protection facilities (e.g., dams, armored creeks, detention ponds, streams). Activities may include vegetation management, minor sediment removal, or bank stabilization.
- Operations and maintenance of water supply facilities (e.g., flashboard dams, inflatable dams, stream gages, pipelines, and diversions).
- Non-routine stream maintenance activities conducted by SCVWD (i.e., those activities not covered by SCVWD's Stream Maintenance Program) including extensive removal of vegetation in the Lower Llagas flood control channel.
- Removal of debris blockages except in emergency situations.
- Mitigation and/or monitoring in creeks or adjacent riparian corridors.
- Vegetation management for exotic species removal, such as removal of giant reed, and native vegetation plantings.
- Reservoir dewatering events.
- Reservoir filling.

Avoidance and minimization measures listed in **Table 6-2** will apply to all streams in the project areas as well as to open canals, because these canals may provide habitat for covered species.

Stream Operation and Maintenance Activities

Several of SCVWD's Stream Maintenance Program avoidance and minimization measures were adapted for inclusion in **Table 6-2** and will be adopted for this Plan. Additional avoidance and minimization measures are identified below to ensure adequate avoidance and minimization of species covered under this Plan during implementation of stream operations and maintenance covered activities. These avoidance and minimization measures were informed by sources that include the Santa Clara Valley Resources Protection Collaborative *Guidelines and Standards* (Santa Clara Valley Water Resources Protection Collaborative 2006) and the SCVWD *Best Management Practices Handbook* (Santa Clara Valley Water District 2008). Throughout the permit term, avoidance and minimization measures listed in **Table 6-2** will be updated through the adaptive management process to reflect current best practices.

Dam Maintenance Program

All applicable measures in **Table 6-2** will apply to implementation of activities associated with the Dam Maintenance Program (see Chapter 2). In addition, activities requiring reservoir dewatering will comply with the requirements for dewatering reservoirs described above under Condition 4 *Stream Avoidance and Minimization for In-Stream Projects* and in Chapter 2.

Pipeline Maintenance Program

While SCVWD's Pipeline Maintenance Program is described in Chapter 2 under Section 2.3.6 *Rural Operations and Maintenance*, some activities have the potential to affect aquatic resources, particularly at blow-off sites. The following avoidance and minimization measures are from SCVWD's Pipeline Maintenance Program Final Program EIR (MHA Environmental Consulting 2007) and will be applied to Pipeline Maintenance Program covered activities in addition to other applicable avoidance measures described in this chapter.

- The discharge location and receiving water will be observed for signs of erosion by a trained individual. If erosion is evident, flow rates will be reduced. If erosion continues to occur, discharges will be terminated until appropriate erosion control measures are installed. Monitoring will be conducted just prior to the start of the discharge and regularly (i.e., every hour, every four hours, every eight hours) during the discharge. Monitoring frequency will depend on the nature of the discharge and the erosion in the area.
- An environmental monitor will walk along each discharge drainage to the termination of the drainage or 500 feet downstream to inspect for erosion after a draining is complete. If erosion is detected, reclamation measures will be taken to correct the erosion. Correction measures shall include recontouring the land to its previous state and revegetating with the appropriate native grass species in the area, if necessary.
- Discharge rates will be ramped up slowly such that the increase in flow rate in the receiving water is gradual and scouring of the channel bed and banks does not occur.
- Flows will be diverted around sensitive, actively eroding, or extremely steep areas to prevent erosion. Flow diversion methods might include use of flexible piping and/or placement of sandbags to alter flow direction, or equivalent measures. The new flow path and discharge point will be monitored for signs of erosion.
- Pipeline discharge for maintenance work would preferentially be performed during winter months, when storm events are more common and when water is naturally highest. Discharge flows are then a minimal portion of overall stream or river flow. If draining must occur during summer or fall, a slow release is mandatory to ensure receiving waters do not experience a substantial temperature change (greater than 2 degrees Fahrenheit).

6.4.4 Rural Projects

Rural projects include transportation projects, the South County Airport expansion, the Kirby Landfill expansion, construction of large new recreation facilities (e.g., golf course, sports fields, and extensive picnic areas), capital water supply projects, and private rural residential and commercial development. These rural projects have the potential to affect covered species by removing substantial areas of habitat, disrupting hydrologic patterns, contributing to habitat fragmentation, discharging sediment into water bodies, and resulting in direct mortality of covered species. Conditions 6 and 7 are designed to reduce the severity of such impacts for rural projects.

Condition 6. Design and Construction Requirements for Covered Transportation Projects

This condition identifies design requirements to minimize the impacts of transportation projects on wildlife movement, occurrences of certain covered species, and important habitat for covered species. All road and rail transportation projects (including the BART extension), or portions thereof, outside streams and within the planning limit of urban growth are exempt from this condition. Road projects in these areas are either within participating cities (i.e., urban areas) or within adjacent County jurisdiction, both of which support relatively dense suburban development. Road projects in these areas are not expected to significantly affect wildlife linkages, occurrences of covered species, or habitat for covered species. All covered transportation projects that cross streams or creeks, including bridges, are subject to Condition 4 above.

Four new road extensions/connections/realignments are proposed outside the planning limit of urban growth during the permit term of this Plan. However, many road improvements, including road widenings, are covered by the Plan (see **Table 2-6**). One new mass transit project is covered by the Plan: the double tracking of the Caltrain line from San José to Gilroy along the existing corridor.

Exempt Transportation Projects

The following projects are not subject to the design requirements or construction practices specified in this condition because they are not expected to result in new ground disturbance and are not expected to create new wildlife movement barriers or augment existing barriers.

- Installing traffic signals, signs, pavement markings, flashing beacons, or other safety warnings.
- Painting new lane striping.
- Installing “rumble” strips, channelizers, or other safety markers.
- Installing guardrails or similar structures that are permeable to wildlife.

- Installing ramp metering.
- Regrading existing shoulders (this activity is considered maintenance; see Condition 8).
- Implementing other road safety improvements on less than 1,000 feet of roadway.

All transportation projects that cross creeks are subject to Condition 4 above.

The following projects are also exempt from this condition, due to their small footprint, if the project does not include installation of median barriers or other impermeable safety barriers, and if no mapped or unmapped stream, riparian, serpentine, pond, or wetland land cover types are present, and if the activity is not located in a stream setback. Project lengths must be calculated based on the all new adjacent projects constructed since the time of Plan implementation to determine whether the below thresholds have been crossed.

- Widening roads to add lanes where the project is less than or equal to 1,000 feet in length.
- Realigning roads for safety or operational purposes where the project is less than or equal to 1,000 feet in length.
- Constructing new turn lanes less than or equal to 1,000 feet in length.
- Constructing a new road shoulder less than or equal to 1,000 feet in length.

Outside the planning limit of urban growth transportation projects will adopt design requirements and construction practices to minimize impacts on covered species, natural communities, and wildlife movement (see below). Depending on the type of project, these design requirements and construction practices would be *required* or *possible* (**Table 6-3**).

- **Required** (R). Design element or construction practice is required.
- **Possible** (P). Design element or construction practice is required unless field data collected at the site or in comparable areas demonstrate that the element or practice would not benefit wildlife, and CDFG and USFWS concur with the findings.

Types of Projects Subject to Condition

The following projects are subject to the design requirements or construction practices because they are expected to result in new ground disturbance, or they may create new wildlife movement barriers or augment existing barriers. Each project category is subject to a specific combination of requirements listed below and in **Table 6-3**.

Highway Projects

Highway projects are those VTA projects identified in **Table 2-6** as highway projects that call for the expansion of existing highways within the study area.

Mass Transit Projects

The single mass transit project identified for coverage in this Plan is the VTA project identified in **Table 2-6** as *Caltrain South County* which calls for the double tracking of the existing Caltrain corridor.

Roadway Projects and Interchange Upgrades

Major roadway projects and interchange upgrade projects (major roadway projects) are those projects identified in **Table 2-6**. All non-exempt Santa Clara County roadway projects and VTA interchange upgrades identified in **Table 2-6** are subject to the conditions identified **Table 6-3**.

Road Safety and Operational Improvements

These projects include the road projects described in Section 2.3.5 *Rural Capital Projects* that are not listed in **Table 2-6**. Road safety and operational improvements are expected to involve ground-disturbing activities but are not expected to impede or substantially worsen wildlife linkage. However, there may be opportunities for some projects to improve wildlife linkages. These projects are subject to construction and post-construction practices but not to project design requirements (**Table 6-3**).

Dirt Road Construction

Dirt roads may be constructed by the Permittees or private landowners to access their property. These projects are subject to construction and post-construction practices but not to project design requirements (**Table 6-3**).

Pre-Design Data Collection for Wildlife Movement

For transportation projects with the greatest potential to affect wildlife movement (see **Table 6-3** and lists above), it will be important to incorporate requirements that minimize the projects' adverse impacts on wildlife movement. In some cases, transportation projects may present opportunities to upgrade existing structures to improve wildlife movement. For these upgrades to be most effective, they will be supported by data describing movement of wildlife at or near the project site and the likelihood of vehicle collisions based on traffic patterns.

To facilitate better project design and to avoid delays in project construction due to the data collection process, the Implementing Entity will establish a long-term data collection program on wildlife movement in the study area. The primary goal of this program will be to determine the movement patterns of key covered species and other native wildlife throughout the study area. Data collection stations will be established at points along covered transportation projects that are most likely to affect wildlife movement. Wildlife movement will be studied at key sites to determine which species move through the area, when they move and, most importantly, which landscape features are most often used. Techniques used for data collection will vary by site and target species but may include remote cameras, wildlife track pads, and roadkill observations. This program is described in greater detail in Chapter 5. It is expected that several years (or decades) of data will be available to inform project design by the time that many of these projects reach the design stage. (This monitoring program is in addition to the wildlife corridor feasibility study discussed in Chapter 5.)

Data collection will be required on wildlife movement along the applicable project corridor for at least 1 year prior to project design. These data will be used to select the design requirements most appropriate for the species and conditions particular to the site (see below). If the Implementing Entity has not collected data in the project vicinity and the project timeline does not permit new data collection, then the applicant must apply all the design guidelines on the basis of the best available information for the region and appropriate to the conditions at the project site.

Transportation project applicants will coordinate with the Implementing Entity and Wildlife Agencies on applicable projects as indicated in **Table 6-3** during the conceptual design phase to ensure that as the project moves from conceptual to final design, the project meets the terms of this Plan.

When multiple road expansions are planned for a roadway during the permit term, wildlife crossing needs will be considered for each roadway as a whole, not by road segment. Further, design requirements will be considered for each wildlife species likely to cross the facility (Barnum 2003). These data will inform the design of wildlife movement structures suitable for the site and the species that use the area. In addition, after each project component is installed, wildlife activity along the road will be monitored to assess how wildlife responded to the project, if behavior has changed, and if additional design considerations will be utilized as future projects are implemented along the roadway.

Transportation Project Design Requirements

To reduce the impacts of construction activities on natural communities and native species within the study area, the design requirements listed below will be implemented for applicable transportation projects (**Table 6-3**). Design requirements are based on the latest techniques for minimizing impacts of transportation projects (Forman et al. 2002; Irwin et al. 2003; Finch 2004; Hilty et al. 2006). Some design requirements may be updated by the Implementing Entity if the best available science indicates that such updates would be more effective at facilitating safe wildlife movement across transportation corridors. Because the effectiveness of road crossings designed for wildlife is an active area of research, frequent advances in design are expected throughout the permit term.

- **Enhance existing undercrossings.** When road expansion projects span an undercrossing, such as a culvert, existing undercrossing structures will be enhanced within safety or engineering limitations to allow for fish and wildlife movement. Existing culverts or other potential crossing points will be enhanced if results of data collection indicate that the existing structure is inadequate. The design requirements of replacement structures will be determined by the species that have been documented using or attempting to use the site. Wildlife crossings that can serve multiple species will be used whenever possible.

- **Crossing enhancements.** Crossing enhancements must incorporate design requirements identified for culverts in Condition 4, *Stream Avoidance and Minimization for In-Stream Projects*.
- **Minimum sizing of culverts.** Culverts must be the minimum length, height, and width necessary to provide safe passage under the road for the target species present at the site (based on data collected as described above). Culvert designs will be based on the best available data at the time. Current recommendations are that culverts designed for medium-size mammals (e.g., San Joaquin kit fox, coyote, raccoon) be 5–8 feet in diameter (although culverts larger than 8 feet in diameter may be needed for longer crossings). Culverts designed for small mammals or amphibians are recommended at 18–48 inches in diameter. Culverts will provide a natural substrate on which wildlife can travel (e.g., open bottom box culvert) when such designs are compatible with the hydrologic needs of the culvert.
- **Install grating to allow ambient light to penetrate undercrossing.** Culverts will include grating on the inactive part of the roadbed (e.g., road shoulders or median) to allow filtration of ambient light and moisture but minimize noise intrusion. Artificial lighting inside tunnels or culverts will not be used; these devices have not been shown to be effective and may deter nocturnal wildlife. Such devices may also be vandalized.
- **Fencing design.** Fencing will be required in areas where high mortality rates of species attempting to cross the road occur. Fencing will be used along the perimeter of the roadway to direct animals to undercrossings and minimize their access to the road. Fencing designs will be tailored to the species expected to use the undercrossing and will be based on the best available data on species use and best fencing designs available at the time. For example, fencing for amphibians will be high enough to prevent amphibian crossing but low enough to allow movement of other species (e.g., deer, badgers, etc.). Fencing will extend out from the undercrossing along the road to an appropriate distance that will serve as a barrier to wildlife attempting to cross the road. The distance that fencing extends from the undercrossing will be determined on a case-by-case basis and will consider locations of known collisions in the area. Right-of-way fencing could be designed to serve this purpose. Fencing must be attached to the undercrossing to prevent wildlife from passing through a gap between the undercrossing and the beginning of the fence.

  Fencing must be monitored regularly by the facility owner and repairs made promptly to ensure effectiveness. Vegetation must be managed along small mammal and amphibian fencing to reduce the opportunity for these species to climb the fence. Fencing designed for small mammal or amphibian exclusion must be installed at least 8 inches into the soil to prevent small mammals from tunneling under the fence.

Where low-traffic side roads (e.g., ranch roads) cross the wildlife fences along the main roadway, gates will be used whenever possible to avoid creating a gap in the fence that wildlife could move through. The gate will be designed to minimize the gap between the gate and the roadbed. If gates are not feasible, an in-roadway barrier (e.g., wildlife grates) or device that channels species away must be installed to deter wildlife from moving around fences and into the road.

- **Passage placement.** New passages will only be placed or located in areas that connect two viable habitats so that wildlife is not directed into urbanized areas.
- **Road or rail barrier designs.** When compatible with vehicle and train safety, road and rail median barriers or shoulder barriers will allow wildlife to cross under or over the barrier in the event they become trapped in the right-of-way. For example, one-way gates could be used to allow movement out of the hazardous zone but not into it.

Construction Practices

The following construction practices apply to categories of transportation projects listed in **Table 6-3**.

Avoidance and Minimization Measures for Transportation Projects

- Minimize ground disturbance to the smallest area feasible.
- For construction of new dirt roads, prevent rills (a narrow groove or crack in the road resulting from erosion by overland flow) by breaking large or long bare areas up into smaller patches that can be effectively drained before rills can develop (Fishery Network of Central California Coastal Counties 2004).
- For construction of new dirt roads, disconnect and disperse runoff flow paths, including roadside ditches, which might otherwise deliver fine sediment to stream channels (Fishery Network of Central California Coastal Counties 2004).
- For construction of new dirt roads, prevent gullies by dispersing runoff from road surfaces, ditches and construction sites, by correctly designing, installing and maintaining drainage structures (e.g., road shape, rolling dips, out-sloped roads, culverts, etc.) and by keeping streams in their natural channels. No single point of discharge from a road or other disturbed area should carry sufficient flow to create gullies. If gullies continue to develop, additional drainage structures are needed to further disperse the runoff (Fishery Network of Central California Coastal Counties 2004).
- When constructing or reconstructing a ditch, utilize designs for outlet locations that avoid directly dumping ditch water into surface waters, when practical. If not practical, implement sediment management avoidance and minimization measures to trap sediment before it reaches a stream. Avoidance and minimization measures described in Condition 3 and

Condition 4 will be applied as appropriate (Fishery Network of Central California Coastal Counties 2004).

- When designing or redesigning roads, look for opportunities to restore natural drainage patterns. Install culverts or rolling dips to retain water in its drainage of origin, which will decrease the potential for erosion downstream. On problem roads, look for opportunities to reconstruct the road segment to improve and maintain natural drainage patterns; for example, add rolling dips, emergency water bars and additional cross drains (Fishery Network of Central California Coastal Counties 2004).
- When constructing dirt roads, install road surface and ditch drainage structures frequently enough so that gullies do not form at drainage points and so that the road and drainage system are generally dry (Fishery Network of Central California Coastal Counties 2004).
- Equipment storage, fueling, and staging areas will be sited on disturbed areas or on non-sensitive nonnative grassland land cover types, when these sites are available, to minimize risk of direct discharge into riparian areas or other sensitive land cover types. When such sites are not available, staging will occur on the road used to access the site.
- All species survey requirements of this Plan will be followed within the construction zone (i.e., the limit of project construction plus equipment staging areas and access roads) and the entire road right-of-way. Expanding the survey area beyond the project footprint will help identify covered species and their habitats so that impacts on covered species that occur adjacent to the construction zone can be minimized.
- No erodible materials will be deposited into watercourses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks.
- Silt fencing or other sediment trapping methods will be installed below the grade of new road construction or road widening activities to minimize the transport of sediment off site.
- Temporary barriers will be constructed to keep wildlife out of construction sites, as appropriate.
- Onsite monitoring will be conducted by a qualified biologist throughout the construction period to ensure that disturbance limits, avoidance and minimization measures, and Plan restrictions are being implemented properly.
- Use existing roads for access and disturbed area for staging as site constraints allow. Off-road travel will avoid sensitive communities such as wetlands and known occurrences of covered plants.
- Active construction areas will be watered regularly to minimize the impact of dust on adjacent vegetation and wildlife habitats, if warranted.
- Portions of the project that occur in streams (e.g., bridge or culvert construction) will comply with Condition 4.

Post-construction Practices

Following construction, the areas beyond road shoulders and inside the right-of-way will be returned to a pre-project or ecologically improved condition. These actions will likely be applied differently to each road project and will decrease the potential for the spread of nonnative species.

- Invasive plants within the project area and any construction staging areas will be removed to prevent the spread of these species into nearby or adjacent reserves.
- All disturbed soils will be revegetated with native plants and/or grasses or sterile nonnative species suitable for the altered soil conditions upon completion of construction. Local watershed native plants will be used if available. If sterile nonnative species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive nonnatives. All disturbed areas that have been compacted shall be de-compacted prior to planting or seeding.
- Vegetation and debris will be managed in and near culverts and under and near bridges to ensure that entryways remain open and visible to wildlife and that the passage through the culvert or under the bridge remains clear.

All structures constructed for wildlife movement (tunnels, culverts, underpasses, fences) will be monitored at regular intervals by the Local Partner facility owner and repairs made promptly to ensure that the structure is in proper condition. For facilities owned by entities not participating in the Habitat Plan (e.g., California Department of Transportation [Caltrans]), the Implementing Entity will secure access and data collection agreements with these entities to allow the Implementing Entity to conduct this monitoring.

Condition 7. Rural Development Design and Construction Requirements

For this Plan, rural development is defined as any new development that occurs outside of the urban service area at the time the development is permitted under the Plan, or those areas within the urban service area that are only covered for development consistent with rural land uses. The rural development covered activities listed below are subject to this condition and to the applicable permitting process of the local jurisdiction.

- Residential development (e.g., single family homes, subdivisions) consistent with the County General Plan (County of Santa Clara 1994). Ancillary improvements may include privately owned bridges, driveways, access roads, vineyards or orchards, and other accessory structures associated with rural dwelling units.
- Non-residential development consistent with the County General Plan (County of Santa Clara 1994). This includes new commercial facilities

(institutional, industrial) agricultural facilities (mushroom farms, commercial stables, and equestrian event facilities) or similar uses that obtain building, grading and/or other development permits, consistent with local general plans, such.

- Vineyard, orchard, or other farming activity that obtains a building, grading, or development permit from the County or City.
- Residential or non-residential development on the non-urban hillsides of eastern San José (outside the planning limit of urban growth) and in the Coyote Valley Urban Reserve and South Almaden Valley Urban Reserve consistent with the San José General Plan.
- Residential or non-residential development in the Morgan Hill Southeast Quadrant consistent with the Morgan Hill General Plan.
- Residential or non-residential development in the Hecker Pass Specific Plan area consistent with the Gilroy General Plan.
- Projects, including capital projects, implemented by Permittees outside the urban service area.

As described in Chapter 4, rural development in hillside and natural areas that will remain rural has a greater potential for direct and indirect impacts on sensitive habitat and more covered species than urban development in already developed areas for a number of reasons. First, rural development tends to occur on larger parcels or in less constrained sites, affecting larger areas. Second, the existing landscape in hillside and natural areas is generally less disturbed prior to project construction on rural development sites than on urban sites. Third, rural development tends to occur near or in areas with native vegetation and higher biological values, including areas near or adjacent to the Reserve System. Rural development in natural areas tends to increase habitat fragmentation, which degrades or disrupts landscape connectivity. New driveways and roads associated with rural development may create new hazards or barriers to species dispersal. Indirect impacts also occur at both the development site and the landscape level, as rural development can introduce new sources of noise, light and glare, air pollution, and vehicle traffic in more remote areas. Despite the potential for these adverse effects on natural communities and covered species, rural development projects often have greater flexibility to modify designs to reduce or minimize impacts on covered species and natural communities than projects in urban areas.

As described in Chapter 4, existing land use restrictions and requirements also substantially limit the footprint and extent of rural development. For example, almost all of the areas intended to be incorporated into the Reserve System (see Chapter 5) are large land holdings designated as Hillside or Ranchland land uses under the County General Plan. In these areas, the maximum development density allowed is one residence per 20 to 160 acres, based on the average slope of a parcel. Subdivision of sites designated Hillside or Ranchland seldom occurs and this pattern is not expected to change during the permit term due to the physical challenges of development in most of the study area. Under County policies, most subdivision proposals for Hillside parcels are required to cluster future development and preserve a minimum of 90% of the site as open space. If suitable, these large set-asides could be incorporated into the Reserve System. County policies and regulations also require that grading be minimized in Hillside and Ranchland areas through the site design process, which emphasizes compact development. These land-use restrictions help to minimize the effects of rural development on covered species and natural communities.

The primary goal of this condition is to minimize the potential direct and indirect impacts of rural development in areas that will remain primarily rural on covered species and natural communities most likely to be affected by rural development (see Chapter 4, including **Table 4-1**, for an accounting of which species could be affected by rural development). Additional goals of this condition are listed below.

- Minimize habitat fragmentation and degradation of landscape linkages (e.g., wildlife corridors), including maintaining connectivity between aquatic, riparian, and upland habitats.
- Minimize loss of sensitive land cover types and natural communities including but not limited to riparian woodlands, seasonal wetlands, freshwater marsh, ponds, serpentine grassland, valley oak woodland, knobcone pine woodland, and ponderosa pine woodland.
- Reduce the extent of new roads in remote rural areas in order to reduce negative impacts on species.
- Minimize degradation of streams and maintain the hydrograph to the baseline (defined as the existing conditions at the time of Plan approval), or adjust the hydrograph toward predevelopment conditions[11].
- Minimize construction-related impacts, including noise; air emissions; erosion and sedimentation; disturbance of native vegetation; and introduction of nonnative, invasive species.
- When designing or retrofitting County facilities, evaluate whether the project can be designed to reduce impervious surfaces to less than pre-project conditions.

This condition integrates existing County requirements with additional avoidance and minimization measures that are intended to reinforce current regulations and support the goals of this condition. The design requirements and conditions for all rural development covered by the Plan are listed below and will be applied as applicable.

Design and Construction Requirements

Projects subject to this condition are required to follow the following measures.

[11] The hydrograph will be monitored using existing stream gages within the study area, new gages proposed under the plan, and could be monitored at large developments occurring during the Permit Term, as deemed appropriate by the Implementing Entity.

- Plans presented to local jurisdiction planning staff by private applicants for discretionary approval or a building permit process must identify the proposed impact area and general location of site design features (e.g., residence, access road, leach field, wells, vineyards, accessory structures, etc.). The site plan will show all improvements that will result in permanent land cover impacts (e.g., home, driveway, barn, pool, patio, landscaping, and utilities, etc.), including a 50-foot buffer around all proposed site improvements. The project area plus the 50-foot buffer is called the *development area*. This site plan will also show all site improvements that will result in temporary land cover impacts during construction but that will be returned to the pre-project land cover type within 1 year of completing construction (e.g., leach fields, well pipelines that do not result in permanent habitat disturbance), including a 10-foot buffer around the proposed footprint of the site improvements. Plans do not need to show buffer areas (50 feet for permanent improvements and 10 feet for temporary improvements) that cross property boundaries (e.g., a house 30 feet from a property line only needs to show the buffer area up to the property line). **Figure 6-1** provides an example map of the information required on the site plan. (**Figure 6-1** also defines the development area for the purposes of determining survey areas [see Section 6.8.5 *Item 5: Results of Applicable Species Surveys and Monitoring*] and calculating development fees [see Chapter 9, Section 9.4.1 *Habitat Plan Fees*]).
- Minimize ground disturbance to the smallest area feasible.
- Build close to, and utilize to the extent practicable, existing infrastructure (e.g., existing driveways, utility lines).
- Use existing roads for access and disturbed areas for staging as site constraints allow. Off-road travel will avoid sensitive communities such as wetlands and known occurrences of covered plants.
- Adhere to Condition 10, *Fuel Buffer*.

Site Hydrology

- Develop only the minimum number of stream crossings necessary to access the property.
- At project sites that are adjacent to any drainage, natural or manmade, exposed soils must be stabilized or otherwise contained on site to prevent excessive sediment from entering a waterway.
- Use of impermeable surfaces surrounding structures must be minimized to the greatest extent possible through the use of alternative design treatments, such as low impact development methods, including but not limited to, permeable pavers, green roofs, and rainwater catchments so that natural infiltration is facilitated and runoff is reduced.
- Consistent with State and Regional Water Quality Control Board regulations, runoff from impermeable surfaces must be directed to natural or landscaped areas, or to designed swales or detention/retention basins to encourage

natural filtration and infiltration. Diversion to a cistern or other onsite stormwater management technique is also allowed and encouraged.

- Avoid and minimize impacts associated with altering natural drainages and contours on the project site. If the site is graded, blend grading into the existing landform as much as possible.
- Leach fields must be sited away from creeks in accordance with the County septic ordinances, as well as at least 100 feet from the reserve boundary. Leach field installation may result in localized soil moisture content and groundwater levels that may have adverse effects on sensitive plants or plant communities in the Reserve System. Leach fields may be sited within the 100-foot setback if site-specific conditions (i.e., topography) adequately minimize effects, or adequate space is not available to site the field elsewhere (i.e., the parcel is too small).
- Adhere to Condition 3, *Maintain Hydrologic Conditions and Protect Water Quality*.
- Adhere to Condition 4, *Stream Avoidance and Minimization for In-Stream Projects*.
- Adhere to Condition 5, *Avoidance and Minimization Measures for In-Stream Operations and Maintenance*.
- Adhere to Condition 11, *Stream and Riparian Setbacks*.

Vineyards

The following conditions apply to new vineyards that are covered by the Habitat Plan (i.e., those requiring a permit from the County or other local jurisdiction) and are encouraged for new and existing vineyards that do not require a development permit.

- During construction, use cover crops, straw mulch, straw wattles/fiber rolls, coconut husks, or other equivalent erosion control mechanism to prevent sediment from being blown or washed from the project site.
- All disturbed areas will be protected during the rainy season (October 15–April 15). Permanent or temporary measures to prevent erosion must be utilized during vineyard planting. Permanent measures must be utilized once planting is completed. Erosion control measures must be in place by October 15.
- Plant vine rows along existing contours to slow runoff and reduce erosion on hillsides (California Sustainable Wine Growing Alliance 2002a).
- A stormwater management system designed for an average storm recurrence interval of not less than 25 years will be installed on the vineyard site. The system will allow excess stormwater runoff to be carried through the vineyard site with minimum erosion and consistent with the overall drainage patterns present in the area. This requirement may be met by either temporary or permanent measures while vineyard planting work is being

carried out, but shall be met by permanent measures by the time vineyard planting work is completed.

- A sediment control system designed to minimize the discharge of sediment from the vineyard site will be installed on the vineyard site. This requirement may be met by either temporary or permanent measures while vineyard planting work is being carried out, but will be met by permanent measures by the time vineyard planting work is completed.
- If open conduits are used as part of the stormwater management system, plant conduits with grasses and other vegetation to filter sediment, pesticides, and fertilizers from runoff and to reduce the potential that the stormwater conduit itself will erode.
- As part of the stormwater and sediment management systems, install vegetated swales, detention basins, extended vegetated buffer, or other similar feature on the downslope edge of the planted area to capture and treat runoff before it enters local streams. This will minimize the amount of sediment, fertilizers, and pesticides that enter local streams.
- Heavy equipment will not be utilized on dirt access roads immediately after rain to prevent roads from turning to mud and sediment from running off the roads (California Sustainable Wine Growing Alliance 2002a).
- Use of natural pest management approaches in place of pesticides is highly encouraged.
- Maintain a buffer of natural vegetation, including grasses, shrubs, or mature trees, around the perimeter of the vineyard to reduce topsoil erosion and provide habitat for birds that will prey on rodents (California Sustainable Wine Growing Alliance 2006).

Private Rural Roads

- Minimize to the maximum extent possible the amount of ground disturbance when constructing roads.
- Ground-disturbing activities associated with road construction should be timed to occur during dry weather months to reduce the possibility of landslides or other sediment being transported to local streams during wet weather.
- If construction extends into wet weather, the road bed will be surfaced with appropriate surfacing material to prevent erosion of the exposed roadbed (Pacific Watershed Associates 1994).
- Avoid, to the extent possible, constructing roads on steep slopes (over 25%) or on unstable slopes.
- If construction on steep slopes is required, construction will be timed for dry weather months to reduce the potential for landslides.
- Adhere to the avoidance and minimization measures for dirt road construction in Condition 6 under *Avoidance and Minimization Measures for Transportation Projects* (see first three bullets under heading).

Other Requirements

- Maintain as much natural vegetation as possible, consistent with fuel management standards, on the project site.
- Maintain County-mandated fuel buffer (variable width by slope conditions).
- On sites adjacent to reserves, locate the proposed development as far from the reserve boundary as possible consistent with other onsite conditions and constraints and adhere to Condition 2, *Incorporate Urban-Wildland Interface Design Elements*.
- All temporarily disturbed soils will be revegetated with native plants and/or grasses or sterile nonnative species suitable for the altered soil conditions upon completion of construction. Local watershed native plants will be used if available. If sterile nonnative species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive nonnatives. All disturbed areas that have been compacted shall be de-compacted prior to planting or seeding.
- All temporarily disturbed areas, such as staging areas, will be returned to pre-project or ecologically improved conditions within 1 year of completing construction or the impact will be considered permanent.
- No plants identified by the California Invasive Plant Council as invasive[12] will be planted on the project site. Planting with watershed local native and/or drought-resistant plants is highly encouraged. This reduces the need for watering as well as the need for fertilizers and pesticides.
- Outdoor lighting will be of low intensity and will utilize full cutoff fixtures to reduce light pollution of the surrounding natural areas.

Project proponents must continue to adhere to all applicable local planning ordinances including: noise ordinances, zoning ordinances, fuel management guidelines for fire buffers, NPDES permit requirements, Water Collaborative guidelines and standards, Santa Clara County grading ordinance, and drainage manual.

6.4.5 Rural Operations and Maintenance

Rural operations and maintenance activities—such as operations and maintenance of utility lines and facilities, road maintenance, vegetation management, and mitigation monitoring—have the potential to affect covered species by disturbing nesting covered bird species, leading to sediment discharge, and spreading of nonnative invasive species. Condition 8 would reduce the severity of such impacts.

[12] See <www.cal-ipc.org/ip/inventory> for the latest list of invasive species.

Condition 8. Implement Avoidance and Minimization Measures for Rural Road Maintenance

Road maintenance activities have the potential to directly affect covered species through management activities such as mowing, and may indirectly affect covered species by introducing sediment and other pollutants into downstream waterways and by spreading invasive weeds. Effects on covered species may be greatest on unpaved roads due to their erosion potential. The County maintains an extensive network of paved and unpaved roads. All roads maintained by the County Roads and Airports Department in the study area are paved, except for a portion of one road[13]. County Parks maintains an extensive network of unpaved maintenance and emergency access roads within their parks that often serve primarily as recreational trails. SCVWD maintains a small network of paved and unpaved roads, mostly on levees and along pipelines. Gilroy and Morgan Hill do not maintain any dirt roads outside of the planning limit of urban growth.

To avoid and minimize these impacts, avoidance and minimization measures were developed to address potential impacts associated with road operation and maintenance activities. The avoidance and minimization measures in this condition are based largely on the guidelines in *County Road Maintenance Guidelines for Protecting Aquatic Habitat and Salmon Fisheries* (Fishery Network of Central California Coastal Counties 2004). This manual, also called FishNet 4C, was developed by six central California counties (Mendocino, Sonoma, Marin, San Mateo, Santa Cruz and Monterey counties) and included input from cities, local Resource Conservation Districts, and water agencies. This manual identifies best management practices to protect water quality and aquatic habitat when implementing routine and emergency road maintenance activities. These guidelines incorporate avoidance and minimization measures from other road maintenance programs (e.g., the Oregon State Department of Transportation's *Road Maintenance Manual*, and the Northern Five Counties Salmon Conservation Group's *A Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds*) (Fishery Network of Central California Coastal Counties 2004). Avoidance and minimization measures identified in the FishNet 4C guidelines are included in **Table 6-4** as part of this condition. In addition to the avoidance and minimization measures in **Table 6-4**, project proponents will comply with the avoidance and minimization measures listed below. Avoidance and minimization measures identified in this condition will be used for all covered road operation and maintenance activities.

- Projects occurring in streams or riparian setback zone will also comply with Condition 4 and Condition 5 as appropriate.
- Minimize ground disturbance to the smallest area feasible.
- Within the riparian setback zone (see Condition 11), silt fencing or other sediment control device will be installed downslope from maintenance

[13] The one unpaved road maintained by County Roads and Airports in the study area is 1.75 miles of Mount Madonna Road between Redwood Retreat Road and Summit Road (the county line).

activities that disturb soil (e.g., blading of fire or access roads within Parks or the Reserve System) to minimize the transport of sediment off site.

- In the course of rural road maintenance, no erodible materials will be deposited into watercourses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks where it could be washed into the channel.
- Alternatives such as mechanical control will be considered to substantially lessen any significant impact on the environment before using pesticides. Integrated pest management avoidance and minimization measures will be used for all vegetation control. Limitations may occur due to fire management requirements and local integrated pest management ordinances.
- The effects of herbicide and pesticide application will not be covered under the federal permits for this Plan. Herbicides and pesticides will be used only when necessary and will be applied in strict compliance with label requirements and state, federal, and local regulations. Herbicides and pesticides will only be applied when weather conditions will minimize drift and impacts on non-target sites.
- Maintenance activities on rural roads adjacent to natural land cover types will be seasonally timed, when safety permits and regulatory restrictions allow, to avoid or minimize adverse effects on active nests of resident and migratory birds, including covered bird species (western burrowing owl, least Bell's vireo, and tricolored blackbird). This measure is particularly relevant for right-of-way mowing[14], brush clearing, prevention of disease spread (i.e., sudden oak disease), and tree trimming. Project proponents will coordinate with the Implementing Entity to develop work schedules that optimize logistic, safety, and financial needs while minimizing potential impacts on nesting birds.
- Mowing equipment will be thoroughly cleaned before use in rural areas so they are free of noxious weeds (e.g., yellow star-thistle) and do not introduce such weeds to new areas.
- Maintenance or repair of road medians or shoulder barriers in areas that support natural land cover types (e.g., annual grassland, oak savanna, oak woodland) will not reduce the ability of wildlife of all types to move through or over them, within safety limits. Replacement or repair of road medians will be designed or installed to allow wildlife to move past these structures. Exceptions may be made by the Permittee if significant safety concerns or financial constraints arise.
- All disturbed soils will be revegetated with native plants and/or grasses or sterile nonnative species suitable for the altered soil conditions upon completion of construction. Local watershed native plants will be used if available. If sterile nonnative species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-

[14] For example, County Parks has a Memorandum of Understanding with the California Department of Forestry and Fire Protection (Cal-Fire) that limits mowing to November to April to minimize fire hazards. There may be other public safety restrictions that limit the ability to achieve this guideline.

term erosion control and slow colonization by invasive nonnatives. All disturbed areas that have been compacted shall be de-compacted prior to planting or seeding.

- Ground-disturbing road maintenance activities, such as regrading, will be timed so that the moisture content of the soil will support recompaction of the soil and reduce the need for an imported water source to achieve soil compaction. Similarly, activities will be timed so that use of heavy equipment will not result in the creation of mud puddles and ruts.
- Regularly scheduled visual inspections of all roads will be conducted to identify sites where erosion is contributing sediment to local streams. Appropriate actions will be taken within the road right-of-way to manage the erosion.
- Flow lines (e.g., culverts and ditches) will be cleared annually to maintain flow lines free of debris.
- Use existing roads for access and disturbed area for staging as site constraints allow. Off-road travel will avoid sensitive communities such as wetlands and known occurrences of covered plants.
- All new public roads that are accessible to general public vehicular use will be paved (this does not include fire roads that may also serve recreational needs).

6.4.6 Reserve System Implementation

Reserve System implementation—which includes activities associated with recreation, construction, infrastructure design, and maintenance of the reserves—could result in localized effects on covered species and their habitats. All relevant conditions will be applied to construction and maintenance activities within the Reserve System.

Condition 9. Prepare and Implement a Recreation Plan

Public access, consistent with the Habitat Plan conservation strategy, will be provided on all reserves owned in fee title by a public agency. Public access to privately owned land under conservation easement will only be permitted with the landowner’s consent. See Chapter 10 *Assurances* for more details.

All public access to reserves will be managed according to a recreation plan that will be developed by the landowner (e.g., County Parks, Open Space Authority) and/or the Implementing Entity consistent with the requirements of this condition. Recreation plans will be reviewed by the Implementing Entity for consistency with this condition and integrated into the applicable reserve unit management plan which will be reviewed and approved by the Permittees and the Wildlife Agencies. Wildlife Agency approval of reserve unit management plans will follow the timelines established in Chapter 5, Section 5.2.5 *Land Management* subheading *Land Management on Reserves*.

The recreation plan will address lands that are acquired for or incorporated into a reserve unit where the Implementing Entity and the land owner determine that recreational and educational uses are compatible with the conservation strategy of this Plan. Each recreation plan will apply to the portion of the reserve unit for which the recreation plan was developed, including existing open space that is incorporated into the unit (existing open space selected for the Reserve System was chosen, in part, for its recreational uses that are compatible with the biological goals and objectives of the Plan).

At a minimum, each recreation plan will contain the requirements listed below.

- Identification of sites within reserves where recreational use is compatible with the goals and objectives of the Plan.
- Identification of acceptable forms of recreation if different from those forms identified in this condition.
- Identification of sites within reserves that contain sensitive land cover types or suitable or occupied habitat for covered species.
- Maps of existing and proposed recreational trails, staging areas, and facilities and of habitat types affected.
- Site-specific methods of recreational use controls.
- Trail and use monitoring methods, schedules, and responsibilities.
- Trail operation and maintenance guidelines and responsibilities. This includes control of active off-trail recreational activities determined inappropriate by Implementing Entity and Wildlife Agencies.
- A framework for enforcement of recreational restrictions and permitting process for restricted recreational uses.
- An evaluation determining if the impact of planned recreational use is within the limits established in the Plan and EIS/EIR, and if planned recreation is compatible with the biological goals and objectives of the Plan.
- Clear triggers for use restrictions or closure based on sensitive biological indicators (e.g., seasonal closures of some trails on the basis of activity periods of covered or sensitive species).

Land acquired for reserves will be closed to all recreational uses until a recreation plan is developed and approved as part of a reserve unit management plan. Existing recreational uses on land incorporated into the Reserve System from existing open space (e.g., County Parks) will continue until the reserve unit management plan and associated recreation plan is completed. Existing open space selected for the Reserve System was chosen, in part, because of its compatible recreation uses with the conservation strategy (see **Table 5-5** and **Figure 5-4**). Until the reserve unit management plan is completed, no additional recreational uses beyond what is currently allowed will occur on that existing open space incorporated into the Reserve System.

Recreational uses in the Reserve System will be designed to minimize impacts on biological resources and must adhere to the requirements and guidelines listed below.

- Recreation will only be allowed where it is compatible with the biological goals and objectives of the Plan and has less-than-significant impacts on biological resources after implementation of necessary mitigation measures, as described in the EIR/EIS.
- Recreational use and impacts will be monitored by the landowner and the Implementing Entity to ensure that uses do not substantially and adversely affect covered species. If any use is found to be substantially adversely affecting covered species, that use will be discontinued until adjustments in the use can be made to reduce or eliminate impacts (see Chapter 7 for details on monitoring). The Implementing Entity will make decisions about discontinuing or modifying recreational uses in close consultation with the landowner or other applicable reserve management agency or organization, and through a public process.
- Recreational uses allowed in reserves include pedestrian use (walking, hiking, running), dogs on leash, backpacking, nonmotorized bicycle riding on designated trails, horseback riding, wildlife observation and photography, and environmental education and interpretation on designated trails at appropriate sites. Other uses may be allowed by the Implementing Entity as long as they are compatible with the biological goals and objectives of the Plan and users obtain appropriate permissions for conducting activities if needed (e.g., County Parks requires a permit for professional photography).
- Allowable recreational uses will be controlled and restricted by area and time to minimize impacts on natural communities and covered species and to ensure that the biological goals and objectives of the Plan are met. For example, trails will be closed during and immediately following heavy rains and annually winterized to minimize erosion and sedimentation. Additional types of recreational uses (e.g., horse carts on trails) may be allowed if the Implementing Entity determines that they are consistent with the biological goals and objectives of the Plan, CDFG and USFWS concur, and users obtain appropriate permissions for conducting activities if needed (e.g., County Parks requires a permit for use of horse carts).
- Activities will be allowed in keeping with the ecological needs of the given habitat. Any off trail activities and other active recreation not listed above (e.g., outdoor sports, geocaching) unless otherwise authorized by the Implementing Entity are prohibited. Recreational uses will be allowed only during daylight hours and designated times of the year (i.e., limited seasonal closures to protect sensitive covered species; see below for specific examples) unless authorized through a use permit (i.e., backpacking). Exceptions may be made for educational groups and events that are guided by an Implementing Entity staff person or docent approved by the Implementing Entity.

- New staging areas will be developed to the extent possible in areas within reserves that are already disturbed and not suitable for habitat restoration, and that do not contribute to the conservation biological objectives for covered species habitats and/or natural communities. Sites at the edges of reserves will be chosen over sites on the interior of reserves.
- No motorized vehicles or boats will be allowed in reserves, except for use by the reserve manager staff or with the prior approval of the reserve manager (e.g., contractors implementing Plan conservation actions such as habitat restoration and monitoring, grazing tenants, fire-suppression personnel, and maintenance contractors). For reserves under conservation easements, vehicle use will be allowed as part of the regular use of the land (e.g., agricultural operations, permanent residents, utilities, police and fire departments, other easement holders), as specified in the easement.
- When compatible with Plan biological goals and objectives, dogs may be allowed in daylight hours in designated reserves or in designated areas of reserves, but only on leash. Leash law restrictions will be strictly enforced by reserve managers and staff because of the potential impact of dogs on covered species such as San Joaquin kit fox, western burrowing owl, California red-legged frog, and California tiger salamander. Leash enforcement may include citations and fines. Dogs used for herding purposes by grazing lessees must be under verbal control and have proof of vaccination.
- Recreational hunting or fishing within reserves will be prohibited except in limited circumstances. Landowners who have hunted large game (e.g., deer, elk, turkey, or pigs) on their property that becomes part of the Reserve System through a conservation easement will be allowed to continue this use as long as it is consistent with the biological goals and objectives of the Plan. Similarly, hunting for management purposes (e.g., feral pigs) is encouraged where it will contribute to achieving the goals and objectives of the Plan. The Implementing Entity will develop management hunting protocols on new reserve lands in coordination with other agencies who utilize hunting for management purposes (e.g., CDFG). Fishing is currently allowed in some County parks that will be added to the Reserve System. To be consistent with this condition, lakes or ponds in which fishing will continue will not be included in the Reserve System.
- Picnic areas shall be operated during daylight hours only. No irrigated turf or landscaping shall be allowed in picnic areas. To the extent feasible, picnic areas will be located on the perimeter of preserve areas and will be sited in already disturbed areas. No private vehicles shall be allowed in picnic areas, unless the picnic area is at a staging area and except for limited special events approved by the Implementing Entity. Maintenance and emergency vehicles shall be permitted access to picnic areas.
- Backpack camps shall be limited to use by no more than 25 people at each site. With the exception of Americans with Disabilities Act (ADA) service animals, dogs shall only be allowed in backpack camps on-leash. In coordination with the reserve manager, the Implementing Entity will monitor

use and maintenance of backpack camps and may implement a reservation and permitting process for use of backpack camps.

- Public collecting of native species will be prohibited within reserves.
- Introduction of domestic or feral animals, including cats, ducks, fish, reptiles, and any exotic non-naturalized species, is prohibited within the reserves to prevent interference with and mortality of native species, except by the reserve manager for management purposes (e.g., livestock for grazing or dogs for livestock control or protection).
- Trails will be established on existing roads or trails wherever possible to minimize the need for new ground-disturbing activities and to reduce new and ongoing maintenance costs. However, this will be balanced with the need to reroute some poorly designed existing ranch roads that are difficult and expensive to maintain. In some cases, rerouting access roads may have net benefits on biological resources.
- New trails will be designed and operated to be compatible with natural resources protection. New trails will be sited to minimize impacts on sensitive species (including covered species) and natural communities as well as disturbance to adjacent landowners and land uses. Wetlands will be avoided except for educational trails, and trails through woodland or riparian habitat will avoid tree removal or substantial pruning to the extent possible. If tree removal is required, unhealthy, exotic tree species, or trees unlikely to reach maturity due to site conditions (e.g., being shaded out by larger trees) will be targeted for removal.
- Trails built across streams or through riparian corridors will be sited and designed with the smallest footprint necessary to cross the in-stream area. Stream crossings will be perpendicular to the channel and be designed to avoid any potential for future erosion. Trails that follow a stream course will be sited outside the riparian corridor to the maximum extent feasible.
- Trails will not be paved, except as required by law, and will be sited and designed so that they do not contribute to erosion and bank failure. To provide trail access for a range of user capabilities and needs (including persons with physical limitations) in a manner consistent with state and federal regulations, the landowner would site and design new, paved trails in areas within reserves that are already disturbed and do not have the potential to affect sensitive habitat. As common practice, these types of whole-access trails would be sited near staging areas.
- Recreational uses will be controlled using a variety of techniques including fences, gates, clearly signed trails, educational kiosks, trail maps and brochures, interpretive programs, and patrol by land management staff.
- Construction of recreational facilities within reserves will be limited to those structures necessary to directly support the authorized recreational use of the reserve. Existing facilities will be used where possible. Facilities that support recreation and that may be compatible with the reserve include parking lots (e.g., small gravel or paved lots), trails (unpaved or paved as required by law), educational and informational kiosks, up to one visitor

center located in a disturbed or non-sensitive area, and restroom facilities located and designed to have minimal impacts on habitat. Playgrounds, irrigated turf, off-highway vehicle trails, and other facilities that are incompatible with the goals and objectives of this Plan will not be constructed.

- Signs and informational kiosks will be installed to inform recreational users of the sensitivity of the resources in the reserve, the need to stay on designated trails, and the danger to biological resources of introducing wildlife or plants into the reserve.
- New trails will be prohibited within 100 feet of wetlands and streams that provide suitable habitat for covered amphibians and aquatic reptiles or tricolored blackbird, unless topography or other landscape characteristics shield these trails from the covered species habitat or a lack of effect of the trail on the species can be otherwise demonstrated.
- New trails will be prohibited within 250 feet of active western burrowing owl nests. If an owl pair nests within 250 feet of an active trail, Implementing Entity staff will consult with the Wildlife Agencies to determine the appropriate action to take. Actions may include prohibiting trail use until young have fledged and are no longer dependant on the nest.
- When compatible with Plan biological goals and objectives, recreation plans for reserves adjacent to existing public lands will try to ensure consistency in recreational uses across open space boundaries to minimize confusion in the public. Reserves adjacent to non-Plan public lands with different recreational uses will provide clear signage to explain these differences to users that cross boundary lines. The Implementing Entity will be responsible for securing and signing reserve boundaries.

Rare exceptions to the guidelines listed above will be considered and approved by the Implementing Entity and the Wildlife Agencies on a case-by-case basis. Exceptions will be approved only if they are consistent with the biological goals and objectives of the Plan. Any exceptions will be clearly identified in the recreation plan.

Condition 10. Fuel Buffer

In accordance with state law[15], all applicable covered activities will remove all brush, flammable vegetation, or combustible growth within at least 30 feet and up to 100 feet of occupied dwellings or structures. The amount of fuel modification necessary shall take into account the flammability of the structure as affected by building material, building standards, location, slope, and type of vegetation. Fuels will be maintained in a condition so that a wildfire burning under average weather conditions would be unlikely to ignite the structure. The intensity of fuels management may vary within the 100-foot buffer of the structure, the most intense being within the first 30 feet around the structure.

[15] California Government Code Section 51182 and Public Resources Code 4291.

Consistent with fuels management objectives, steps will be taken to minimize erosion consistent with Condition 7.

Applicable covered activities include construction of new structures in the Diablo Range or Santa Cruz Mountains, or new structures built in grassland, chaparral, oak woodland, or conifer woodland land cover types. This condition also applies to structures built in areas designated by the County as a very high fire hazard severity zone pursuant to Section 51179 of the California Government Code.

If the property line is less than 30 feet from the occupied structure, then the brush and vegetation will be cleared up to the property line in order to maintain compliance with Public Resources Code 4291. Additional brush and vegetation clearing may be required by local or other state laws. To ensure that erosion is minimized, grass and other vegetation within 30 feet of structures will be maintained within this fuel buffer to a height of 18 inches or less. The cost of establishing and maintaining this fuel buffer will be borne by the project proponent. This condition does not apply to single trees or other vegetation that is well-pruned and maintained so as to effectively manage fuels and not form a means of rapidly transmitting fire from other nearby vegetation to a dwelling or structure.

The vast majority of properties adjacent to the Reserve System are expected to be able to create sufficient defensible space within their property to meet this condition. If an additional buffer is deemed necessary by the responsible fire agency, then the private landowner may seek an encroachment permit from the Implementing Entity to meet fire code. In these limited instances, the Implementing Entity may decide to allow a fuel buffer on the reserve side of a property boundary to provide additional protection against wildland fire. The Implementing Entity or land manager would define the allowable activities in encroachment permit to ensure compliance with HCP goals. If this is applied, the fuel management buffer within the reserve will not be credited to the land acquisition requirements in Chapter 5 because this area will be maintained in a disturbed state.

In areas within the Reserve System where management of fuel loads is necessary, the Implementing Entity will trim, mow, conduct prescribed burns, utilize grazing, or otherwise clear vegetation to minimize fuel loads and fire hazards. Various land uses are allowable within the fuel management buffer as long as they reduce fire hazards. Uses such as trails, fire-resistant landscaping, and livestock grazing are compatible with the fuel buffer. Allowable uses must comply with the urban-Reserve System interface guidelines described above.

Creating and maintaining the fuel management buffer within the Reserve System may have impacts on covered species. For example, plants such as Santa Clara Valley dudleya and smooth lessingia may occur in grasslands within fuel buffers. Any impacts on covered plants from fuel buffer management will be counted by the Implementing Entity as an adverse effect that must be offset by conservation of covered plants in the Reserve System (see Chapter 5). In some cases, maintenance of the fuel buffer may improve habitat for covered plants by reducing cover of nonnative plants.

6.5 Conditions to Minimize Impacts on Natural Communities

Conditions 11–14, described below, are designed to minimize impacts on natural communities identified as representing important ecosystems in the Plan area.

Condition 11. Stream and Riparian Setbacks

This condition applies to all covered activities that may impact streams. This includes all development inside the urban service area where a stream or the stream setback overlaps any portion of the parcel on which a covered activity is being implemented. Outside the urban service area, this includes all covered activities where a stream or stream setback overlaps any portion of the development area or project footprint. Exemptions and exceptions may apply as described below in this condition.

Background

The management of stream corridors and associated riparian habitat through the implementation of setbacks has become an increasingly important tool for conserving aquatic and semi-aquatic populations and riparian vegetation and improving water quality. There is strong evidence that riparian buffers of sufficient width protect and improve water quality by intercepting non-point source pollutants in surface and shallow subsurface water flow (e.g., Lowrance et al. 1984; Castelle et al. 1994).

Healthy riparian buffers are also widely recognized for their ability to perform a variety of physical and biological functions other than improving water quality. These functions include stabilizing stream channels; controlling erosion by regulating sediment storage, transport, and distribution; providing organic matter (e.g., leaves and large woody debris) that is critical for aquatic organisms; storing nutrients for the surrounding watershed; reducing water temperature through shading; minimizing flood peaks; and serving as key recharge points for renewing groundwater supplies (DeBano and Schmidt 1989; O'Laughlin and Belt 1995). Riparian buffers also provide habitat for a large variety of plant and animal species. Riparian buffers have been proposed, and in some cases proven, to be landscape components that promote wildlife movement, enhance gene flow, increase connectivity of isolated habitat patches, and provide breeding and foraging habitats for animals (Hilty et al. 2006; Rosenberg et al. 1997).

Within the study area, streams provide important breeding, foraging, and movement habitat for California red-legged frog, foothill yellow-legged frog, and western pond turtle. Riparian woodland, which is found next to many of the study area's streams, provides breeding sites for tricolored blackbird and least Bell's vireo. Riparian woodland habitat also protects water quality by filtering inflow, thus reducing pollutant input and sediment load. Finally, stream and riparian areas provide key linkages connecting conservation areas targeted under the Habitat Plan (see **Table 5-9** and **Figure 5-6**).

Because of the importance of streams and associated riparian woodland for the benefit of covered species and as sensitive land cover types addressed by this Plan, this condition was developed to be as protective as feasible within the land-use constraints of the local jurisdictions and financial constraints of the Habitat Plan. The following principles were developed to guide the stream and riparian setback condition for this Plan.

- Stream habitat and functions are very difficult to replace once lost; in some cases they cannot be replaced.
- Stream setbacks will be required for all covered activities occurring near streams and riparian areas to minimize effects on covered species as required under the ESA and NCCPA. Additional protections adjacent to streams may also be required for urban redevelopment projects.
- Each of the cities participating in the Habitat Plan, as well as the County, has either setback regulations (Morgan Hill) or policies (San José, Gilroy, County of Santa Clara) currently in place. However, these regulations and policies are not consistent among the jurisdictions. A condition is needed that will make regulatory guidance consistent for all covered activities across all jurisdictions. All covered activities must adhere to both the applicable existing local regulations and the requirements of the Plan.
- The main goal of the stream setback requirement is to minimize further degradation of stream and riparian communities from implementation of covered activities and to maintain basic biological and physical functions of stream and riparian systems.
- The purpose of the stream setback requirement within the urban service area is to, at a minimum, protect stream and riparian communities that provide habitat for covered species because these habitats are unique and cannot be conserved elsewhere within the study area.

Protection of streams and adjacent riparian vegetation under this condition would conserve habitat for California red-legged frog, foothill yellow-legged frog, western pond turtle, and least Bell's vireo. All of these species use stream and riparian habitats as either primary or secondary habitat, as described in Chapter 3, *Physical and Biological Resources*.

An analysis was performed to determine the overall value of the setback for protecting covered species' habitat. Modeled habitat protected by the setback was quantified and compared to the level of protection provided by the Reserve System alone. In GIS the habitat models for four covered species (California red-legged frog, foothill yellow-legged frog, western pond turtle, and least Bell's vireo) were overlaid with the expected locations and widths of riparian setbacks outside of the planning limit of urban growth (setback avoidance is not required inside the urban service area and so those areas were not included in this analysis) for all covered activities except rural residential development (exact location of rural residential development is not known at this time and thus could not be included in the analysis). Assuming all of these covered activities occur, an additional 2,855 acres (28%) of modeled breeding (primary) habitat for California red-legged frog and an additional 348 miles (50%) of modeled habitat (primary and secondary) for foothill yellow-legged frog would be avoided. Also, implementation of the stream setback would avoid an additional 837 acres (55%) of modeled habitat for least Bell's vireo. Setback benefits to these species and western pond turtle are summarized in **Table 6-5**. Stream habitat for covered species will likely overlap (i.e., miles and acres referenced in the table and above are not additive).

Definitions

The following terms are defined for this condition. These definitions are also found in the glossary (**Appendix A**).

Riparian habitat or riparian vegetation: Riparian vegetation is associated with river, stream, or lake banks and floodplains. Riparian vegetation is also defined by USFWS (2009) as plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (i.e., rivers, streams, lakes, or other watercourses). Riparian areas have one or both of the following characteristics: 1) distinctively different vegetation than adjacent areas, 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms due to the greater availability of surface and subsurface water.

Stream: A watercourse that flows at least periodically or intermittently through a bed or channel having banks. This may include watercourses having a surface or subsurface flow that supports or has supported riparian vegetation, fish or other aquatic life. In the context of the Habitat Plan, a watercourse must meet SCVWD "*Criteria to Verify or Identify a Watercourse as a Stream*" discussed below under *Framework* (Santa Clara Valley Water Resources Protection Collaborative 2006) to qualify as a stream.

Reach: A section of a stream. Reaches are defined based on a specific need (e.g., monitoring) and do not necessarily reflect a standard set of characteristics.

Perennial stream: A stream with year-round surface flow that is supplied by both rainfall runoff and groundwater, as well as by substantial dry-season inputs (e.g., runoff).

Intermittent stream: A stream that is supplied by both rainfall runoff and groundwater. Intermittent streams tend to be seasonal, with flow during the rainy season and into the late spring or early summer.

Ephemeral stream: A stream that flows only in response to rain events and receives no groundwater input. As defined in the Habitat Plan, ephemeral streams will not include irrigation ditches, underground streams, or drainages and swales that have neither defined bed and bank nor evidence of scour or sediment transport. All other ephemeral drainages that qualify as streams will be considered under the Habitat Plan.

Framework

This condition will apply to all covered activities, including those within the Reserve System. This condition also has exemptions and exceptions as described in subsequent sections below.

The width of the setback is driven by the following criteria:

- stream community,
- slope, and
- location of the covered activity in relation to the urban service area of each local jurisdiction.

Each of these criteria is described below.

Stream Community

Stream communities are grouped into two simplified categories for the purposes of this condition. These categories are based on broad definitions of the biological characteristics of those communities and correspond to the level of habitat quality for covered species and sensitive riparian communities within the study area. Categories for the stream setback requirement are provided below.

- **Category 1**. This stream type has sufficient flow to support covered species and riparian habitat. These streams include perennial streams and some intermittent streams. These streams are typically larger than ephemeral drainages and support movement of covered species along the length of the stream. The ability of these streams to also support healthy riparian habitats bolsters the ecological value of the stream. This category also includes all in-channel ponds downstream of reservoirs. These streams are shown in **Figure 6-2**[16]**.**
- **Category 2**. This stream type may not have sufficient flow to support covered species and riparian habitat. These streams include all ephemeral streams and some intermittent stream reaches. These reaches provide minimum support of water-quality functions and primary breeding habitat for

[16] **Figure 6-2** may be periodically updated by the Implementing Entity in consultation with the Wildlife Agencies as new data becomes available.

covered species. Category 2 streams are not specifically mapped as part of the Habitat Plan. They include both identified streams (named creeks and USGS blueline creeks) that are not classified as Category 1 streams (as shown in **Figure 6-2**) and other unmapped streams that meet the "Criteria to Verify or Identify a Watercourse as a Stream" as defined below.

Categories are applied to reaches of streams as opposed to entire streams. This is because almost all streams begin in the uppermost portions of their watersheds as ephemeral streams and gradually become intermittent or perennial and they move downslope and accumulate flows from the watershed and, sometimes, the groundwater basin. As such, a single stream may contain both Category 1 and Category 2 reaches.

The mapped stream network for the Habitat Plan does not differentiate between perennial, intermittent, and ephemeral drainages. However, SCVWD developed a map of all fish-bearing streams in the study area. While fish are not covered by this Plan, presence of fish is a good indicator of the stream type. For example, ephemeral streams do not generally support fish. As such, the stream categories are identified using fish-bearing or non-fish bearing streams as a proxy for Category 1 and Category 2 streams, respectively. Reaches for which fish data are unknown are assumed not to support fish and are included in Category 2. Category 2 reaches cannot occur downstream of a Category 1 reach.

Criteria to Verify or Identify a Watercourse as a Stream

While all Category 1 streams are mapped by the Plan, not all Category 2 streams are mapped. If a watercourse is not mapped by the Plan, but does meet the following criteria, it will be classified as a Category 2 stream. The following is based on the *Santa Clara Valley Water Resources Protection Collaborative* (2006).

A watercourse which does not appear to fit into one of the two described stream categories may be considered a stream if the director of the planning department of the local jurisdiction determines that the watercourse complies with all of the following three criteria:

1. the watercourse is hydrologically connected to a waterway above and below the site or is connected to a spring, headwaters, lake, and/or bay based on satisfying at least one of the conditions identified in paragraph (A) below; and
2. the watercourse is within a defined channel which includes a bed, bank, and exhibits features that indicate actual or potential sediment movement based on satisfying at least one of the conditions identified in paragraph (B) below; and
3. the watercourse occupies a specific topographic position based on satisfying at least one of the conditions identified in paragraph (C) below.

In determining whether the subject watercourse possesses these three features, the following criteria will be examined by the Local Partner with jurisdiction over the covered activity. If necessary, this determination may require the technical expertise and recommendations of a qualified biologist, hydrologist, or other qualified professional. In addition, the Local Partner with jurisdiction over the covered activity may require the project proponent to provide additional information as deemed necessary to determine if the watercourse satisfies the three criteria listed below.

This process will not be used to determine if a CDFG Streambed Alteration Agreement will be required pursuant to Section 1600 et seq. of the California Fish and Game Code or to determine if a Corps Section 404 Clean Water Act permit will be required.

A. Hydrologic Connectivity—Criterion #1 above will be considered met if any of the following conditions are present:

1. Stream headwaters, springs, in-channel culverts, underground seepage, or groundwater flow are present and capable of providing hydrologic connectivity to recognized watercourses. Sections of stream placed underground by manmade infrastructure (e.g., culverts) are not considered streams for the purpose of this condition except as noted in paragraph B item 4 below.
2. Streams may become connected across or over manmade improvements such as roads (e.g., a temporary connection during a storm event). Except for stream channel improvements, water flowing across or over such improvements within the public right-of-way is not considered a stream. Sections above and/or below this connectivity are streams if they meet the other required features.
3. Springs are present and are considered part of a stream if located above (uphill from) stream initiation.

B. Channel Form—Criterion #2 above will be considered met if any of the following conditions are present:

1. The watercourse has a stream channel, beginning at the point of bed and bank initiation, which may be natural, altered, or engineered.
2. The stream channel must have enough flow under present-day conditions to maintain channel form and to move sediment. A non-engineered stream channel bed and bank are created and maintained by erosion and sedimentation, thus the presence of a channel with bed and bank is itself evidence of sufficient flow. Flow volume or timing is not criteria for stream determination.
3. The stream channel has evidence of scour, sedimentation, sediment sorting, undercut banks and/or other erosion, deposition, or transport features —all of which support sediment movement.

   Engineered or altered channels exist and are partially or wholly made of earth, concrete, rip rap, or other materials. The hardened nature of these channels bed and banks, and a lack of available sediment along the channel reach, may prevent signs of sediment movement or scour. Such channels need not have explicit evidence of sediment transport.

4. A currently underground stream was filled without appropriate permits from all applicable regulatory agencies (federal, state, and local) or is underground due to a landslide.

C. Topographic Position—Criterion #3 above will be considered met if any of the following conditions are present:

1. The watercourse is either a ‘U’ or ‘V’ shaped channel typically located at the low point of a macro-topographic feature.
2. The watercourse consists of bowl, ‘U’, or ‘V’ shaped topography with high points draining to valley or ravine as part of a large drainage network leading to large streams, lakes and/or a bay.
3. The watercourse located on flatland consists of shallow bowl or ‘U’ shaped topography. Generally these streams flow from the hills toward a bay following the slope of the land.

Stream topography can be indicated on a topography map by a ‘U’ or ‘V’ shape pointed in the uphill direction.

Slope

Slope is an important determinant of soil stability and therefore erosion and sedimentation rates into streams. Steeper slopes erode faster and are more susceptible to disturbance by the covered activities. To account for these factors, stream setback requirements are greater on steeper slopes. The slope categories developed for the Habitat Plan were based on slope-stability categories in local codes and guidelines. Two slope categories were created. Slope categories are as follows.

- **0%–30% Slopes**. Generally stable slopes. This category does not require additional setbacks beyond those identified above.
- **>30% Slopes**. Increasingly unstable slopes. This category requires increase protection and greater stream setbacks.

If the development area as described in Condition 7 is located within 200 feet of a Category 1 stream, the project proponent will include site topography on the development area map (see Section 6.8.2 *Item 2: Project Description and Map*) in 5-foot intervals in elevation. The project proponent will also calculate the average slope of the development area to determine how this criterion is applied. Slope is defined as the average natural slope of the land within the proposed development area based on an engineered site plan. The average slope is determined by the formula:

$S = (I*L/ A)*100$, where

S is the average slope of the area in percent; *I* is the contour interval in feet; *L* is the combined length of contour lines in feet; and A is the area of the development area. Average site slope will be calculated by a registered civil engineer or licensed land surveyor. **Figure 6-3a** illustrates an example setback based on slope.

Urban Service Area

Different setback distances will be applied depending on whether the covered activity occurs within the urban service area[17] (as adopted and mapped by LAFCO and defined by each city's General Plan at the time of adoption of the Habitat Plan) or outside the urban service area. Within the urban service area of San José, Morgan Hill, and Gilroy, there is typically extensive existing urban development. Due to past land-use policies, this development may have limited or no setbacks from streams. As such, these areas tend to be developed or highly altered from a natural state and the overall habitat value for covered species is less than in the rural areas. The stream setback requirement for covered activities within the urban service area is therefore modest and consistent with existing land uses. This setback also recognizes the limited potential for new development within the urban service area to provide stream protections.

Outside of the urban service area, stream setbacks are greater to maximize protection of existing stream functions and values and to provide additional opportunities for stream and riparian protection and restoration (see Chapter 5). Stream setbacks outside the urban service area take into account the opportunity to establish protective setbacks and to pro-actively prevent degradation seen within the urban service area from past development. The difference between setbacks inside and outside of the urban service area reflects the fact that lands within the urban service area provide a minimum amount of habitat in support of basic ecological functions including connectivity for covered species, while stream and riparian habitat outside of the urban service area will be instrumental in successful implementation of the conservation strategy.

Required Setbacks

Stream setback requirements have been developed on the basis of an extensive literature review of applicable research from both local and national sources (**Table 6-6**) and in consultation with the Wildlife Agencies. Scientific studies to determine minimum setbacks typically recommend relatively modest setbacks (an average of 58 feet) to protect water quality (e.g., sediment and nutrient loading). Recommended setbacks to enhance stream ecology were greater and ranged from 85 to 220 feet with an average of 132 feet. Setbacks intended to provide protection for plants and wildlife were the greatest and ranged from 30 to 1,600 feet, with an average range of 335 to 410 feet (**Table 6-6**).

Working from scientifically rigorous definitions of appropriate setbacks, further refinement of setbacks was coordinated with the Local Partners to determine setback widths that, while consistent with the literature, limited the number of situations in which the setback would create undue hardship upon property owners or be infeasible to implement on a consistent basis (the setback would

[17] The urban service area was used instead of the planning limit of urban growth because the urban service area represents the current boundary of urban development, not the future boundary after implementation of all covered activities. The Local Partners felt strongly that stricter riparian setbacks should be applied outside the urban service area to maximize protection of stream and riparian areas prior to urbanization of these areas.

create a large number of property exemptions). As such, the setbacks identified for this Plan (35 to 250 feet) balance the need to protect ecological functions with surrounding land uses and private property constraints.

A stream setback, measured from top of the stream bank, will be applied to all covered activities as shown in **Table 6-7**. To facilitate implementation of this condition, required setbacks are described below based on project location. **Figures 6-3a through 6-3d** illustrate different applications of the setback.

Inside the Urban Service Area

Inside the urban service area at the time of Plan adoption, the setback for Category 1 streams is 100 feet (**Figure 6-3b**). The setback is increased by 50 feet for parcels with slopes greater than 30% to compensate for increased slope instability and higher anticipated rates of erosion. In addition, if the site supports riparian vegetation the setback is equal to either the riparian edge plus a 35 foot buffer or the setback as defined above, whichever is greater.

The setback for all Category 2 streams is 35 feet regardless of location or slope (see **Figure 6-3c**). In addition, if the site supports riparian vegetation, the setback is extended to include the riparian edge plus a 35-foot buffer. The 35-foot buffer is based on a minimum setback distance of 33 feet suggested for sediment and nutrient reduction (Corley et al. 1999). Ephemeral streams, while constituting the majority of streams affected by this condition, are not commonly mapped due to inherent difficulties in mapping ephemeral tributaries in the study area. Unmapped ephemeral streams will only be subject to the required setback if the criteria for defining a watercourse discussed under *Framework* are met for hydrologic connectivity, channel form, and topographic position (Santa Clara Valley Water Resources Protection Collaborative 2006). The applicable local jurisdiction is responsible for making determinations of whether a watercourse qualifies as a Category 2 stream and for implementing setbacks. Each local jurisdiction may also choose to extend the setback beyond 35 feet in cases where site-specific slope and geological characteristics warrant increased protection.

If the project proponent complies with the stream setback when implementing covered activities (i.e., the project avoids the setback), the area of the setback will be excluded from the development fee calculation for the project. The project will be tracked as the parcel or development area excluding the avoided setback so that local jurisdictions are able to identify new impacts in future project applications.

Outside the Urban Service Area

Outside of the urban service area, setback requirements are greater. For Category 1 streams the setback distance is 150 feet (see **Figure 6-3d**). The setback is increased by 50 feet for slopes greater than 30% to compensate for increased slope instability and higher anticipated rates of erosion (**Figure 6-3a**). In addition, if the site supports riparian vegetation, the setback is either the riparian edge plus a 35-foot buffer or the setback described above, whichever is greater.

As described above for required setbacks "*Inside the Urban Service Area*," the setback for all Category 2 streams is 35 feet regardless of location or slope (**Figure 6-3c**). If the site supports riparian vegetation, the setback will extend from the riparian edge plus a 35-foot buffer.

Unless a covered activity meets the "Exemption" criteria or is granted a stream setback exception, as described below, implementation of covered activities is prohibited within the stream setback.

Project proponents of projects located outside the urban service area must ensure that the development area does not encroach into the stream setback unless an exemption or an exception is applied. Projects or portions of projects that qualify for an exemption or exception are described below.

If a project proponent chooses to offer a conservation easement onstream setback areas, and the Implementing Entity and Wildlife Agencies approve, the contribution of the area placed under conservation easement may offset development fees as described below under *Fees and Conservation Easements*, and the land will become part of the Reserve System and contribute to the Plan's requirements for riparian preservation (**Table 5-13**).

Exemptions

The exemptions below apply regardless of location. If a covered activity qualifies for an exemption, a stream setback is not applied and the project proponent is not required to comply with this condition. However, other conditions may still apply and the project is still required to pay all applicable fees (e.g., land cover fee, wetland fee) as described in Chapter 9. Exemptions from the stream setback include the following.

1. Any activity that is not a covered activity and not subject to the Habitat Plan or its conditions.
2. Activities listed as exempt in Section 6.2.
3. Development on parcels less than 0.5 acre.
4. Covered activities that require work within or adjacent to streams such as bridges, levee maintenance and repair, flood-protection projects, stream maintenance, outfall installation and maintenance, flood-protection capital projects, dam-related capital projects.
5. Recreational trails (see Condition 4 and 9 for details on trail siting).
6. Replacement of utilities that result in no new permanent disturbance to the riparian corridor during construction and operation and generate only temporary loss of habitat. (This exemption does not apply for utility projects that result in new permanent riparian impacts.)
7. Stream crossings essential to provide a means of access to parcel or facility.

Exceptions

Stream setback policies that apply to a large number of parcels with varying characteristics require a clear and practical set of exceptions. The term exception means an allowance for reductions in mandated setback distances necessary to allow reasonable use and development of a property based on the variety of constraints and factors that may affect the property. In situations where exceptions are granted, portions of this stream setback condition may still apply. Exceptions will be used in a minority of cases with special circumstances that limit or restrict the ability of a landowner to fully apply the stream setback. For example, geologic and seismic hazards, unusual lot size or configurations, unusual slope, or grading and access issues may present site constraints that require exceptions to the stream setback condition in order to allow reasonable development of a site consistent with local land use regulations.

For all proposed exceptions to the stream setbacks (inside or outside the urban service area), exceptions will be considered based on the following factors:

1. The existence of legal uses within the setback.
2. The extent to which meeting the required setback would result in a demonstrable hardship (i.e., denies an owner any economically viable use of his land or adversely affects recognized real property interests) for the applicant.
3. The extent to which meeting the required setback would require deviation from, exceptions to, or variances from other established policies, ordinances or standards regarding grading, access, water supply, wastewater treatment, disposal systems, geologic hazards, zoning, or other established code standards.
4. The stream setback exception does not preclude achieving the biological goals and objectives of the Habitat Plan or conflict with other applicable requirements of the Habitat Plan and local policies.

Regardless of project location, stream setback exceptions may not reduce a Category 1 stream setback to less than a distance of 50 feet for new development or 35 feet for existing or previously developed sites with legal buildings and uses (**Figure 6-3b**). All applicable fees must be paid for areas granted an exception.

Exceptions may be requested through the standard application process described in Section 6.8, or through a separate request process. Applicants must apply for a stream-setback exception through their local jurisdiction. All private applications for stream-setback exceptions must be reviewed and approved by the local jurisdiction. For projects implemented by a local jurisdiction, exception requests must be made to the Implementing Entity. The findings required to approve the stream setback exception must be supported by factual information and judgments in the record.

As part of the review process, the local jurisdiction or the Implementing Entity must consider the implications of a reduced setback on the riparian system and covered species, progress toward the biological goals and objective of the Plan, and potential effects on adjacent properties. The local jurisdiction or the Implementing Entity must make written findings that document these considerations and the rationale for the stream-setback exception (see below for specific required findings). The local jurisdiction or the Implementing Entity may require technical reports from qualified professionals or consultants to support the application or request. For example, for any significant proposed reduction, a report by a qualified biologist, stream hydrologist, registered engineer, or other professional may be required as a basis for making necessary findings. Please see Section 6.8.5 for definition of a “qualified biologist.”

If the stream setback exception is granted at an administrative level (Zoning Administrator) or by a designated decision-making authority (Planning Commission), local agencies must include provisions that allow appeal of this decision to the elected legislative body of the applicable agency. Applicable fees may be imposed by the legislative body for processing such appeals, as well as for the original exception requests.

Prior to granting the exception, the local jurisdiction will provide the exception request and proposed decision to both the Implementing Entity and the Wildlife Agencies for review and comment. The Implementing Entity and Wildlife Agencies will have 30 days to review the request and provide a written response. A local agency cannot take an action until after that 30 day-period. The Implementing Entity will compile a list of all exceptions granted each calendar year for inclusion in the annual report to the Wildlife Agencies.

Fees and Conservation Easements

If the stream setback is precluded from future development by a permanent conservation easement offered voluntarily by the landowner, and the easement is acceptable to the Implementing Entity and Wildlife Agencies and consistent with the Plan Reserve System (as described in Chapter 8, Section 8.6.3), a portion of the land cover fee for the covered activity (i.e., the fee for impacts to land cover types outside of the setback) may be waived by the Implementing Entity. If the value of the easement, in terms of area and resource value, exceeds the fee, credit cannot be “banked” for other projects (i.e., the Implementing Entity will not compensate for excess credit). Partial fee waivers for setbacks will be determined on a case-by-case basis by the Implementing Entity according to the criteria in Chapter 9, Section 9.4.1, subheading *Land Provided in Lieu of Development Fee*.

Each local jurisdiction may also consider imposing a conservation easement as a requirement for development approval when there is a direct nexus between the effects or impacts of a project and the need for an easement. The Implementing Entity will provide technical assistance to the local jurisdiction to determine whether a conservation easement is warranted. An easement must also demonstrate rough proportionality with the impact of the project.

Condition 12. Wetland and Pond Avoidance and Minimization

The purpose of this condition is to minimize direct and indirect impacts to wetlands and ponds and in some cases, avoid direct and indirect impacts to high quality wetlands and ponds. Direct impacts are those that directly affect a wetland or a pond within its mapped boundary (see Section 6.8.4 *Item 4: Map of Wetlands and Waters* for a description of mapping direct impacts to wetlands). Project proponents are required to pay a wetland fee for impacts to wetlands and ponds to cover the cost of restoration or creation of aquatic land cover types required by this Plan (see Chapter 9 for details on this wetland fee). Covered activities can avoid paying the wetland fee if they avoid impacts to the wetland.

All project proponents will implement the following actions to avoid and minimize impacts of covered activities on wetlands and ponds.

Planning Actions

- Projects must be designed to avoid and minimize impacts to wetlands to the maximum extent practicable.
- Applicants with streams on site must follow the stream setback requirements in Condition 11.
- Applicants for coverage under the Plan must follow the requirements and guidelines in Condition 3 to minimize the effects of development on downstream hydrology, streams, and wetlands.

Design

- Locate septic facilities, if used, at least 100 feet from the edge of a wetland or pond if space allows.
- If the runoff from the development will flow within 100 feet of a wetland or pond, install vegetated stormwater filtration features, such as rain gardens, grass swales, tree box filters, or infiltration basins, to capture and treat flows.
- Plant native vegetation (shrubs and small trees) between the wetland or pond and the development such that the line of sight between the wetland or pond and the development is shielded.
- If during the environmental review process it is shown that a project has adverse indirect impacts to the wetland's function (change in hydrological functions, etc.), the project will be required to avoid these indirect effects, as determined on a case-by-case approach by the local jurisdiction, in consultation with the Implementing Entity. If a Local Partner is carrying out the activity, it will coordinate avoidance measures with the Implementing Entity. Wetlands that are not completely avoided, including indirect effects, will be considered permanently impacted and will count towards the impact

caps described in **Table 4-2** and will be assessed fees as described in Chapter 9. If however, the local jurisdiction demonstrates to the Wildlife Agencies that the wetlands to be indirectly affected are highly degraded prior to project impacts, and the Wildlife Agencies agree, impacts will not be counted toward the impact caps described in **Table 4-2** and fees will not be assessed. "Highly degraded" wetlands could include, but are not limited to, those that are indirectly affected by surrounding development or agriculture to the extent that hydrology, water quality, or habitat for covered species is adversely affected.

Construction Actions

- Personnel conducting ground-disturbing activities in or adjacent to wetlands and ponds will be trained by a qualified biologist in these avoidance and minimization measures and the permit obligations of project proponents working under this Plan.
- All wetlands and ponds to be avoided by covered activities will be temporarily staked in the field by a qualified biologist to ensure that construction equipment and personnel avoid these features.
- Fencing will be erected along the outer edge of the project area, between the project area and a wetland or pond. The type of fencing will match the activity and impact types. For example, projects that have the potential to cause erosion will require erosion control barriers (see below), and projects that may bring more household pets to a site will be fenced to exclude pets. The temporal requirements for fencing also depend on the activity and impact type. For example, fencing for permanent impacts will be permanent, and fencing for short-term impacts will be removed after the activity is completed.
- Appropriate erosion control measures (e.g., fiber rolls, filter fences, vegetative buffer strips) will be used on site to reduce siltation and runoff of contaminants into wetlands, ponds, streams, or riparian woodland/scrub. Filter fences and mesh will be of material that will not entrap reptiles and amphibians. Erosion control blankets will be used as a last resort because of their tendency to biodegrade slowly and trap reptiles and amphibians.
- Erosion-control measures will be placed between the wetland or pond and the outer edge of the project site.
- Fiber rolls used for erosion control will be certified as free of noxious weed seed.
- Seed mixtures applied for erosion control will not contain invasive nonnative species, but will rather be composed of native species appropriate for the site or sterile nonnative species. If sterile nonnative species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive nonnatives.

- Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas.
- Trash generated by covered activities will be promptly and properly removed from the site.
- No construction or maintenance vehicles will be refueled within 200 feet of avoided wetlands and ponds unless a bermed and lined refueling area is constructed and hazardous material absorbent pads are available in the event of a spill.
- All management of pest species will be conducted in compliance with the County integrated pest management (IPM) ordinance. In addition, other requirements identified in this chapter that exceed the requirements of the IPM ordinance will be implemented.
- Where appropriate to control serious invasive plants, herbicides that have been approved by EPA for use in or adjacent to aquatic habitats may be used as long as label instructions are followed and applications avoid or minimize impacts on covered species and their habitats. In wetland environments, appropriate herbicides may be applied during the dry season to control nonnative invasive species (e.g., yellow star-thistle). Herbicide drift will be minimized by applying the herbicide as close to the target area as possible. Herbicides will only be applied by certified personnel in accordance with label instructions.
- All organic matter should be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with ponds, wetlands, or potentially contaminated sediments. Items should be rinsed with clean water before leaving each study site (U.S. Fish and Wildlife Service 2005).
- Implement measures to minimize the spread of disease and non-native species based on current Wildlife Agency protocols (e.g., *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog: Appendix B, Recommended Equipment Decontamination Procedures* [U.S. Fish and Wildlife Service 2005]) and other best available science.
- Used cleaning materials (liquids, etc.) should be disposed of safely, and if necessary, taken off site for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags (U.S. Fish and Wildlife Service 2005).
- Portions of the project that occur in streams will comply with Condition 4.

Condition 13. Serpentine and Associated Covered Species Avoidance and Minimization

Serpentine soils comprise four land cover types in the study area: serpentine bunchgrass grassland, serpentine rock outcrops, serpentine seeps, and serpentine chaparral. These land cover types are estimated to encompass 14,314 acres in the study area. Additional unmapped areas of serpentine may be discovered during implementation because it often occurs in small patches that could not be discerned at the scale of the mapping and available data.

Most of the serpentine areas in the study area are expected to be acquired as part of the Reserve System (see Chapter 5 for specific targets). However, some impacts on these land cover types may still occur (e.g., allowable impacts to serpentine bunchgrass grassland are limited to 550 acres [**Table 4-2]**). Because of the high importance and rarity of serpentine soils and their habitats, these areas will be avoided whenever feasible during project planning.

In cases where serpentine areas are part of a project site in a developed area, the project will be designed to preserve larger patches of serpentine outside the development area and limit impacts to the smallest patches feasible and to the edges of serpentine patches regardless of their size. The length of the edge of the serpentine patch that is directly adjacent to the developed area will be minimized and will include as large a buffer as possible between the serpentine edge and the developed area. Landscaping will not be planted on serpentine areas except as needed to reduce fire hazards adjacent to structures consistent with County fire hazard reduction regulations (see also Condition 10). Plantings will not include species that are known or suspected to invade serpentine habitats or cross-pollinate with endemic serpentine plant species or other native plants.

On undeveloped sites, the project area and construction staging area must be located to avoid or minimize impacts to any serpentine on site. The guidelines described above for developed areas will also be followed for project sites in undeveloped areas.

Where mapped serpentine cannot be avoided, the minimization measures listed below will be implemented.

- Conduct surveys of the serpentine vegetation to inventory for covered species and evaluate habitat quality for covered species.
- For portions of the development area that are in Bay checkerspot butterfly habitat units identified in Appendix D, survey the site for the presence of larval host plants of Bay checkerspot butterfly. If larval host plants are found, conduct reconnaissance level surveys for adult butterflies during the peak of the flight period to determine species presence or absence.
- Locate the project footprint as far from the covered species or the highest-quality serpentine habitat as is feasible. Utilize applicable buffers as identified in this chapter.
- If covered plants occur on the site and cannot be avoided, notify the Implementing Entity of the construction schedule so that plant salvage can be considered and potentially implemented (see Condition 19).

Condition 14. Valley Oak and Blue Oak Woodland Avoidance and Minimization

Valley oak woodland and blue oak woodland are considered by CDFG to be sensitive biotic communities (California Department of Fish and Game 2003). There is evidence that valley oak woodland was once one of the dominant land cover types on the floor of the Santa Clara Valley, but it has been largely removed by urban and agricultural development (San Francisco Estuary Institute 2006, 2008). These communities can provide important foraging or movement habitat for species covered by the Plan—California red-legged frog, and California tiger salamander—as well as for many other native species. For these reasons, these two oak woodland land cover types would benefit from some avoidance and minimization associated with covered activities.

All covered activities will implement the following actions to avoid or minimize impacts on valley and blue oak woodland.

Project Planning

- Projects on sites supporting substantial stands of valley oak woodland or blue oak woodland will minimize their impacts on these communities and preserve these stands on site when to do so would further the biological goals and objectives of the Plan. For example, projects should preserve oak woodland communities that are adjacent to existing stands of protected oak woodlands to avoid habitat fragmentation and degradation of wildlife linkages.
- Projects will avoid to the maximum extent feasible irrigating in and around valley oak woodland and will avoid altering hydrology of the site, including location of septic leach fields, such that valley oak woodland receives more water than under pre-project conditions.
- Large and healthy trees will be maintained on site whenever feasible. Local jurisdictions may set tree size thresholds for preservation that are consistent with local tree ordinances. Large valley oak trees still healthy today are clearly visible on air photos from as far back as 1939 (San Francisco Estuary Institute 2006), even though they are surrounded by agricultural fields or urban development. Preserved trees can provide habitat value for many decades; they also provide a significant community amenity.
- If trees are maintained on a site, buffer zones will be established between preserved valley oak or blue oak trees and development at a distance equal to or greater than the root protection zone, which is defined as a buffer zone determined by calculating one foot for each inch of trunk diameter measured at 4.5 feet above ground surface (Matheny and Clark 1998).

Project Construction

- Temporary project access points will be constructed as close as possible to the work area to minimize necessity for tree removal.
- Roads and pathways will be aligned outside of the tree's root protection zone (as defined above) whenever possible.
- Roads and pathways designed beneath or within 25 feet of the dripline of oak trees will be graded using hand-held equipment and will use permeable surfacing (e.g., grass pavers that allow runoff to infiltrate the ground).
- Alteration of natural grade through fill or other means within the root protection zone of oak trees will be minimized.
- Trenching for utility lines and other purposes will be minimized within root protection zones. Utilities may be installed in these areas by boring below the root zone.
- If extensive pruning of blue oaks and valley oaks is necessary, pruning will be conducted during the winter dormant period for these species and under the supervision of an arborist certified to International Society of Arboriculture or similar standards.

6.6 Conditions to Minimize Impacts on Specific Covered Species

Species-specific conditions are presented below. The timing of species habitat surveys, preconstruction surveys, and construction monitoring relative to impacts are described below and summarized in **Table 6-8**. For long term projects and projects that are phased[18], the frequency and timing of surveys relative to impacts will be determined by the local jurisdiction or Implementing Entity in coordination with the Wildlife Agencies on a case-by-case basis. At a minimum, surveys and monitoring (if required) will be done prior to each construction phase if the entire project area is not continuously disturbed between phases.

The Implementing Entity will maintain and update modeled habitat maps based on guidance provided in Chapter 7, *Monitoring and Adaptive Management Program.* For species that require surveys based on modeled habitat[19], qualified biologists will utilize the most current modeled habitat maps available from the Implementing Entity to guide where surveys must be conducted. Surveys will be conducted based on modeled habitat maps that are updated throughout Plan implementation. Similarly, the Implementing Entity will track impacts to modeled habitat based on modeled habitat maps updated during Plan implementation.

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[18] Phasing may include planned phasing of construction (e.g., multi-year phasing of a road construction project), or unplanned gaps in construction activity.
[19] San Joaquin kit fox, western burrowing owl, and Bay checkerspot butterfly.

6.6.1 Selected Covered Wildlife Species

Conditions 15–18 identify conditions on covered activities that are specific to some of the covered species. Activities that may affect these covered species must also adhere to other applicable conditions in this chapter, including Condition 1, *Avoid Direct Impacts on Legally Protected Plant and Wildlife Species*. A summary of species surveys, preconstruction surveys, and construction monitoring requirements is provided in **Table 6-8**.

Condition 15. Western Burrowing Owl

To avoid or minimize direct impacts of covered activities on western burrowing owls, the procedures described below will be implemented. This condition incorporates survey, avoidance, and minimization guidelines from the following western burrowing owl conservation plans and other sources pertaining to the study area. The avoidance and minimization process for western burrowing owl as required in this condition is illustrated in **Figure 6-4**.

- CDFG *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 1995).
- CDFG *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012).
- *Draft Burrowing Owl Habitat Conservation Strategy and Implementation Plan* (City of San José 2000).
- *City of Morgan Hill—Citywide Burrowing Owl Habitat Mitigation Plan* (City of Morgan Hill 2003).
- Personal communication with Jack Barclay regarding ongoing monitoring efforts in the study area including annual monitoring at San José International Airport.
- Various unpublished reports from survey efforts in the study area.
- Guidance from CDFG.

Western Burrowing Owl Habitat Survey

Western burrowing owl habitat surveys will be required in the study area in all modeled occupied nesting habitat (see **Figure 5-11**). Surveys are not required in sites that are mapped as potential burrowing owl nesting or only overwintering habitat. Modeled habitat types may change throughout the permit term based on the best available scientific data. For example, the Implementing Entity will be conducting annual surveys or collecting annual survey data of other organizations in occupied nesting habitat throughout the permitarea to determine the annual status of known nesting areas the number of adult breeding owls present. The Implementing Entity will also coordinate with other South Bay local governments, special districts, and non-profit organizations every 3 years to assess status of the burrowing owl population in the entire study area and the expanded study area for burrowing owl conservation, outside areas of modeled occupied habitat.

Habitat surveys in occupied nesting habitat are required in both breeding and non-breeding seasons. If the project site falls within occupied nesting habitat, a qualified biologist will map areas with burrows (i.e., areas of highest likelihood of burrowing owl activity) and all burrows that may be occupied (as indicated by tracks, feathers, egg shell fragments, pellets, prey remains, or excrement) on the project site. This mapping will be conducted while walking transects throughout the entire project footprint, plus all accessible areas within a 250-foot radius from the project footprint. The centerline of these transects will be no more than 50 feet apart and will vary in width to account for changes in terrain and vegetation that can preclude complete visual coverage of the area. For example, in hilly terrain with patches of tall grass, transects will be closer together, while in open areas with little vegetation they can be 50 feet apart.

This methodology is consistent with other accepted survey protocols for this species (California Burrowing Owl Consortium 1993). The Implementing Entity may update this protocol during the permit term based on changes to the accepted protocol with the concurrence of the Wildlife Agencies. Adjacent parcels under different land ownership will be surveyed only if access is granted or if the parcels are visible from authorized areas.

If suitable habitat is identified during the habitat survey, and if the project does not fully avoid impacts to the suitable habitat, preconstruction surveys will be required. Suitable habitat is fully avoided if the project footprint does not impinge on a 250-foot buffer around the suitable burrow.

Preconstruction Survey

Prior to any ground disturbance related to covered activities, a qualified biologist will conduct preconstruction surveys in all suitable habitat areas as identified during habitat surveys. The purpose of the preconstruction surveys is to document the presence or absence of burrowing owls on the project site, particularly in areas within 250 feet of construction activity.

To maximize the likelihood of detecting owls, the preconstruction survey will last a minimum of three hours. The survey will begin 1 hour before sunrise and continue until 2 hours after sunrise (3 hours total) or begin 2 hours before sunset and continue until 1 hour after sunset. Additional time may be required for large project sites. A minimum of two surveys will be conducted (if owls are detected on the first survey, a second survey is not needed). All owls observed will be counted and their location will be mapped.

Surveys will conclude no more than 2 calendar days prior to construction. Therefore, the project proponent must begin surveys no more than 4 days prior to construction (2 days of surveying plus up to 2 days between surveys and construction). To avoid last minute changes in schedule or contracting that may occur if burrowing owls are found, the project proponent may also conduct a preliminary survey up to 14 days before construction. This preliminary survey may count as the first of the two required surveys as long as the second survey concludes no more than 2 calendar days in advance of construction.

Implementation of Covered Activities in Burrowing Owl Habitat

In order to allow covered activities to go forward in burrowing owl habitat prior to the formal take authorization of individuals described above, project applicants will employ avoidance measures described below to ensure that direct take does not occur. Application of these measures is illustrated in **Figure 6-4**. The below avoidance measures apply to all projects that affect any burrowing owl habitat, regardless of whether surveys are required by this condition. In other words, if a project is occurring outside of modeled occupied nesting habitat, the project proponent is obligated to ensure avoidance and minimization of impact to burrowing owls according to the measures described below.

Avoidance Measures

Breeding Season

If evidence of western burrowing owls is found during the breeding season (February 1–August 31), the project proponent will avoid all nest sites that could be disturbed by project construction during the remainder of the breeding season or while the nest is occupied by adults or young (occupation includes individuals or family groups foraging on or near the site following fledging). Avoidance will include establishment of a 250-foot non-disturbance buffer zone around nests. Construction may occur outside of the 250-foot non-disturbance buffer zone. Construction may occur inside of the 250-foot non-disturbance buffer during the breeding season if:

- the nest is not disturbed, and
- the project proponent develops an avoidance, minimization, and monitoring plan that will be reviewed by the Implementing Entity and the Wildlife Agencies prior to project construction based on the following criteria.
    - The Implementing Entity and the Wildlife Agencies approves of the avoidance and minimization plan provided by the project applicant.
    - A qualified biologist monitors the owls for at least 3 days prior to construction to determine baseline nesting and foraging behavior (i.e., behavior without construction).
    - The same qualified biologist monitors the owls during construction and finds no change in owl nesting and foraging behavior in response to construction activities.

- If there is any change in owl nesting and foraging behavior as a result of construction activities, these activities will cease within the 250-foot buffer. Construction cannot resume within the 250-foot buffer until the adults and juveniles from the occupied burrows have moved out of the project site.
- If monitoring indicates that the nest is abandoned prior to the end of nesting season and the burrow is no longer in use by owls, the non-disturbance buffer zone may be removed. The biologist will excavate the burrow to prevent reoccupation after receiving approval from the Wildlife Agencies.

The Implementing Entity and the Wildlife Agencies have 21 calendar days to respond to a request from the project proponent to review the proposed construction monitoring plan. If these parties do not respond within 21 calendar days, it will be presumed that they concur with the proposal and work can commence.

Non-Breeding Season

During the non-breeding season (September 1–January 31), the project proponent will establish a 250-foot non-disturbance buffer around occupied burrows as determined by a qualified biologist. Construction activities outside of this 250-foot buffer are allowed. Construction activities within the non-disturbance buffer are allowed if the following criteria are met in order to prevent owls from abandoning important overwintering sites.

- A qualified biologist monitors the owls for at least 3 days prior to construction to determine baseline foraging behavior (i.e., behavior without construction).
- The same qualified biologist monitors the owls during construction and finds no change in owl foraging behavior in response to construction activities.
- If there is any change in owl nesting and foraging behavior as a result of construction activities, these activities will cease within the 250-foot buffer.
- If the owls are gone for at least one week, the project proponent may request approval from the Implementing Entity that a qualified biologist excavate usable burrows to prevent owls from re-occupying the site. After all usable burrows are excavated, the buffer zone will be removed and construction may continue.

Monitoring must continue as described above for the non-breeding season as long as the burrow remains active.

Construction Monitoring

Based on the avoidance, minimization, and monitoring plan developed (as required in the above section), during construction, the non-disturbance buffer zones will be established and maintained if applicable. A qualified biologist will monitor the site consistent with the requirements described above to ensure that buffers are enforced and owls are not disturbed. The biological monitor will also conduct training of construction personnel on the avoidance procedures, buffer zones, and protocols in the event that a burrowing owl flies into an active construction zone.

Passive Relocation

Passive relocation would not be allowed under the Plan until the positive growth trend described in Section 5.4.6 is achieved. Once this occurs, passive owl relocation may be allowed, with the approval of the Wildlife Agencies, on project sites in the non-breeding season (September 1–January 31) if the other measures described in this condition do not allow work to continue. Passive relocation would only be proposed if the burrow needed to be removed, or had the potential of collapsing (e.g., from construction activities), as a result of the covered activity.

If passive relocation is eventually allowed, a qualified biologist can passively exclude birds from their burrows during non-breeding season only by installing one-way doors in burrow entrances. These doors will be in place for 48 hours to ensure owls have left the burrow, and then the biologist will excavate the burrow to prevent reoccupation. Burrows will be excavated using hand tools. During excavation an escape route will be maintained at all times. This may include inserting an artificial structure into the burrow to avoid having the overburden collapse into the burrow and trapping owls inside. Other methods of passive relocation, based on best available science, may be approved by the Wildlife Agencies during Plan implementation.

Exceptions to Passive Relocation Prohibition

Due to the relatively low numbers of burrowing owls in the study area, it is not expected that the prohibition of passive relocation will result in project delays. However, it is possible that a covered activity could not proceed due to avoidance measures for burrowing owl in this condition if owls continually persist on a site where avoidance is not feasible. In such cases, a project proponent may apply for an exception based on the following process. For this condition, the term exception means an allowance to conduct passive relocation of burrowing owls during the non-breeding season only when this activity is not otherwise allowed. This exception process is necessary to allow reasonable use and development of a property based on the variety of constraints and factors that may affect the property. In situations where exceptions are granted, other portions of this condition may still apply. Exceptions will be used in a minority of cases with special circumstances that limit or restrict the ability of a landowner to fully apply the condition.

Exceptions may be requested through the standard application process described in Section 6.8, or through a separate request process. Private applicants must apply for a passive relocation exception through their local jurisdiction. Project proponents must develop and submit with the request for exception a passive relocation plan. The passive relocation plan must document the following.

1. That owls have occupied the site for a full year without relocating voluntarily. Surveys documenting presence must be completed by a qualified biologist and results must be provided in a written report. The report should confirm that one or more individuals (i.e., unique owl[s]) were monitored for a year and that the owl(s) had used the site for a full year[20].
2. The proposed process for relocation, including schedule for the proposed passive relocation and name of the qualified biologist.

The local jurisdiction, the Implementing Entity, and the Wildlife Agencies will meet to discuss the proposed passive relocation plan. Exceptions will be considered based on, but not limited to, the following factors:

1. The parcel is equal to or less than 3 acres and is more than 1,000 feet from other suitable nesting or foraging habitat such that it is unlikely the site can sustain burrowing owls into the future.
2. If the site has historically been used for nesting (within the last 3 years).
3. If the site is a target for a burrowing owl temporary or permanent management agreement.

As part of the review process, the Implementing Entity and Wildlife Agencies will consider the implications of an exception on the burrowing owl population and progress toward the biological goals and objective of the Plan. A passive relocation exception will not be granted if the Implementing Entity and Wildlife Agencies determine that such an exception, as mitigated, would preclude implementation of the conservation strategy of the Habitat Plan or conflict with other applicable requirements of the Habitat Plan and local policies. The local jurisdiction or the Implementing Entity must make written findings that document these considerations and the rationale for the exception.

Additional mitigation may be required as part of an approval to implement passive relocation that is otherwise prohibited by the Plan. The need for and form of additional mitigation will be determined and approved by the Implementing Entity and Wildlife Agencies. Additional mitigation could include payment of additional fees, or contribution of occupied lands to the Reserve System. Applicable fees may be imposed by the local jurisdiction for processing exception requests. Mitigation will be proportional to the impact occurring as a result of a specific eviction and will fully mitigate such evictions.

The Implementing Entity will compile a list of all exceptions granted each calendar year for inclusion in the annual report to the Wildlife Agencies.

[20] If monitoring reveals that an owl(s) has vacated the site for 10 consecutive days or more, the project applicant may assume that the owl has voluntarily relocated and a qualified biologist may take measures to collapse suitable habitat to discourage new owls from occupying the site.

Condition 16. Least Bell's Vireo

To avoid and minimize direct impacts of covered activities on least Bell's vireos, the following procedures will be implemented. These survey requirements provide compliance with the Plan and the MBTA (least Bell's vireo is a listed species, so the HCP permit also serves as a Special Purpose Permit under MBTA; see Chapter 1 for details).

Habitat Survey

Least Bell's vireo surveys will only be required for projects occurring within potential breeding habitat. The Implementing Entity will provide maps showing the geographic regions where surveys may be required. These maps will be updated during the permit term to incorporate best available science on where this species may be found. At the time of Plan adoption, the area of required surveys is limited to the Pajaro watershed, including Uvas, Llagas, and Pacheco sub-watersheds.

Projects occurring within the mapped area require surveys if the project-specific verified land cover map (see Section 6.8.3 *Item 3: Land Cover Types on Site*) shows that the project area is within 250 feet of riparian land cover types. If a project meets this criterion, a qualified biologist will conduct a field investigation to identify and map early successional riparian vegetation (typically dominated by willow shrubs and other thick understory vegetation) which may be used for nesting. If early successional riparian vegetation is found, the project proponent may revise the proposed project to avoid all areas within a 250-foot buffer around the potential nesting habitat and surveys will be concluded.

Preconstruction Survey

If the project proponent chooses not to avoid the potential nesting site and the 250-foot buffer, additional nesting surveys are required. Prior to any ground disturbance related to covered activities, a qualified biologist will:

1. Make his/her best effort to determine if there has been nesting at the site in the past 3 years. This includes checking the CNDDB, contacting local experts, and looking for evidence of historical nesting (i.e., old nests).
2. If no nesting in the past 3 years is evident, conduct a preconstruction survey in areas identified in the habitat survey as supporting potential least Bell's vireo nesting habitat. Surveys will be made at the appropriate times of year when nesting use is expected to occur. The surveys will document the presence or absence of nesting pairs of least Bell's vireo. Protocol-level surveys will be used (USFWS's 2001 least Bell's vireo survey guidelines or latest protocol). Surveys will conclude no more than two calendar days prior to construction.

To avoid last minute changes in schedule or contracting that may occur if an active nest is found, the project proponent may also conduct a preliminary survey up to 14 days before construction. If one or more least Bell's vireo nests are found present (through step 1 or 2 above), the nest site(s) plus a 250-foot buffer will be avoided (see below for additional avoidance and minimization details). The Wildlife Agencies will be notified immediately of nest locations.

Avoidance and Minimization

Covered activities must avoid active least Bell's vireo nests during the breeding season (March 15–July 31) by maintaining at least a 250-foot no-activity buffer around all active nests. As long as the nest remains active, no activity will occur within the established buffer. Disturbance to previous nesting sites (for up to 3 years) will also be avoided during the breeding season unless the disturbance is required for the conservation strategy or to maintain public safety. Least Bell's vireos use previous nesting sites, and disturbance during the breeding season may preclude birds from using existing nests.

The required buffer may be reduced in areas where there are sufficient barriers or topographic relief to protect the nest from excessive noise or other disturbance. Implementing Entity technical staff will coordinate with the Wildlife Agencies and evaluate exceptions to the minimum no-activity buffer distance on a case-by-case basis.

Construction Monitoring

If occupied nests are identified, a qualified biologist will monitor construction to ensure that the 250-foot no-activity buffer around all active least Bell's vireo nests is maintained to ensure that covered activities do not affect nest success. If monitoring indicates that construction outside of the buffer is affecting breeding, the buffer will be increased if space allows (e.g., move staging areas farther away). If space does not allow, construction will cease until the young have fledged from the nest or until the end of the breeding season, whichever occurs first. The biological monitor will also conduct training of construction personnel on the avoidance procedures, buffer zones, and protocols in the event that a least Bell's vireo flies into an active construction zone (i.e., outside the buffer zone).

Condition 17. Tricolored Blackbird

To avoid direct impacts of covered activities on nesting tricolored blackbird colonies, the following procedures will be implemented.

Habitat Survey

Projects require surveys if the project-specific verified land cover map (see Section 6.8.3 *Item 3: Land Cover Types on Site*) shows that the project area is within 250 feet of any riparian, coastal and valley freshwater marsh (perennial wetlands), or pond land cover types. If a project meets this criterion, a qualified biologist will conduct a field investigation to identify and map potential nesting substrate. Nesting substrate generally includes flooded, thorny, or spiny vegetation (e.g., cattails, bulrushes, willows, blackberries, thistles, or nettles). If potential nesting substrate is found, the project proponent may revise the proposed project to avoid all areas within a 250-foot buffer around the potential nesting habitat and surveys will be concluded.

Preconstruction Survey

If the project proponent chooses not to avoid the potential nesting habitat and the 250-foot buffer, additional nesting surveys are required. Prior to any ground disturbance related to covered activities, a qualified biologist will:

1. Make his/her best effort to determine if there has been nesting at the site in the past 5 years. This includes checking the CNDDB, contacting local experts, and looking for evidence of historical nesting (i.e., old nests).
2. If no nesting in the past 5 years is evident, conduct a preconstruction survey in areas identified in the habitat survey as supporting potential tricolored blackbird nesting habitat. Surveys will be made at the appropriate times of year when nesting use is expected to occur. The surveys will document the presence or absence of nesting colonies of tricolored blackbird. Surveys will conclude no more than two calendar days prior to construction.

To avoid last minute changes in schedule or contracting that may occur if an active nest is found, the project proponent may also conduct a preliminary survey up to 14 days before construction. If a tricolored blackbird nesting colony is present (through step 1 or 2 above), a 250-foot buffer will be applied from the outer edge of all hydric vegetation associated with the site and the site plus buffer will be avoided (see below for additional avoidance and minimization details). The Wildlife Agencies will be notified immediately of nest locations.

Avoidance and Minimization

Covered activities must avoid tricolored blackbird nesting habitat that is currently occupied or have been used in the past 5 years. If tricolored blackbird colonies are identified during the breeding season, covered activities will be prohibited within a 250-foot no-activity buffer zone around the outer edge of all hydric vegetation associated with the colony. This buffer may be reduced in areas with dense forest, buildings, or other habitat features between the construction activities and the active nest colony, or where there is sufficient topographic relief to protect the colony from excessive noise or visual disturbance.

Depending on site characteristics, the sensitivity of the colony, and surrounding land uses, the buffer zone may be increased. Land uses potentially affecting a colony will be observed by a qualified biologist to verify that the activity is not disrupting the colony. If it is, the buffer will be increased. Implementing Entity technical staff will coordinate with the Wildlife Agencies and evaluate exceptions to the minimum no-activity buffer distance on a case-by-case basis.

Construction Monitoring

If construction takes place during the breeding season when an active colony is present, a qualified biologist will monitor construction to ensure that the 250-foot buffer zone is enforced. If monitoring indicates that construction outside of the buffer is affecting a breeding colony, the buffer will be increased if space allows (e.g., move staging areas farther away). If space does not allow, construction will cease until the colony abandons the site or until the end of the breeding season, whichever occurs first. The biological monitor will also conduct training of construction personnel on the avoidance procedures, buffer zones, and protocols in the event that tricolored blackbirds fly into an active construction zone (i.e., outside the buffer zone).

Condition 18. San Joaquin Kit Fox

Disturbance of all San Joaquin kit fox dens will be avoided to the maximum extent possible. To avoid or minimize direct impacts of covered activities on San Joaquin kit fox, the following procedures will be implemented. This program was based on USFWS's *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox prior to or during Ground Disturbance* (U.S. Fish and Wildlife Service 2011).

Habitat Survey

San Joaquin kit fox surveys will only be required for projects occurring within modeled habitat (**Appendix D**). (This model will be updated as needed based on best available scientific information.) The Implementing Entity will provide updated modeled habitat maps to the County (the only jurisdiction in which these areas occur). A qualified biologist will conduct a field evaluation of suitable breeding or denning habitat for kit fox for all covered activities that occur within modeled habitat and map potential den sites. If the project does not fully avoid impacts on suitable dens, preconstruction surveys will be required. Suitable breeding habitat is fully avoided if the project footprint does not overlap with a suitable den or with a 250-foot buffer around the suitable den.

Preconstruction Survey

Prior to any ground disturbance related to covered activities, a qualified biologist will conduct a preconstruction survey for covered activities in areas identified by species surveys as being suitable breeding or denning habitat. The surveys will evaluate use of dens by kit foxes using methods appropriate for the northern edge of the species' range, such as placing a tracking medium in the project area where suitable dens occur. Surveys will conclude no more than two calendar days prior to construction. To avoid last minute changes in schedule or contracting that may occur if a kit fox or active den is found, the project proponent may also conduct a preliminary survey up to 14 days before construction. On the parcel where the activity is proposed, the biologist will survey the proposed disturbance footprint and a 250-foot radius from the perimeter of the proposed footprint to identify San Joaquin kit foxes and/or suitable dens. Adjacent parcels under different land ownership will not be surveyed unless access is granted within the 250-foot radius. The status of all dens will be determined and mapped. Written results of preconstruction surveys will be submitted to USFWS and CDFG within two calendar days after survey completion and before the start of ground disturbance.

If San Joaquin kit foxes and/or suitable dens (i.e., dens greater than 5 inches in diameter) are identified in the survey area, the conditions described below will be implemented.

Avoidance and Minimization

The goal of the avoidance and minimization measures for San Joaquin kit fox are to avoid all injury or death to kit fox in the study area, and to minimize harm or harassment to the species. No take authorization for injury or death to kit fox is provided by this Plan due to the rarity of the species in the study area. The following avoidance and minimization conditions will be applied to projects that do not fully avoid suitable dens or kit fox individuals.

- If a suitable San Joaquin kit fox den is discovered in the proposed development footprint, the den will be monitored for 3 days by a USFWS- and CDFG-approved biologist using a tracking medium or an infrared beam camera to determine if the den is currently being used.
- Unoccupied dens will be destroyed immediately to prevent subsequent use.
- If a natal or pupping den is found, USFWS and CDFG will be notified immediately. The den will not be destroyed until the pups and adults have vacated and then only after further consultation with USFWS and CDFG.
- If kit fox activity is observed at the den during the initial monitoring period, the den will be monitored for an additional 5 consecutive days from the time of the first observation to allow any resident animals to move to another den while den use is actively discouraged. For dens other than natal or pupping dens, use of the den can be discouraged by partially plugging the entrance with soil such that any resident animal can easily escape. Once the den is

determined to be unoccupied it may be excavated under the direction of the biologist. Alternatively, if the animal is still present after 5 or more consecutive days of plugging and monitoring, the den may have to be excavated by hand when, in the judgment of a biologist, it is temporarily vacant (i.e., during the animal's normal foraging activities). If at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above will be resumed. Destruction of the den may be completed when, in the judgment of the biologist, the animal has escaped from the partially destroyed den.

- Construction and on-going operational requirements from *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox prior to or during Ground Disturbance* (U.S. Fish and Wildlife Service 2011) or the latest guidelines will be implemented.
- If active or suitable dens are identified within the proposed disturbance footprint or outside the proposed project footprint but within a 250-foot buffer, exclusion zones around each den entrance or cluster of entrances will be demarcated. The configuration of exclusion zones will be circular, with a radius measured outward from the den entrance(s). No covered activities will occur within the exclusion zones. Exclusion zone radii for atypical dens and suitable dens will be at least 50 feet and will be demarcated with four to five flagged stakes. Exclusion zone radii for known dens will be at least 100 feet and will be demarcated with staking and flagging that encircles each den or cluster of dens but does not prevent access to the den by the foxes.

Construction Monitoring

If construction takes place while kit fox dens are occupied, a qualified biologist will be present to ensure compliance with the avoidance and minimization measures listed above. The frequency of monitoring will be approved by USFWS and CDFG and will be based on the frequency and intensity of construction activities and the likelihood of disturbance to the active dens. In most cases, monitoring will occur at least weekly, but in some cases daily monitoring may be appropriate to ensure that disturbance of San Joaquin kit fox is minimized.

6.6.2 Covered Plant Species

Impacts on covered plant occurrences are constrained by limits on the number of occurrences impacted, as described in Chapter 4 (see **Table 4-6**). Accordingly, only two additional conditions on covered activities is needed to meet regulatory requirements for covered plants.

Condition 19. Plant Salvage when Impacts are Unavoidable

Where impacts on covered plant species cannot be avoided and plants will be removed by approved covered activities, the Implementing Entity has the option of salvaging the covered plants. Salvage of covered plants is conducted in addition to mitigation that may be required for impacts on covered plants.

Plant salvage as mitigation is acknowledged as a technique that rarely succeeds; it is opposed by conservation organizations as a primary mitigation tool (Howald 1996; California Native Plant Society 1998). Therefore, the Implementing Entity must carefully weigh the expected costs and potential benefits of the salvage effort before undertaking it. Salvage guidelines are presented below for all covered plants, for perennial species, and for annual species.

All Covered Plants

All salvage operations will be conducted by the Implementing Entity or a third party contractor approved by the Implementing Entity. Translocation activities will be reviewed and approved by the Wildlife Agencies in advance of translocation activities occurring. Translocated plants should be moved during their dormant season in order to minimize impacts to individuals. To ensure enough time to plan salvage operations, project proponents will notify the Implementing Entity of their schedule for removing the covered plant occurrence.

The Implementing Entity may conduct investigations into the efficacy of salvaging seeds from the soil seed bank for both perennial and annual species. The soil seed bank may add to the genetic variability of the occurrence. Covered species may be separated from the soil though garden/greenhouse germination or other appropriate means. Some topsoil taken from impact sites may also be moved to the transplant site in the reserve to introduce soil microorganisms.

The Implementing Entity will transplant new occurrences such that they constitute separate populations and do not become part of an existing population of the species, as measured by the potential for genetic exchange among individuals through pollen or propagule (e.g., seed, fruit) dispersal. Transplanting or seeding *receptor* sites (i.e., habitat suitable for establishing a new population) will be carefully selected on the basis of physical, biological, and logistical considerations (Fiedler and Laven 1996); some examples of these are listed below.

- Historic range of the species.
- Soil type.
- Soil moisture.
- Topographic position, including slope and aspect.

- Site hydrology.
- Mycorrhizal associates.
- Presence or absence of typical associated plant species.
- Presence or absence of herbivores or plant competitors.
- Site accessibility for establishment, monitoring, and protection from trampling by cattle or trail users.

Perennial Covered Plants

Salvage methods for perennial species will be tested for whole individuals, cuttings, and seeds. Salvage measures will include the evaluation of techniques for transplanting as well as germinating seed in garden or greenhouse and then transplanting to suitable habitat sites in the field. Techniques will be tested for each species, and appropriate methods will be identified through research and adaptive management. Where plants are transplanted or seeds distributed to the field, they will be located in reserves in suitable habitat to establish new populations. Field trials will be conducted to evaluate the efficacy of different methods and determine the best methods to establish new populations. Transplanting within the reserves will only minimally disturb existing native vegetation and soils. Supplemental watering may be provided as necessary to increase the chances of successful establishment, but must be removed following initial population establishment. Supplemental watering will include watering throughout first growing season to mimic natural rainfall patterns. During establishment, areas will be fenced off as necessary to prevent trampling or grazing by livestock. These areas will not be selected for controlled burns. Once the population has established itself, as determined by success criteria that may include setting seed, 3-year survival, or other criteria developed in agreement with the Wildlife Agencies, then fencing and irrigation will be removed and the site may be burned for management purposes if that is appropriate for the target plant.

Annual Covered Plants

For annual covered plants, mature seeds will be collected from all individuals for which impacts cannot be avoided (or if the population is large, a representative sample of individuals). If storage is necessary, seed storage studies will be conducted to determine the best storage techniques for each species. A seed storage facility will also be contacted and consulted regarding collecting and storage requirements of the facility. One of the leading seed banks in California is the Rancho Santa Ana Botanic Garden in Claremont, CA (Rancho Santa Ana Botanic Garden 2010). This facility has strict seed collection and storage guidelines available on its website (http://www.rsabg.org).

If needed, studies will be conducted on seeds germinated and plants grown to maturity in garden or greenhouse to propagate larger numbers of seed. Such studies can be contracted with research institutions such as the Rancho Santa Ana Botanic Garden, or carried out by other qualified biologists. Seed propagation methods will ensure that genetic variation is not substantially affected by propagation (i.e., selection for plants best adapted to cultivated conditions). Field studies will be conducted under the Adaptive Management Program to determine the efficacy and best approach for dispersal of seed into suitable habitat. Where seeds are distributed to the field, they will be located in reserves in suitable habitat to establish new populations. If seed collection methods fail (e.g., due to excessive seed predation by insects), alternative propagation techniques will be necessary.

Condition 20. Avoid and Minimize Impacts to Covered Plant Occurrences

Almost all known occurrences of covered plants in the study area are outside the planning limits of urban growth and outside the footprint of covered activities. Many of these occurrences are expected to be included in the Reserve System. However, uncertainty remains regarding impacts on covered plants because of the lack of surveys in many areas, the general nature of some plant occurrence data, and the uncertainty in the location of some covered activities. To account for this uncertainty, impacts on covered plants are tracked by occurrence[21], as described in Chapter 4. To ensure compliance with the requirements in Chapter 5, surveys for covered plants will be conducted in certain areas in order to 1) identify occurrences of covered plants, and 2) assess the condition of these occurrences.

Covered Plant Surveys

To ensure that plants are adequately conserved relative to impacts of covered activities, plant surveys will identify occurrences of covered plants that may be affected by covered activities (see Section 5.3.1 *Land Acquisition and Restoration Actions* subheading *Incorporating Covered Plant Species*). Surveys are required in locations where covered plant occurrences are most likely to occur. Covered plant surveys will be required in the following land cover types and specific habitats. The plant species for which surveys are required are also indicated. These land cover types and habitats were identified because the majority of covered species occur primarily or exclusively in serpentine land cover types.

- Serpentine bunchgrass grassland: Survey for smooth lessingia, fragrant fritillary, Metcalf canyon jewelflower, most beautiful jewelflower, Tiburon paintbrush, and Coyote ceanothus.

[21] Occurrence can be synonymous with population for some species. However, some plant species may have several occurrences in one population. Definitions of plant populations will be developed for covered plants during implementation.

- Serpentine rock outcrop: Survey for Santa Clara Valley dudleya, smooth lessingia, Metcalf canyon jewelflower, most beautiful jewelflower, and Tiburon paintbrush.
- Serpentine seep: Survey for Mount Hamilton thistle.
- Mixed serpentine chaparral: Survey for Coyote ceanothus and most beautiful jewelflower.
- Mixed oak woodland and forest with serpentine soils: Survey for Loma Prieta hoita.
- Coast live oak forest and woodland with serpentine soils: Survey for Loma Prieta hoita.
- Northern coastal scrub and Diablan sage scrub with serpentine soils: Survey for Coyote ceanothus, Metcalf canyon jewelflower, most beautiful jewelflower, and smooth lessingia.

Plant surveys will also be required in suitable habitat within a 0.25 mile (1,320 feet) radius of a known occurrence of a covered plant to ensure that known occurrences are located (in most cases, these survey areas will overlap with the land cover types listed above). The Implementing Entity will maintain a map of known occurrences and the survey radius around each one based on this Plan and updates provided by the CNDDB (every six months) for the study area.

These surveys will be performed according to the current applicable guidelines of CDFG and/or USFWS for plant surveys (if available) except no floristic surveys are required. The appropriate survey period for each covered plant species is described in **Table 6-9**[22]. Surveys must be conducted at the time of year when the species can be identified in the field. In some cases, plants may be identifiable outside of the flowering period (e.g., Mount Hamilton thistle, Coyote ceanothus).

Inside the urban service area, surveys for covered plants will occur in land cover types and habitats listed above within the area on which the land cover fee will be levied and in any other areas where indirect effects could occur. The survey area must include buffers around structure where required vegetation clearing will occur to meet state and local fuel reduction regulations.

If a covered plant occurrence is observed on site, the condition of this occurrence must be described in the application package according to the guidelines in Chapter 5, Section 5.3.1 *Land Acquisition and Restoration Activities* subheading *Incorporating Covered Plant Species*. The condition of each covered plant occurrence must be documented as a baseline to compare future monitoring (if necessary) and to ensure that occurrences are protected within the Reserve System that are in as good or better condition than those lost to covered activities.

[22] These survey periods should be used as a guide only. Some plants can be readily identified by qualified botanists outside of the species' blooming period.

If a covered plant occurrence is found on the project site, the local jurisdiction will obtain the opinion of a qualified biologist regarding the projected long-term viability of a covered plant occurrence given the plant occurrence condition, site conditions, and project-level construction details. The qualified biologist will make this determination based on best available scientific information. In cases where it is difficult to project long-term viability, the qualified biologist will conservatively error in favor of the covered plant and assume that long-term viability will be reduced and the occurrence will be considered lost for tracking purposes. Impacts to covered plants will be avoided or minimized wherever possible by implementing the following conditions.

Avoidance and Minimization

In order to reduce impacts to covered plants, all covered activities will be confined to the minimum area necessary to complete the activity or construction. A setback buffer will be established around covered plant occurrences located on any project site or in an adjacent area that could be affected by construction traffic or activities. The setback buffer will be adequate to prevent or minimize impacts during or after project implementation. The plants and buffer area will be protected from encroachment and damage during construction by installing temporary construction fencing. Fencing will be bright-colored and highly visible. Fencing will be designed to keep construction equipment away from plants and prevent unnecessary damage to or loss of plants on the project site. Fencing will be installed under the supervision of a qualified biologist to ensure proper location and prevent damage to plants during installation. Fencing will be installed before any site preparation or construction work begins and will remain in place for the duration of construction. Construction personnel will be prohibited from entering these areas (the exclusion zone) for the duration of project construction.

Site Monitoring, Assessment, and Management

If a qualified biologist determines that the long-term viability of a covered plant occurrence will be reduced (as described below) by implementation of covered activities, the loss must be offset by protection, management, and monitoring of covered plant occurrences in the Reserve System prior to impacts (**Table 5-16**).

Some covered plant occurrences may only be disturbed or partially affected by covered activities, and viability may be maintained. It is important to monitor and, if possible, maintain these occurrences of covered plants where they occur, even if they are not protected within the Reserve System. Covered plant occurrences that are determined to be partially permanently affected by a qualified biologist (i.e., only a portion of the occurrence is impacted) by covered activities will be monitored by the Implementing Entity. The purpose of the monitoring will be 1) to assess whether the impact reduces the long-term viability of the occurrence and whether supplemental management actions are feasible and warranted, and 2) to determine whether the Implementing Entity must protect and enhance or create[23] occurrences in the Reserve System according to **Table 5-16**. If the impact occurs to less than 5% of the total occurrence as measured by the number of individuals at the time of impact, then the impact is assumed not to affect long-term viability and will not require monitoring nor will it count as a permanent impact (**Table 4-6**). This allowance does not apply to Coyote ceanothus.

When determining viability for the purpose of assessing a partial or permanent impact, the Implementing Entity will consider the following factors.

1. Results of monitoring plant occurrences affected by covered activities (e.g., correlation between pre-project observations and actual viability post-project).
2. Impacts to date to the covered plant species and how close total impacts are to the allowable impact cap in the Plan (e.g., extra care taken when near cap not to exceed the cap).

Specific monitoring protocols and success criteria will be developed during implementation as appropriate for each covered species, according to the guidelines discussed here. Monitoring protocols can draw on those developed for other HCP/NCCPs. It is possible that only a portion of the occurrence will be located on the covered activity project site. In such instances, the monitoring protocol will address this issue. Three possible approaches include the following.

1. If the landowner agrees, the Implementing Entity will obtain access to the adjacent sites on which the rest of the plant occurrence is located, and surveys will include the entire occurrence.
2. If access to adjacent site(s) is not possible, or if for some other reason it is not feasible to survey the entire occurrence, then an alternative will be developed to estimate the extent and condition of the adjacent portion of the occurrence.
3. If only a small portion of the occurrence is on adjacent properties, then only the portion of the occurrence on the project site will be monitored and assessed for viability. The determination whether this is a full impact will be made based on the results for this portion of the occurrence only.

Population monitoring will be conducted by the Implementing Entity before the covered activity is implemented to document the baseline condition. For annual species, the minimum post-construction monitoring period will be 5 years. If extreme or unusual climate conditions affect the species, then monitoring will be extended 1 or 2 years, as appropriate to assess impacts and success. Monitoring will include estimates of percent cover and number of individuals. An occurrence will be assumed to retain long-term viability and will not require replacement in the Reserve System if the decline in occurrence size and percent cover from pre-project conditions is less than 25% over the monitoring period,

[23] Creation is only allowed to mitigate effects for Coyote ceanothus. All other plant occurrence creation would contribute to recovery (**Table 5-16**).

unless site-specific conditions otherwise suggest substantial declines in occurrence viability.

For perennial species, the minimum post-construction monitoring period will be 3 years. Monitoring will include estimates of density (percent cover), recruitment of seedlings if impacts included removing individuals, and measurements of adult plant health (e.g., signs of disease, herbivory, nutrient deficiencies, etc.). An occurrence of a perennial covered species will be assumed to retain long-term viability and will not require replacement in the reserve system if the decline in seedling recruitment and density from pre-project conditions is less than 25% over the monitoring period, unless site-specific conditions otherwise suggest substantial declines in occurrence viability.

The Implementing Entity will implement conservation actions on the site that would help to maintain or improve the condition of the occurrence, as long as an agreement can be reached with the landowner to conduct these measures. Possible conservation measures are described in Chapter 5. If plant occurrences are determined to not be viable based on post-project monitoring, the Implementing Entity must assess the loss as a full permanent impact and implement conservation actions accordingly. In these cases, mitigation would occur after the impact. However, the potential for mitigation to occur after impacts is unlikely given that the qualified biologist and Implementing Entity will make conservative determinations regarding projected impacts on long-term viability.

6.7 Receiving Take Authorization under the Plan

Take authorization will be provided by the Plan to three broad categories of covered activities: public projects proposed by the Permittees, private projects under the jurisdiction of the Permittees, and public projects by non-Permittees in the study area that are approved for inclusion by the Implementing Entity. Each of these situations is explained below.

6.7.1 Evaluation Process for Permittee Projects

The Plan permits provide the Permittees with take authorization along with the authority to approve covered activities complying with the terms of the Plan. If a Permittee undertakes a covered activity (see Chapter 2), the Permittee must document compliance with the Habitat Plan and provide a copy of this documentation to the Implementing Entity for tracking purposes (i.e., to track the amount of take coverage granted) before the Permittee take authorization may be used. As described in Chapter 8, the Permittees will develop a template Habitat Plan application package for use by private applicants and Permittees that includes all items described in this section prior to permit issuance. It is expected that the documentation will be similar to the *Habitat Plan application package* required of private project proponents[24] applying to local jurisdictions for coverage (this application package is described in detail in Section 6.8 *Habitat Plan Application Package*, below).

Review and CEQA for Permittee Projects

Many covered activities are expected to be subject to CEQA[25]. When Permittees initiate projects that are also subject to CEQA, the terms of the Habitat Plan should generally be integrated into the CEQA environmental review process. To facilitate CEQA coordination, the Permittee should begin preparation of the Habitat Plan application package (or equivalent material) when the CEQA project description and alternatives for the project are developed such that requirements of the Habitat Plan can be used to inform site design and selection of the preferred alternative. The completed Habitat Plan documentation should be evaluated and approved by the appropriate CEQA lead agency of the Permittee concurrently with the lead agency's review of the associated CEQA documents. Projects exempt from CEQA may still be covered activities under this Plan and require compliance with the conditions of this Plan as described in this chapter.

Receiving Take Authorization for Permittee Projects

Incidental take associated with covered activities carried out by the Permittees is authorized under the permits issued for the Habitat Plan. These projects are therefore "pre-approved" for take authorization by the Wildlife Agencies as long as their effects were adequately analyzed, they meet the conditions of the Plan, and they pay the appropriate fees, if applicable. Each Permittee is responsible for ensuring that its covered activity is compliant with the conditions of approval described in this chapter. Take authorization will be in effect once the Permittee documents consistency with the Habitat Plan. The form developed by the Implementing Entity to document the consistency of private development with the Plan may also be used by Permittees for their own projects. Documentation of Plan consistency and a complete Habitat Plan application package must be submitted to the Implementing Entity for tracking purposes. The process for receiving take authorization under the Plan for public projects of the Permittees is shown in **Figure 6-5**.

[24] The term *project proponent* is used interchangeably with the term *applicant* or *project applicant* in this and subsequent chapters.

[25] Permittee covered activities that may not be subject to CEQA include operations and maintenance activities and projects that only require ministerial approval within local jurisdictions such as single family home construction.

6.7.2 Application Process for Private Projects

Private applicants seeking coverage under the Habitat Plan, including applicants that wish to opt in to the Plan[26], will apply to their local jurisdiction by submitting a *Habitat Plan application package* described in Section 6.8 *Habitat Plan Application Package*. A checklist for evaluating these applications will be developed by the Implementing Entity prior to the first ordinance implementing the Plan taking effect. The local jurisdiction will review the Habitat Plan application package for completeness in accordance with the checklist. For requests to opt in, the local jurisdiction will also evaluate the amount of take requested (i.e., acres of impacts) and whether or not take coverage is available for the project. If the application package is not complete, it will be returned to the project proponent with an explanation of why it is incomplete. If the application package is complete, the local jurisdiction will calculate the required fees on the basis of the requirements described in Chapter 9 and consistent with the local ordinance implementing the Plan. The determination of completeness of the application package rests with the local jurisdiction. If they choose, local jurisdictions may request technical assistance from the Implementing Entity staff in their review.

All applicable conditions will be identified and fees paid at (or before) the time of issuance of the first authorization of ground disturbance (typically a grading permit or building permit). In cases where there is no grading or other ground disturbance permit, the fees will be due upon issuance of the first permit that authorizes construction. If the project proponent requests to contribute land in lieu of fees or requests special project conditions, such requests must be reviewed and approved by the Implementing Entity. See Chapter 8, Section 8.2.1 *Permittees* for Permittees that may grant take authorization and Section 8.7 *Roles and responsibilities in Reviewing Applications for Take Authorization* for additional detail on application review.

The process for receiving take authorization for private projects is shown in **Figure 6-6**. Local agencies reviewing the Plan application package will be subject to the processing time and other requirements of the Permit Streamlining Act (Section 65920 et seq.) which requires public agencies to follow standardized time limits and procedures when making specific types of land use decisions.

Application Review and CEQA for Private Projects

Many private covered activities will require a land use approval and be subject to CEQA. For such covered activities, review of applications for take authorization should generally be undertaken concurrently with the CEQA environmental review. To facilitate this approach, the local jurisdiction should generally request

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[26] Private parties that are not subject to the Plan (see **Figure 2-5**) have the option to request coverage under the Plan from the applicable local jurisdiction.

that project proponents submit initial Habitat Plan application package information as part of the land use approval application and CEQA process.

There are many benefits to drafting the Habitat Plan application early in the planning process. First, submitting initial Plan application package information during the land use approval / CEQA process will illustrate the various requirements of the Habitat Plan on the proposed project, and provide time for the project proponent to change the project description or to identify alternatives for CEQA analysis. Second, it will enable the CEQA document to refer to the project-specific requirements as identified in the draft Plan application. Finally, it will enable the local jurisdiction to provide early review of the Plan application for completeness. Based on a review of this initial information and a determination of the Habitat Plan requirements, the local jurisdiction can establish conditions of approval specifying the Habitat Plan conditions and fee requirements. Habitat Plan fees will need to be paid prior to the issuance of construction permits (grading / building permits).

Each local jurisdiction is responsible for ensuring that covered activities, upon issuance of take, fully comply with the terms of the Habitat Plan.

Granting Take Authorization for Private Projects

Proponents of private projects that are covered by the Plan and not exempt (see Section 6.2 *Exemptions from Conditions*) must have their projects conditioned by the local jurisdiction obligating compliance with all terms and conditions of the Implementing Agreement, the Plan, and the state and federal permits that apply to the project prior to the local jurisdiction issuing take authorization. Such terms and conditions include, but are not limited to, those listed below.

- Compliance with all relevant avoidance, minimization, surveys, monitoring, and conservation measures determined by the local jurisdiction to apply to the project as required by the Plan.
- The right for the Permittee to monitor the applicant’s compliance with all applicable conditions of this Plan.
- Imposition of a fee or dedication of land in lieu of the fee as described in Chapter 9 and in the local Implementing Ordinance.

Before take authorization is granted, Permittees must prepare a written determination of the project’s consistency with the Plan. A template form for private applicants that documents this determination of consistency will be developed by the Implementing Entity prior to the first local ordinance taking effect (this consistency determination will be made based on the application checklist described above).

Once the Habitat Plan application package is deemed complete, the conditions of approval have been established and imposed, and the required fees (if applicable) have been paid, the project proponent will be granted take authorization by the appropriate Permittee (see Chapter 9 for required fees and payment times). At this point, the project proponent will be allowed to proceed with the project consistent with other applicable local, state, and federal laws and local entitlements. Take authorization for impacts on covered species will be provided by the applicable Permittee consistent with the state and federal permits issued to all Permittees. Each local jurisdiction, working with the Implementing Entity will develop a process to document projects that receive take authorization but do not proceed with the project to have the take authorization removed from the Implementing Entity's records.

When Habitat Plan application packages are completed, each Permittee must provide a copy of the application material to the Implementing Entity for entry into the Habitat Plan database (described in Chapter 8 *Plan Implementation*).

6.7.3 Application Process for Non-Permittee Public Projects

Because the list and evaluation of covered activities in Chapter 2 is meant to be comprehensive, the Plan has included some projects that will be proposed by public entities that are not Permittees. For example, a special district or local school district may propose to build a project in one of the three participating cities or the unincorporated County. Although the special district or school district is not subject to the land use jurisdiction of the participating jurisdictions, the impacts of its project have been covered by the Plan and evaluated as part of the planned urban development within the jurisdiction. To receive coverage under the Plan, projects proposed by an entity that is neither a Permittee nor subject to the land use authority of a Permittee, the project proponent must apply directly to the Implementing Entity as a *Participating Special Entity*. The entity will provide the same Habitat Plan application package as private entities seeking coverage. See Chapter 8, Section 8.4 *Participating Special Entities*, for more details on the process by which Participating Special Entities receive take authorization under the Plan.

6.8 Habitat Plan Application Package

Private projects that are covered by the Plan must submit a *Habitat Plan application package* to the local jurisdiction for review and approval in order to receive coverage under the Habitat Plan. For their own projects, Permittees must submit an application package to the Implementing Entity for tracking purposes and pay the appropriate fees if applicable. The project proponent is responsible for preparing the application package and paying for any necessary field surveys, if required. The application package must contain the following items, if applicable, each of which is described in detail in this section.

- Item 1: An application form for coverage under the Plan.

- Item 2: A brief description and map of the project.
- Item 3: Documentation of land cover types on site.
- Item 4: Map of wetlands and waters, if applicable.
- Item 5: Results of applicable surveys for selected covered species.
- Item 6: Documentation of any additional and applicable avoidance and minimization requirements that will be implemented.

Each item in the application package builds on the previous item. For example, surveys for certain covered wildlife and plants (Item 5) are required only if specific land cover types are documented on the site (Items 3 and 4). Many covered activities will be able to comply with the Habitat Plan by only completing Items 1, 2, and 3 of the application package. For others, field surveys are limited to only the highest-value biological resources.

Most components of the application package can be prepared by the applicant, with the assistance of local planning staff. In some cases, the Plan requires that components be prepared or surveys or monitoring be conducted by *qualified biologist*. Please see *Qualified Biologists* below for details on the qualification process.

Templates for all these application components will be provided by the Implementing Entity to each local jurisdiction prior to the first local ordinance taking effect. These templates will also be posted on the Habitat Plan web site for use by private applicants and their consultants. Use of the templates will streamline the review and approval process by local jurisdictions. The Permittees may adjust the required components of the application package over time, consistent with the requirements of the Plan. To recover the costs of reviewing and processing these application packages, local jurisdictions may charge a fee associated with the application (see Chapter 9 for details).

The Habitat Plan application package, survey requirements, and conditions of approval were designed with the following principles in mind.

- Provide the necessary data to track impacts of all covered activities to allow the Implementing Entity to meet Plan requirements (e.g., land acquisition, Stay-Ahead provisions, wetland restoration).
- Simplify and reduce pre-project survey requirements relative to current and future environmental regulations throughout the Habitat Plan.
- Avoid and minimize impacts on covered species and natural land cover types to the maximum extent practicable on a regional scale, in compliance with federal and state endangered species laws.
- Ensure that survey requirements are proportional to impacts—the survey burden is lower on low-quality habitat than on high-quality habitat.
- When possible, limit survey requirements under the Plan to those required for other local, state, or federal environmental compliance (e.g., CEQA or

NEPA), and redirect resources previously spent on biological surveys to improve regional conservation.

Each of the required application components is described below.

6.8.1 Item 1: Project Application Form

The project application form will contain basic information about the project. The Implementing Entity will develop a form prior to issuance of the state and federal Plan permits that will be made available to the Permittees. Required forms will be available through the local jurisdictions and on the Habitat Plan website.

6.8.2 Item 2: Project Description and Map

The application package will include a brief project description including the location, assessor's parcel number, construction activity or maintenance methods, a description of the nature of the impacts (permanent or temporary), and timing (including duration) of the project or activity. The project description will be sufficient to document that it is a covered activity in the Plan (see Chapter 2). A legible vicinity map of the project site will also be provided to document that the project is within the Habitat Plan study area. A vicinity map will include any streams or water bodies that fall within the mapped area. If the project is located in Fee Zone A or B, but the project applicant believes that the project qualifies for Fee Zone C, the project applicant must demonstrate compliance with the criteria provided in Chapter 9, Section 9.4.1 *Habitat Plan Development Fees*, subheading *Land Cover Fee Zones*. A project detail map will be included that shows the area on which fees will be levied, as well as the full project parcel if inside the urban service area or the full development area if outside the urban service area, and any relevant landforms, roads, water bodies, and existing and proposed structures that will be affected by the proposed project.

6.8.3 Item 3: Land Cover Types on Site

As described in Chapter 3 *Physical and Biological Resources* a detailed land cover map was developed for the study area for this Plan. This land cover map was essential in estimating impacts of the covered activities (Chapter 4) and developing the conservation strategy (Chapter 5). However, due to limitations in the land cover mapping (see **Table 3-4**) and the potential for land cover to change over time, land cover types must be verified at the time applications are submitted. This step is also critical because almost all impacts under the Plan are tracked by land cover type.

Proponents of all projects and activities with quantifiable impacts, including approved Participating Special Entities, will specify the amount and type of land cover that will be permanently and temporarily impacted. All fees are paid on the development area (see **Figure 6-1**) except for land inside the urban service area designated with a land use of Urban Development or Rural Residential (see **Figure 2-2**) that is less than 10 acres, where fees are assessed on the parcel. In addition, all public corridor projects (e.g., stream and utility) pay fees based on the project footprint, regardless of parcel size. As described in Condition 12, projects that do not completely avoid indirect effects to wetlands (including wetlands on parcels adjacent to the covered activity development area) will be considered permanently impacted and will count towards the impact caps described in **Table 4-2** and will be assessed fees as described in Chapter 9.

Project proponents of activities that have temporary impacts are required to provide photographs that document the condition of the project site before the activity is implemented. These photographs will be compared to those required for post-project conditions (see Item 6) to determine if impacts were temporary and that appropriate fees were paid.

All calculations and other information provided in application packages will be verified by the local jurisdiction or Implementing Entity so that all impacts to land cover types can be tracked appropriately and fees paid. This exercise can be performed through air-photo analysis or field verification. Project proponents may request assistance from local planning staff in this analysis (for exempt projects, local jurisdictions will document land cover types present). For sites outside urban or suburban areas that support natural land cover types, land cover verification may need to be performed by a qualified biologist. Land cover type classification will be done in accordance with the descriptions provided in Section 3.3.5 *Natural Communities and Land Cover Types*. If the project site supports or may support any wetland or stream land cover types that would be affected by the proposed project, a qualified biologist must be retained (see Item 4 below).

All land cover determinations provided by private applicants will be verified by local planning staff. All land cover determinations provided by a Permittee will be verified by Implementing Entity staff. A private applicant or Permittee may retain Implementing Entity staff (at cost) to conduct this land cover mapping. Local jurisdiction staff may also be available to provide this service to private applicants as part of the application review process.

Land cover mapping of sites with the following land cover types, as mapped by the Plan, can be conducted by the applicant or local planning staff.

- California annual grassland[27];
- reservoirs;

[27] See definition of annual grassland in Chapter 3. When trees are present in annual grassland at low density, the land cover may instead be oak woodland. In these cases, a qualified professional is needed to make the determination.

- all agricultural land cover types; and
- all development land cover types.

Additions to existing development encompassing an area of 10,000 square feet (approximately 0.2 acre) or less on any land cover type, other than stream, riparian, serpentine, pond, or wetland land cover types, do not require land cover mapping by a qualified biologist or other professional. These projects may be mapped based on aerial photos by planners or applicants.

All other land cover types must be mapped by a qualified biologist. Forest land cover types can also be mapped by a professional forester or arborist. Accurate mapping of the remaining land cover types is necessary because of the Implementing Entity's obligation to stay ahead of impacts by land cover type and to ensure the appropriate species surveys are conducted. The Implementing Entity will provide a list of qualified biologists to conduct land cover mapping and other surveys required by the Habitat Plan. The Implementing Entity may also provide a list of qualified professionals (e.g., non-biologists such as foresters and arborists) to conduct land cover mapping. Biologists and other professionals qualified to conduct land cover mapping will have demonstrated experience conducting vegetation mapping in the field or from air photos at the scale of the proposed project and in vegetation types similar to those on the project site. This list will be updated regularly and made available to project proponents and the Permittees. Biologists conducting species surveys that could result in take must also be pre-approved by USFWS and CDFG (see Item 5 below).

Land cover mapping is not required for operations and maintenance activities conducted by Permittees except where serpentine land cover will be impacted (land cover mapping is required for all private applicants and Participating Special Entity projects). However, Permittees must still implement all applicable conditions including plant surveys. As such, some projects with operations and maintenance covered activities may require land cover mapping to determine applicable conditions. If no land cover mapping is conducted, Permittees will rely on the most recent land cover map developed by the Implementing Entity to quantify impacts.

For covered activities that result in temporary impacts, in lieu of aerial photo or field-verified land cover mapping, applicants have the option of assuming that the entire footprint of the covered activity permanently affects natural land cover types based on the Plan's most recent land cover map (and therefore pays a fee on these impacts as described in Chapter 9). This option is available for temporary impacts because the footprint of many of these activities is expected to be relatively small. If the land cover types assumed to be permanently impacted include those land cover types that trigger covered species surveys, then covered species surveys must be conducted.

The application package must include a map showing all land cover types on the project parcel(s) if the project is located inside the urban service area or within the development area if the project is outside the urban service area, and a table showing the amount of each land cover type to the nearest 0.1 acre for all nonstream land covers or linear foot for streams (blank tables will be provided in the template application package). These final values will be used to calculate any required fees (Chapter 9).

Table 6-8 describes land cover types and habitat elements that, when present, trigger the need for preconstruction surveys for five covered wildlife species. For example, if a project is located within occupied nesting habitat modeled for burrowing owls, a qualified biologist would need to conduct a habitat survey and possibly a pre-construction survey to map any burrows within 250 feet of the activity footprint. In some cases, presence of the habitat feature itself, regardless of land cover, may trigger additional survey requirements (**Table 6-8**).

The presence of certain land cover types on site may also trigger the need to survey for specific covered plants, as described in Item 5 below.

6.8.4 Item 4: Map of Wetlands, Ponds, Streams, and Riparian Woodlands

A map of all coastal and valley freshwater marsh, seasonal wetlands, ponds, riparian woodland, and streams is required for any project subject to the Habitat Plan that may directly or indirectly affect these aquatic land cover types.

Although Section 404 Clean Water Act wetland delineations are a tool that can be employed, jurisdictional delineations completed to meet the requirements of Section 404 do not necessarily account for all aquatic habitat for species proposed for coverage under this Plan (e.g., they do not address waters of the state that are not also waters of the U.S.). The Implementing Entity will use the wetland and waters map[28] developed for Item 4 of the application package to track impacts to coastal and valley freshwater marsh, seasonal wetlands, ponds, riparian woodland, and streams and to determine the wetland fee owed (see Chapter 9, Section 9.4.1, subheading *Wetland Mitigation Fee* and **Table 9-6**). Fees on wetlands, ponds, and riparian woodland will be determined by the acres of impact (see Condition 12 above and Chapter 9). Stream fees and impacts will be determined by the linear feet of stream affected, measured at the stream centerline.

Project proponents will not need to provide Item 4 of the application package if the Implementing Entity or permitting local jurisdiction determines that aquatic features will not be directly or indirectly affected by covered activities.

Formal delineations are typically required to identify waters of the U.S. and support compliance with Section 404 of the Clean Water Act. Maps of non-jurisdictional aquatic features are typically required to identify waters of the state

[28] Although delineations can be conducted any time of the year, they will be based on an evaluation of multiple factors by a qualified biologist, including but not limited to, hydrology, vegetation, and soils. Wetland features do not need to be holding water at the time of the field investigation to be delineated.

and support compliance with the Porter-Cologne Water Quality Control Act and Section 1602 of the California Fish and Game Code.

Project proponents are encouraged to produce maps for Item 4 that support other necessary state or federal permitting needs, but maps do not need to be verified by the Corps or Regional Boards prior to submission of the application package. If the Habitat Plan application will also meet the application requirements of the Habitat Plan RGP, once such a permit is in place, the delineation method must be consistent with Corps's delineation protocol. Such delineations may be verified by the Corps prior to application submittal, or delineations may be verified by the Corps as part of application processing once the application is submitted.

If a process for permitting projects affecting waters of the U.S. and/or waters of the state is not provided by local jurisdictions or the Implementing Entity in conjunction with the Plan, proponents of projects that could affect such resources must seek such permits on their own. In such cases, this Plan does provide the framework for CESA and ESA compliance for covered activities that would result in impacts on state or federal wetlands and waters.

6.8.5 Item 5: Results of Applicable Species Surveys and Monitoring

As described in Item 3, the presence of certain land cover types on the project site triggers an evaluation of whether specific habitat elements for selected wildlife species or for occurrences of covered plants. **Figure 6-7** summarizes these triggers and survey process. Survey requirements for these selected wildlife species are based on avoiding take of individual species—particularly animals with lower reproductive outputs (e.g., western burrowing owl) than other species (e.g., fish and amphibians). If suitable breeding habitat of these selected wildlife species is found, preconstruction surveys are triggered (see Conditions 15–18). If the preconstruction survey identifies occupied breeding habitat, project proponents must implement defined avoidance and minimization measures to avoid the resource during breeding seasons. Compliance during construction will be monitored by a qualified biologist.

As described below in this section under *Surveys for Covered Plants*, covered plant surveys will be required for specified land cover types. If an occurrence of a covered plant is present on the site, additional field assessment is required to document the occurrence's condition.

The purpose of these surveys is to comply with the avoidance and minimization requirements of ESA and CESA. If surveys are planned far enough in advance (typically 6–8 months), it is expected that in most cases identification of selected occupied habitat will not change the project design or schedule. These survey requirements and avoidance measures are designed to avoid or minimize take of individuals (as required by law), to document key resources for tracking purposes, and to ensure that impacts on plant occurrences are properly mitigated by the Implementing Entity.

Although surveys are required in specific cases, overall, impacts on covered species are assumed to occur on all project sites. However, if the results of the preconstruction survey documents a large or important population of a covered species other than those acknowledged in the Plan, the local agency reviewing or proposing the project must consult the Implementing Entity for advice on species avoidance and minimization measures[29]. The Implementing Entity will also contact the Wildlife Agencies for technical advice. Protocol-level surveys to document species presence or absence are not required for the Habitat Plan, with the exception of the least Bell's vireo (Condition 16).

Species surveys are required for all covered activities, including some operations and maintenance activities, subject to the conditions on covered activities except as noted in the following section. Species survey requirements and exemptions are described in greater detail below.

Exemptions from Species Surveys, Preconstruction Surveys, and Construction Monitoring

The following types of covered activities are exempt from species survey and construction monitoring requirements for target covered wildlife species and covered plants. A summary of the types of exemptions available is described in **Table 6-1**. Activities exempt from species surveys must still submit an application package as described above.

- Covered operations or maintenance activities, including those on the Reserve System, that do not result in any ground disturbance or removal of natural land cover types not identified in the following exemptions.
- Covered operations or maintenance activities that occur more than once annually within the same location, as long as applicable surveys are conducted once before initiating the activity in the appropriate season (i.e., wildlife and plant surveys must be conducted during the appropriate time of year) and there are negative survey results. Such activities are likely to result in repeated disturbance that will preclude establishment or persistence of the covered species targeted by these surveys. If species surveys identify wildlife covered species, preconstruction surveys and construction monitoring must be conducted according to the conditions in this chapter. Unavoidable impacts to covered plant species will be tracked toward the Plan's impact limits (**Table 5-16**). All applicable wildlife and plant surveys must be conducted prior to implementation of the covered operations or maintenance activity until the covered species has not been detected at the site for three consecutive years. Applicable surveys will once again be

[29] If new information is found through surveys or other data that greatly changes the understanding of covered species distribution or habitat requirements from that described in this Plan, the Plan would need to be re-evaluated and an amendment may be necessary (see Chapter 10 for the amendment process).

required if operations and maintenance activities cease for three or more consecutive years.

- Covered activities that occur entirely on one or more of the following land cover types[30].
  - Coyote brush scrub.
  - Reservoir.
  - Stream (i.e., riverine) where no riparian or wetland vegetation occurs.
  - Agricultural developed[31].
  - Urban-suburban.
  - Rural-residential.
  - Ornamental woodland.

In addition to the exemptions listed above, covered activities occurring on the land cover types listed below, while subject to the wildlife species surveys, preconstruction surveys, and construction monitoring requirements, will not trigger any covered plant surveys[32].

- Willow riparian forest and scrub.
- Redwood forest.
- Coastal and valley freshwater marsh.
- Pond.
- Orchard.
- Vineyard.
- Grain, row crop, hay and pasture, disked/short-term fallowed.
- Golf courses/urban parks.
- Barren.

Qualified Biologists

Several types of monitoring will be conducted for this Plan including species surveys, preconstruction surveys, construction monitoring, and effectiveness monitoring conducted on the Reserve System. This requirement applies to all monitoring described in this Plan including conditions on covered activities described in this chapter and effectiveness monitoring described in Chapter 7.

[30] These land cover types do not support any of the covered species for which surveys are required.
[31] The land cover type "agriculture developed" (also known as agriculture developed/covered ag) is defined in Chapter 3 as intensive agricultural operations such as nurseries and greenhouses.
[32] Focused surveys for selected covered wildlife may still be required; consult **Table 6-8** and Conditions 13 and 15–18.

Qualified biologists are those biologists who have the experience, education, and training necessary to perform the tasks described in this Plan accurately and in an unbiased fashion. The term “qualified biologist” is used generically to mean a biologist who is trained to perform the given task; such a person is, more specifically, a fisheries biologist, wildlife biologist, or botanist. Training must be in the field to which the task is related. For example, a wildlife biologist may not perform a covered plant survey or delineate land covers for a project application unless the individual is also competent in those fields.

If the task does not have the potential to result in take of covered species (e.g., land cover mapping, establishing perimeters around an active nest or burrows, or monitoring the compliance of construction crews), applicants (or Permittees) may choose their own biologists to conduct these specialized tasks. Applicants will provide the local jurisdiction with a brief resume of the biologist so that the local jurisdiction (or in the case of a Permittee project, the Implementing Entity) can verify the qualifications of the biologist. The local jurisdictions will review these qualifications with the application package. If the local jurisdiction finds the qualifications lacking, they may ask the applicant for additional information or for another survey by a more qualified biologist.

If the task has the potential to result in take of covered species (e.g., discouraging use of a den by a San Joaquin kit fox, handling a California tiger salamander, or conducting effectiveness monitoring described in Chapter 7), the biologist must be approved by the Implementing Entity and Wildlife Agencies prior to conducting such tasks. Biologists conducting this work may be Implementing Entity staff or consultants hired by the Implementing Entity.

To be approved, these biologists must provide the Implementing Entity with credentials demonstrating that he or she has an understanding of the monitoring protocols, data collection techniques, and handling procedures for the covered species. If the Implementing Entity deems the biologist qualified, then the Implementing Entity will forward the recommendation to the Wildlife Agencies for approval. The names, contact information, and written certification of training and qualifications for these biologists will be provided to the appropriate Wildlife Agencies for approval. This documentation will also be on file with the Implementing Entity.

Upon Implementing Entity and Wildlife Agency approval, the Implementing Entity will maintain a list of *pre-approved* qualified biologists who may conduct monitoring work for a 5-year period. This approval process will reduce the need for 2081(a) and/or 10(a)(1)(b) permits as well as the need for the Wildlife Agencies to review qualifications on a case-by-case basis during implementation.

Individuals who are not pre-approved by the Implementing Entity and Wildlife Agencies to conduct monitoring with the potential for take may conduct monitoring if they have a valid recovery permit for the species that they are monitoring. In either case, the biologist will possess all of the qualifications that would otherwise be required under a recovery permit.

Surveys for Breeding Habitat of Select Covered Wildlife Species

While take of covered species and impacts to their known and suitable habitat is assumed and mitigated under the regional approach to mitigation and conservation described above, avoidance of breeding habitat for selected covered wildlife species is required. The selected species have the greatest potential to benefit from avoidance measures and are generally species with lower reproductive rates, such as birds and mammals, which suffer greater consequences from take of individuals, particularly when breeding. Survey requirements for these species are triggered by the presence of specific land cover types and habitat features as described in **Table 6-8**. These species and their habitat features are listed below.

- Western burrowing owl (occupied and nesting habitat, see **Figure 5-11**).
- Least Bell's vireo (breeding habitat in South County[33], see species habitat distribution model in **Appendix D**).
- Tricolored blackbird (breeding habitat, see species habitat distribution model in **Appendix D**).
- San Joaquin kit fox in the Pacheco corridor (denning habitat; see species habitat distribution model in **Appendix D**).
- Bay checkerspot butterfly in serpentine bunchgrass grassland inBay checkerspot butterfly habitat units (see **Appendix D**).

If suitable breeding habitat[34] for these species as defined in **Table 6-8** and in Conditions 13 and 15–18 is identified on site, and if the proposed project could affect this habitat, additional preconstruction surveys are required for the San Joaquin kit fox, western burrowing owl, tricolored blackbird, and least Bell's vireo. Specific survey requirements for these species are detailed in Conditions 13 and 15–18. Surveys for these species will occur on all areas on which the land cover fee will be levied and within any areas that may be encroaching within a required species buffer.

If applicable land cover types or habitat features are present on site, the application package must describe the methods used for the required surveys and the results of these surveys. As indicated in **Table 6-8**, a map of habitat features (e.g., suitable kit fox dens, suitable burrowing owl burrows) is required. If a covered species is observed on site, details of this observation will also be included in the application. CNDDB California Native Species Field Survey Forms will be included for all covered species encountered on the site. Copies of these forms will also be submitted to the CNDDB.

[33] The least Bell's vireo range may expand to the northern portion of the study area during the permit term. The Implementing Entity will periodically monitor outside of the vireo's modeled habitat in the study area to determine if the species' range is expanding (see Section 7.3.3 of Chapter 7, *Species-Level Actions*).
[34] Suitable breeding habitat is defined as habitat identified in the field as suitable for breeding by the target species. Suitable breeding habitat may be different from modeled habitat.

Preconstruction Surveys for Select Covered Wildlife

If the appropriate land cover type and habitat feature listed in **Table 6-8** are present on site, then a preconstruction survey is required for one or more of the five covered wildlife species listed above (**Figures 6-5 and 6-6**). Preconstruction surveys will be required to establish presence or absence of occupied breeding habitat for the applicable species. For example, if a freshwater wetland that could provide suitable breeding habitat for tricolored blackbird is present on site, a preconstruction survey on the site would need to be conducted prior to construction to determine if the site is occupied. If results indicate that breeding tricolored blackbirds are present, then avoidance and minimization measures and construction monitoring must occur, as described in **Table 6-8** and Condition 17.

The Habitat Plan application package will be prepared before project construction in order to receive project approvals from the local agency (or if by a Permittee, to ensure compliance with the Habitat Plan). To ensure compliance with preconstruction survey requirements, project proponents must describe in the application package which surveys are required, when they will be performed, and how they will be applied to the project. This description will follow the requirements in **Table 6-8** and Conditions 15–18 and will be incorporated into the conditions of project approval.

Construction Monitoring for Certain Covered Wildlife

Identification of occupied breeding habitat as defined above will trigger the specified avoidance and minimization requirements described in **Table 6-8** and Conditions 15–18. Construction monitoring will be carried out by a qualified biologist to ensure that these avoidance and minimization requirements are being implemented properly and that they are adequately protecting the target species (**Figures 6-4, 6-5, and 6-6**). Because the selected wildlife species are rare in the study area, it is expected that few projects will require construction monitoring. If required, the construction monitoring frequency and protocols are described for the appropriate species in Conditions 15–18.

Like preconstruction surveys, construction monitoring will occur well after the Habitat Plan application package is prepared. To ensure compliance with the Plan, the application package must describe which construction monitoring and avoidance and minimization requirements may be required and how they will be applied to the project if preconstruction surveys identify occupied breeding habitat. This description will follow the requirements in **Table 6-8** and Conditions 15–18 and will be incorporated into the conditions of project approval. The application will include a description of monitoring frequency and duration (including the time when monitoring will be initiated relative to impacts) and specific construction activities to be monitored. The application will also include a description of the authority of the onsite construction monitor to modify or temporarily stop implementation of the activity if necessary to ensure compliance with the Plan.

Construction monitoring is necessary to ensure that avoidance and minimization measures are implemented in accordance with permit requirements and is the responsibility of the project proponent.

Covered Plant Surveys

Project proponents wishing to affect occurrences of covered plants must notify the Implementing Entity of their construction schedule to allow the Implementing Entity the opportunity to salvage the occurrence (see Condition 19).

The application package must describe the methods used for the required plant surveys and the results of these surveys. If a covered plant occurrence is observed on site, the condition of this occurrence must be described in the application package according to the guidelines in Chapter 5, Section 5.3.1 *Land Acquisition and Restoration Activities* subheading *Incorporating Covered Plant Species*. The condition of each covered plant occurrence must be documented to ensure that occurrences are protected within the Reserve System that are in as good or better condition than those lost to covered activities. CNDDB California Native Species Field Survey Forms will be included in the application package for all covered plants encountered on the site. Copies of these forms will be submitted to the CNDDB.

6.8.6 Item 6: Compliance Documentation

The final component of the Habitat Plan application package is documentation of how any remaining applicable conditions (Conditions 1–14) have been incorporated into the proposed project. If appropriate, a map will be provided to document this compliance.

Verification that conditions have been implemented is primarily the responsibility of the local jurisdiction conducting or approving the covered activity. Participating local jurisdictions will be responsible for reporting the relevant details of approved projects to the Implementing Entity (for entry into the Habitat Plan database and for required reporting to the Wildlife Agencies). The Implementing Entity may contact the local jurisdiction to verify and ensure that the conditions are appropriately implemented.

If the project includes activities for which temporary fees are paid, the project applicant is required to file compliance information at the conclusion of the project. The compliance information will include documentation that the area for which temporary fees were paid was disturbed by covered activities for less than one year. The project proponent must also provide photographs that document the condition of the site before project initiation and (or less) after completion of the covered activity. Based on this information, the local jurisdiction or Implementing Entity will make a determination that the site was recovered to pre-project or ecologically improved conditions within one year of completing construction, that the impacts were actually temporary, and that the fees paid were adequate.

6.9 Confirming Exemption from the Plan

Project proponents seeking permits from a local jurisdiction for activities that would otherwise be covered will need to demonstrate that the project is not a covered activity per the criteria in Chapter 2. Project proponents will need to:

1. demonstrate the size of the project;
2. show that the project is located in an area in **Figure 6-8** where private development is not subject to the Plan;
3. provide a map consistent with the requirements in Section 6.8.3 *Item 3: Land Cover Types on Site* showing that no serpentine, wetland, stream, riparian, or pond land cover types are present on the site;
4. demonstrate that no adverse indirect impacts to wetlands were identified through the applicable environmental review process; and
5. demonstrate that the project is not located in occupied nesting habitat for western burrowing owl based on the most recent western burrowing owl occupied nesting habitat map provided by the Implementing Entity.

Table 6-1. Covered Activities Exempt from Plan Conditions and/or Plan Fees

Covered Activity	Exemptions from Conditions (✓ = exempt)					
	All Chapter 6 Conditions	Wildlife Species Surveys (Conditions 15–18)	Preconstruction Surveys (Conditions 15–18)	Construction Monitoring (Conditions 15–18)	Covered Plant Surveys (Condition 20)	Development Fees[1]
Public Activities						
Routine infrastructure maintenance by public agencies within the planning limit of urban growth that do not affect stream, riparian, serpentine, ponds, or wetland land cover types.	✓	✓	✓	✓	✓	
Routine infrastructure maintenance by public agencies that occurs in urban-suburban, landfill, reservoir, or agriculture developed land cover types that do not affect stream, riparian, serpentine, pond, or wetland cover types. Examples of such activities include filling pot-holes and resurfacing existing roads without expansion of the paved area.	✓	✓	✓	✓	✓	
Private Activities						
Projects that do not result in ground disturbance, do not result in release of potential water quality contaminants, or do not create new wildlife barriers.	✓	✓	✓	✓	✓	
Private-sector, routine-maintenance activities that require a development, grading, or building permit, and that occur inside the Urban Service Area[2].	✓	✓	✓	✓	✓	
Private-sector, routine-maintenance activities that require a development, grading, or building permit; that occur outside of the Urban Service Area; and that occur within 50 feet of all existing structures at the time of Plan commencement or within 50 feet of structures that are permitted for incidental take under the Habitat Plan.	✓	✓	✓	✓	✓	
Additions to existing structures, or new structures that are within 50 feet of an existing structure (e.g., a new garage) that result in less than 5,000 square feet of impervious surface as long as no stream, riparian woodland, wetlands, ponds, or serpentine land cover type are affected[3].	✓	✓	✓	✓	✓	✓

Covered Activity	Exemptions from Conditions (✓ = exempt): All Chapter 6 Conditions	Wildlife Species Surveys (Conditions 15–18)	Preconstruction Surveys (Conditions 15–18)	Construction Monitoring (Conditions 15–18)	Covered Plant Surveys (Condition 20)	Development Fees[1]
Any covered activity described in Chapter 2 that occurs in urban-suburban, landfill, reservoir, or agriculture developed land cover types as verified in the field, unless the activity may affect a mapped or unmapped stream, riparian, serpentine, ponds, or wetland land cover types, or the activity is located in a stream setback.	✓	✓	✓	✓	✓	
A covered activity on a parcel of less than 0.5 acre or less as long as no serpentine, stream, riparian woodland, pond, or wetland land cover type is within the parcel.	✓	✓	✓	✓	✓	
Covered operations or maintenance activities, including those on the Reserve System, that do not result in any ground disturbance or removal of natural land cover types.		✓	✓	✓		
Covered operations or maintenance activities that occur more than once annually within the same location, as long as applicable surveys are conducted once before initiating the activity and there are negative survey results[4, 5].		✓	✓	✓		
Covered activities that occur entirely on one or more of the following land cover types: coyote brush scrub, reservoir, stream (i.e., riverine) where no riparian or wetland vegetation occurs, agricultural developed[6], urban-suburban, rural-residential, or ornamental woodland.		✓	✓	✓		
Covered activities that occur entirely on one or more of the following land cover types: willow riparian forest and scrub, redwood forest, coastal and valley freshwater marsh, pond, orchard, vineyard, grain, row crop, hay and pasture, disked/short-term fallowed, golf courses/urban parks or barren.					✓	
Urban development covered activities (see Section 2.3.2 *Urban Development* in Chapter 2) in Zones A, B, or C on parcels less than 0.5 acre as long as the parcel does not contain or is not adjacent to a stream, riparian woodland or forest, wetland, pond, or serpentine land cover type[8].						✓

Covered Activity	All Chapter 6 Conditions	Wildlife Species Surveys (Conditions 15–18)	Preconstruction Surveys (Conditions 15–18)	Construction Monitoring (Conditions 15–18)	Covered Plant Surveys (Condition 20)	Development Fees[1]
	Exemptions from Conditions (✓ = exempt)					
All development that occurs on land mapped by the Habitat Plan as "urban-suburban", "landfill", "reservoir", or "agriculture developed" land cover types if it is not located in or adjacent to a parcel that contains a stream, riparian woodland or forest, wetland, or serpentine land cover type[9, 10].						✓
Construction of recreational facilities within the Reserve System[11].						✓

Notes:

[1] Does not include the Nitrogen Fee. See Chapter 9 for a complete discussion of all Development Fees.

[2] Private-sector activities that do not require a development, grading, or building permit are not subject to the Plan or its conditions or fees.

[3] Additions are cumulative and must be calculated based on the footprint of the structure at time of Plan implementation to determine whether this threshold has been crossed.

[4] Such activities are likely to result in repeated disturbance that will preclude establishment or persistence of the covered wildlife species targeted by these surveys.

[5] If surveys identify covered species, subsequent surveys must be conducted.

[6] The land cover type "agriculture developed" (also known as agriculture developed/covered ag) is defined in Chapter 3 as intensive agricultural operations such as nurseries and greenhouses.

[7] These land cover types do not support any of the covered species for which surveys are required.

[8] If new vehicle trips are generated, the nitrogen deposition fee may be assessed.

[9] The category "reservoir" excludes dams, which are subject to Habitat Plan fees.

[10] Barns, corrals, ranch homes, and other small patches of existing development were not mapped as these four exempt land cover types because they fell below the 10-acre minimum mapping unit. These sites would also be exempt from the same development fees as long as project proponents demonstrate that they were existing at the time of Plan adoption through air photos or other documentation.

[11] Instead of paying a fee for construction of infrastructure within the Reserve System, new disturbance for infrastructure does not count toward land cover type land acquisition requirements in Chapter 5, but it does count toward the total Reserve System size requirements.

Table 6-2. Aquatic Avoidance and Minimization Measures

ID	Avoidance and Minimization Measure
	General
1	Minimize the potential impacts on covered species most likely to be affected by changes in hydrology and water quality.
2	Reduce stream pollution by removing pollutants from surface runoff before the polluted surface runoff reaches local streams.
3	Maintain the current hydrograph and, to the extent possible, restore the hydrograph to more closely resemble predevelopment conditions.
4	Reduce the potential for scour at stormwater outlets to streams by controlling the rate of flow into the streams.
5	Invasive plant species removed during maintenance will be handled and disposed of in such a manner as to prevent further spread of the invasive species.
6	Activities in the active (i.e., flowing) channel will be avoided. If activities must be conducted in the active channel, avoidance and minimization measures identified in this table will be applied.
7	Personnel shall prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water into channels.
8	Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations).
9	Personnel shall implement measures to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means when removing sediments from the streams.
10	If ground disturbing activities are planned for a stream channel that is known or suspected to contain elevated levels of mercury, the following steps should be taken. 1. Avoid disturbing soils in streams known or suspected to contain high levels of mercury. 2. Soils that are likely to be disturbed or excavated shall be tested for mercury. Soils shall be remediated if: a. disturbed or excavated soils exposed to flood flows below the 2.33-year channel flow level exceed 1 ppm Hg, or b. disturbed or excavated soils above the 2.33-year flow level exceed 20 ppm Hg.
11	Vehicles shall be washed only at approved areas. No washing of vehicles shall occur at job sites.
12	No equipment servicing shall be done in the stream channel or immediate flood plain, unless equipment stationed in these locations cannot be readily relocated (i.e., pumps, generators).
13	Personnel shall use the appropriate equipment for the job that minimizes disturbance to the stream bottom. Appropriately-tired vehicles, either tracked or wheeled, shall be used depending on the situation
14	If high levels of groundwater in a work area are encountered, the water is pumped out of the work site. If necessary to protect water quality, the water shall be directed into specifically constructed infiltration basins, into holding ponds, or onto areas with vegetation to remove sediment prior to the water re-entering a creek.

ID	Avoidance and Minimization Measure
15	If native fish or non-covered, native aquatic vertebrates are present when cofferdams, water bypass structures, and silt barriers are to be installed, a native fish and aquatic vertebrate relocation plan shall be implemented when ecologically appropriate as determined by a qualified biologist to ensure that significant numbers of native fish and aquatic vertebrates are not stranded. Prior to the start of work or during the installation of water diversion structures, native aquatic vertebrates shall be captured in the work area and transferred to another reach as determined by a qualified biologist. Timing of work in streams that supports a significant number of amphibians will be delayed until metamorphosis occurs to minimize impacts to the resource. Capture and relocation of aquatic native vertebrates is not required at individual project sites when site conditions preclude reasonably effective operation of capture gear and equipment, or when the safety of biologist conducting the capture may be compromised. Relocation of native fish or aquatic vertebrates may not always be ecologically appropriate. Prior to capturing native fish and/or vertebrates, the qualified biologist will use a number of factors, including site conditions, system carrying capacity for potential relocated fish, and flow regimes (e.g., if flows are managed) to determine whether a relocation effort is ecologically appropriate. If so, the following factors will be considered when selecting release site(s): 1. similar water temperature as capture location; 2. ample habitat availability prior to release of captured individuals; 3. presence of other same species so that relocation of new individuals will not upset the existing prey/predation function; 4. carrying capacity of the relocation location; 5. potential for relocated individual to transport disease; and 6. low likelihood of fish reentering work site or becoming impinged on exclusion net or screen. Proposals to translocate any covered species will be reviewed and approved by the Wildlife Agencies.
16	When work in a flowing stream is unavoidable, the entire streamflow shall be diverted around the work area by a barrier, except where it has been determined by a qualified biologist that the least environmentally disruptive approach is to work in a flowing stream. Where feasible, water diversion techniques shall allow stream flows to gravity flow around or through the work site.
17	Coffer dams shall be installed both upstream and downstream not more than 100 feet from the extent of the work areas. Coffer dam construction shall be adequate to prevent seepage into or from the work area. Stream flow will be pumped around the work site using pumps and screened intake hoses. All water shall be discharged in a non-erosive manner (e.g., gravel or vegetated bars, on hay bales, on plastic, on concrete, or in storm drains when equipped with filtering devices, etc.).
18	Small in-channel berms that deflect water to one side of the channel during project implementation may be constructed of channel material in channels with low flows.
19	Sumps or basins may also be used to collect water, where appropriate (e.g., in channels with low flows).
20	Diversions shall maintain ambient stream flows below the diversion, and waters discharged below the project site shall not be diminished or degraded by the diversion. All materials placed in the channel to dewater the channel shall be removed when the work is completed. Normal flows shall be restored to the affected stream as soon as is feasible and safe after completion of work at that location.
21	To the extent that stream bed design changes are not part of the project, the stream bed will be returned to as close to pre-project condition as appropriate.
22	To the extent feasible, all temporary diversion structures and the supportive material shall be removed no more than 48 hours after work is completed.
23	Temporary fills, such as for access ramps, diversion structures, or cofferdams, shall be completely removed upon finishing the work.
24	To prevent increases in temperature and decreases in dissolved oxygen (DO), if bypass pipes are used, they shall be properly sized (i.e., larger diameter pipes to better pass the flows). Use of bypass pipes may be avoided by creating a low-flow channel or using other methods to isolate the work area.

ID	Avoidance and Minimization Measure
25	Diversions shall maintain fish passage when the project meets the following conditions: 1) the length of the area dewatered exceeds 500 feet, and/or 2) the length of time the stream is dewatered exceeds two weeks in length. Conditions for fish passage shall be met as long as the diversion 1) maintains contiguous flows through a low flow channel in the channel bed or an artificial open channel, 2) presents no vertical drops exceeding six (6) inches and follows the natural grade of the site, 3) maintains water velocities that shall not exceed eight feet per second (8 ft/sec), and 4) maintains adequate water depths consistent with normal conditions in the project reach. An artificial channel used for fish passage shall be lined with cobble/gravel. A closed conduit pipe shall not be used for fish passage. The inlets of diversions shall be checked daily to prevent accumulation of debris.
26	Any sediment removed from a project site shall be stored and transported in a manner that minimizes water quality impacts.
27	Sediment from the San Francisco Bay Watershed, including that for reuse, will not be removed to areas any farther south than Metcalf Road in south San Jose.
28	Where practical, the removed sediments and gravels will be re-used.
29	Existing native vegetation shall be retained by removing only as much vegetation as necessary to accommodate the trail clearing width. Maintenance roads should be used to avoid effects on riparian corridors.
30	Vegetation control and removal in channels, on stream banks, and along levees and maintenance roads shall be limited to removal necessary for facility inspection purposes, or to meet regulatory requirements or guidelines.
31	When conducting vegetation management, retain as much understory brush and as many trees as feasible, emphasizing shade producing and bank stabilizing vegetation. If riparian vegetation is to be removed with chainsaws, consider using saws currently available that operate with vegetable-based bar oil.
32	In-channel vegetation removal may result in increased local erosion due to increased flow velocity. To minimize the effect, the top of the bank shall be protected by leaving vegetation in place to the maximum extent possible.
33	Regional Board objectives for temperature change in receiving waters (measured 100 feet downstream of discharge point) shall not be exceeded. Receiving water and discharge water may be monitored for temperature changes after a comparison of ambient temperature to pipeline water temperature suggests the potential for change.
	Project Design
34	Use the minimum amount of impermeable surface (building footprint, paved driveway, etc.) as practicable.
35	Use pervious materials, such as gravel or turf pavers, in place of asphalt or concrete to the extent practicable.
36	Use flow control structures such as swales, retention/detention areas, and/or cisterns to maintain the existing (pre-project) peak runoff.
37	Direct downspouts to swales or gardens instead of storm drain inlets.
38	Use flow dissipaters at runoff inlets (e.g., culvert drop-inlets) to reduce the possibility of channel scour at the point of flow entry.
39	Minimize alterations to existing contours and slopes, including grading the minimum area necessary.
40	Maintain native shrubs, trees and groundcover whenever possible and revegetate disturbed areas with local native or non-invasive plants.
41	Combine flow-control with flood control and/or treatment facilities in the form of detention/retention basins, ponds, and/or constructed wetlands.
42	Use flow control structures, permeable pavement, cisterns, and other runoff management methods to ensure no change in post-construction peak runoff volume from pre-project conditions for all covered activities with more than 5,000 square feet of impervious surface.
43	Site characteristics will be evaluated in advance of project design to determine if non-traditional designs, such as bioengineered bank treatments that incorporate live vegetation, can be successfully utilized while meeting the requirements of the project.
44	Maintenance of natural stream characteristics, such as riffle-pool sequences, riparian canopy, sinuosity, floodplain, and a natural channel bed, will be incorporated into the project design.

ID	Avoidance and Minimization Measure
45	Stream crossings shall incorporate a free-span bridge unless infeasible due to engineering or cost constraints or unsuitable based on minimal size of stream (swale without bed and banks or a very small channel). If a bridge design cannot free-span a stream, bridge piers and footings will be designed to have minimum impact on the stream. A hydraulics analysis must be prepared and reviewed by the jurisdictional partner, including SCVWD as appropriate, demonstrating that piers or footings will not cause significant scour or channel erosion. Whenever possible, the span of bridges will also allow for upland habitat beneath the bridge to provide undercrossing areas for wildlife species that will not enter the creek. Native plantings, natural debris, or scattered rocks will be installed under bridges to provide wildlife cover and encourage the use of crossings.
46	Whenever possible, the span of bridges will also allow for upland habitat beneath the bridge to provide undercrossing areas for wildlife species that will not enter the creek.
47	If a culvert is used, up- and downstream ends of the culvert must be appropriately designed so that the stream cannot flow beneath the culvert or create a plunge pool at the downstream end. Preference will be given to designs that allow a natural bottom (arch culvert) and/or which do not alter natural grade.
48	Trails will be sited and designed with the smallest footprint necessary to cross through the in-stream area. Trails will be aligned perpendicular to the channel and be designed to avoid any potential for future erosion. New trails that follow stream courses will be sited outside the riparian corridor.
49	The project or activity must be designed to avoid the removal of riparian vegetation, if feasible. If the removal of riparian vegetation is necessary, the amount shall be minimized to the amount necessary to accomplish the required activity and comply with public health and safety directives.
50	If levee reconstruction requires the removal of vegetation that provides habitat value to the adjacent stream (e.g., shading, bank stabilization, food sources, etc.), then the project will include replacement of the vegetation/habitat that was removed during reconstruction unless it is determined to be inappropriate to do so by the relevant resource agencies (e.g., CDFG and USFWS).
51	All projects will be conducted in conformance with applicable County and/or city drainage policies.
52	Adhere to the siting criteria described for the borrow site covered activity (see Chapter 2 for details).
53	When possible, maintain a vegetated buffer strip between staging/excavation areas and receiving waters.
54	When not within the construction footprint, deep pools within stream reaches shall be maintained as refuge for fish and wildlife by constructing temporary fencing and/or barrier so as to avoid pool destruction and prevent access from the project site.
55	For stream maintenance projects that result in alteration of the stream bed during project implementation, its low flow channel shall be returned to its approximate prior location with appropriate depth for fish passage without creating a potential future bank erosion problem.
56	Increased water velocity at bank protection sites may increase erosion downstream. Therefore, bank stabilization site design shall consider hydraulic effects immediately upstream and downstream of the work area. Bank stabilization projects will be designed and implemented to provide similar roughness and characteristics that may affect flows as the surrounding areas just upstream and downstream of the project site.
57	When parallel to a stream or riparian zone and not located on top of a levee, new trails shall be located behind the top of bank or at the outside edge of the riparian zone except where topographic, resource management, or other constraints or management objectives make this not feasible or undesirable.
58	Existing access routes and levee roads shall be used if available to minimize impacts of new construction in special status species habitats and riparian zones.
59	Trails in areas of moderate or difficult terrain and adjacent to a riparian zone shall be composed of natural materials or shall be designed (e.g., a bridge or boardwalk) to minimize disturbance and need for drainage structures, and to protect water quality.
60	Trail crossings of freshwater stream zones and drainages shall be designed to minimize disturbance, through the use of bridges or culverts, whichever is least environmentally damaging. Structures over water courses shall be carefully placed to minimize disturbance. Erosion control measures shall be taken to prevent erosion at the outfalls of drainage structures.

ID	Avoidance and Minimization Measure
	Construction
61	Minimize ground disturbance to the smallest area feasible.
62	Use existing roads for access and disturbed area for staging as site constraints allow. Off-road travel will avoid sensitive communities such as wetlands and known occurrences of covered plants.
63	Prepare and implement sediment erosion control plans.
64	No winter grading unless approved by City Engineer and specific erosion control measures are incorporated.
65	Control exposed soil by stabilizing slopes (e.g., with erosion control blankets) and protecting channels (e.g., using silt fences or straw wattles).
66	Control sediment runoff using sandbag barriers or straw wattles.
67	No stockpiling or placement of erodible materials in waterways or along areas of natural stormwater flow where materials could be washed into waterways.
68	Stabilize stockpiled soil with geotextile or plastic covers.
69	Maintain construction activities within a defined project area to reduce the amount of disturbed area.
70	Only clear/prepare land which will be actively under construction in the near term.
71	Preserve existing vegetation to the extent possible.
72	Equipment storage, fueling and staging areas will be sited on disturbed areas or non-sensitive habitat outside of a stream channel.
73	Avoid wet season construction.
74	Stabilize site ingress/egress locations.
75	Dispose of all construction waste in designated areas and prevent stormwater from flowing onto or off of these areas.
76	Prevent spills and clean up spilled materials.
77	Sweep nearby streets at least once a day.
78	In-stream projects occurring while the stream is flowing must use appropriate measures to protect water quality, native fish and covered wildlife species at the project site and downstream of the project site.
79	If mercury contamination may be present, the channel must be dewatered prior to commencement of the activity.
80	All personnel working within or adjacent to the stream setback (i.e., those people operating ground-disturbing equipment) will be trained by a qualified biologist in these avoidance and minimization measures and the permit obligations of project proponents working under this Plan.
81	Temporary disturbance or removal of aquatic and riparian vegetation will not exceed the minimum necessary to complete the work.
82	Channel bed temporarily disturbed during construction activities will be returned to pre-project or ecologically improved conditions at the end of construction.
83	Sediments will be stored and transported in a manner that minimizes water quality impacts. If soil is stockpiled, no runoff will be allowed to flow back to the channel.
84	Appropriate erosion control measures (e.g., fiber rolls, filter fences, vegetative buffer strips) will be used on site to reduce siltation and runoff of contaminants into wetlands, ponds, streams, or riparian vegetation. Fiber rolls used for erosion control will be certified as free of noxious weed seed. Filter fences and mesh will be of material that will not entrap reptiles and amphibians. Erosion control measures will be placed between the outer edge of the buffer and the project site.
85	Seed mixtures applied for erosion control will not contain invasive nonnative species and will be composed of native species or sterile nonnative species. If sterile nonnative species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive nonnatives.
86	Topsoil removed during soil excavation will be preserved and used as topsoil during revegetation when it is necessary to conserve the natural seed bank and aid in revegetation of the site.
87	Vehicles operated within and adjacent to streams will be checked and maintained daily to prevent leaks of materials that, if introduced to the water, could be deleterious to aquatic life.

ID	Avoidance and Minimization Measure
88	Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas.
89	The potential for traffic impacts on terrestrial animal species will be minimized by adopting traffic speed limits.
90	All trash will be removed from the site daily to avoid attracting potential predators to the site. Personnel will clean the work site before leaving each day by removing all litter and construction-related materials.
91	To prevent the spread of exotic species and reduce the loss of native species, aquatic species will be netted at the drain outlet when draining reservoirs or ponds to surface waters. Captured native fish, native amphibians, and western pond turtles will be relocated if ecologically appropriate. Exotic species will be dispatched.
92	To minimize the spread of pathogens all staff working in aquatic systems (i.e., streams, ponds, and wetlands)—including site monitors, construction crews, and surveyors—will adhere to the most current guidance for equipment decontamination provided by the Wildlife Agencies at the time of activity implementation. Guidance may require that all materials that come in contact with water or potentially contaminated sediments, including boot and tire treads, be cleaned of all organic matter and scrubbed with an appropriate cleansing solution, and that disposable gloves be worn and changed between handling equipment or animals. Care should be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.
93	When accessing upland areas adjacent to riparian areas or streams, access routes on slopes of greater than 20% should generally be avoided. Subsequent to access, any sloped area should be examined for evidence of instability and either revegetated or filled as necessary to prevent future landslide or erosion.
94	Personnel shall use existing access ramps and roads if available. If temporary access points are necessary, they shall be constructed in a manner that minimizes impacts to streams.
95	To prevent inadvertent entrapment of animals during excavation, all excavated, steep-walled holes or trenches more than 2-feet deep will be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks.
96	Isolate the construction area from flowing water until project materials are installed and erosion protection is in place.
97	Erosion control measures shall be in place at all times during construction. Do not start construction until all temporary control devices (straw bales, silt fences, etc.) are in place downstream of project site.
98	When needed, utilize in-stream grade control structures to control channel scour, sediment routing, and headwall cutting.
	Post-Construction
99	Conduct street cleaning on a regular basis
100	Potential contaminating materials must be stored in covered storage areas or secondary containment that is impervious to leaks and spills
101	Runoff pathways shall be free of trash containers or trash storage areas. Trash storage areas shall be screened or walled
102	Immediately after project completion and before close of seasonal work window, stabilize all exposed soil with mulch, seeding, and/or placement of erosion control blankets .
103	All disturbed soils will be revegetated with native plants and/or grasses or sterile nonnative species suitable for the altered soil conditions upon completion of construction. Local watershed native plants will be used if available. If sterile nonnative species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive nonnatives. All disturbed areas that have been compacted shall be de-compacted prior to planting or seeding. Cut-and-fill slopes will be planted with local native or non-invasive plants suitable for the altered soil conditions.
104	Measures will be utilized on site to prevent erosion along streams (e.g., from road cuts or other grading), including in streams that cross or are adjacent to the project proponent's property. Erosion control measures will utilize natural methods such as erosion control mats or fabric, contour wattling, brush mattresses, or brush layers. For more approaches and detail, please see the *Bank Protection/ Erosion Repair Design Guide* in the Santa Clara Valley Water Resources Protection Collaborative's *User Manual: Guidelines & Standards for Land Use Near Streams* (Santa Clara Valley Water Resources Protection Collaborative 2006).

ID	Avoidance and Minimization Measure
105	Vegetation and debris must be managed in and near culverts and under and near bridges to ensure that entryways remain open and visible to wildlife and that passage through the culvert or bridge remains clear.
106	Prior to undertaking stream maintenance activities, reach conditions will be assessed to identify tasks that are necessary to maintain the channel for the purpose for which it was designed and/or intended (e.g., flood control, groundwater recharge). Only in-stream work that is necessary to maintain the channel will be conducted.
107	On streams managed for flood control purposes, when stream reaches require extensive vegetation thinning or removal (e.g., when the channel has been fully occluded by willows or other vegetation), removal will be phased so that some riparian land cover remains and provides some habitat value. In addition, vegetation removal will be targeted and focused on removing the least amount of riparian vegetation as possible while still meeting the desired flood control needs. For example, vegetation removal should be focused on shrubby undergrowth at the toe-of-slope that is most likely to increase roughness and create a flooding hazard. Vegetation on the upper banks, particularly mature tree canopy, should be maintained to the extent possible to provide habitat for birds and small mammals and shading for the active channel.
108	When reaches require sediment removal, approaches will be considered that may reduce the impacts of the activity. Examples of potential approaches include phasing of removal activities or only removing sediment along one half of the channel bed, allowing the other half to remain relatively undisturbed.
109	In streams not managed for flood control purposes, woody material (including live leaning trees, dead trees, tree trunks, large limbs, and stumps) will be retained unless it is threatening a structure, impedes reasonable access, or is causing bank failure and sediment loading to the stream.
110	If debris blockages threaten bank stability and may increase sedimentation of downstream reaches, debris will be removed. When clearing natural debris blockages (e.g., branches, fallen trees, soil from landslides) from the channel, only remove the minimum amount of debris necessary to maintain flow conveyance (i.e., prevent significant backwatering or pooling). Non-natural debris (e.g., trash, shopping carts, etc.) will be fully removed from the channel.
111	If bank failure occurs due to debris blockages, bank repairs will only use compacted soil, and will be re-seeded with native grasses or sterile nonnative hybrids and stabilized with natural erosion control fabric. If sterile nonnative species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive nonnatives. If compacted soil is not sufficient to stabilize the slope, bioengineering techniques must be used. No hardscape (e.g., concrete or any sort of bare riprap) or rock gabions may be utilized in streams not managed for flood control except in cases where infrastructure or human safety is threatened (e.g., undercutting of existing roads). Rock riprap may only be used to stabilize channels experiencing extreme erosion, and boulders must be backfilled with soil and planted with willows or other native riparian species suitable for planning in such a manner. If available, local native species will be utilized as appropriate.
112	Pumps and generators shall be maintained and operated in a manner that minimizes impacts to water quality and aquatic species.
113	The channel bottom shall be re-graded at the end of the work project to as close to original conditions as possible.
114	Erosion control methods shall be used as appropriate during all phases of routine maintenance projects to control sediment and minimize water quality impacts.
115	All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for wildlife by properly trained construction personnel before the pipe is subsequently buried, capped, or otherwise used or moved in anyway.

Table 6-3. Conditions on Covered Transportation Projects

Design Requirements and Construction Practices	Highway Projects	Roadway Projects [1] and Interchange Upgrades	Mass Transit Projects	Road Safety and Operational Improvements	Dirt Road Construction
Transportation Project Design Requirements					
Background data collection by Habitat Plan Implementing Entity	R	R	R	–	–
Design coordination with Wildlife Agencies[2]	R	R	R	–	–
Enhance existing undercrossings	R	R	R	R	–
• Implement minimum sizing of culverts	R	R	R	R	–
• Install grating over tunnels/culverts for light penetration	P	P	P	P	–
• Install fencing around undercrossings to maximize crossing use	R	R	R	R	–
Road or rail barrier and passage designs for wildlife (to direct wildlife to safe crossings)	R	P	R	R	–
Construction Practices					
Avoidance and minimization measures	R	R	R	R	R
Post-Construction Practices					
Control roadside vegetation adjacent to reserves	R	R	R	R	R
Revegetate cut/fill slopes with native vegetation	R	R	R	R	R
Vegetation management around undercrossings	R	R	R	R	R

Notes:

R = Required

P = Possible (required unless data demonstrate action would not benefit wildlife and CDFG and USFWS agree to omit).

1 Major roadway projects are identified in Table 2-6 and include those projects most likely to adversely affect habitat linkages in the study area.

2 The scope of this review will be limited to the design, location, and extent of the median barrier.

Table 6-4. Rural Road Maintenance Avoidance and Minimization Measures

Avoidance and Minimization Measures		Sediment Management and Erosion Control							Road Maintenance										
		General Construction	Hillside Activities	Spoils Handling and Disposal	Mass Wasting Repair	Minor Slide Repair	Storm-Proofing	Culverts	General	Shoulder Maintenance	Dirt Road Maintenance	Ditch Maintenance	Drainage Systems	Sidecasting	Water Drafting	Vegetation Management	Dust Control	Concrete Work
1	Incorporate erosion control into the planning, construction and follow up phases for all road activities.	X	X	X		X	X	X	X	X	X	X	X	X		X		
2	If working during times when rain might be possible, always have erosion control measures onsite in case of a storm event.	X	X	X		X	X	X	X	X	X	X	X	X				
3	Plan for projects involving disturbance of soil (earthwork) within the riparian setback to occur during the salmonid avoidance season (June 15–October 15) with the exception of emergency or public safety related projects (e.g., clearing a landslide across a road). If avoidance is not possible, utilize appropriate avoidance and minimization measures as described in Conditions 4 and 5.	X	X	X		X	X	X	X	X	X	X	X	X		X		X
4	Set up the work and staging area to minimize the area of soil that will be disturbed and the tracking of soil out of the work area by vehicles and equipment.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	When possible, avoid staging projects in areas where runoff will be concentrated.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Do not stage maintenance equipment in riparian areas or adjacent to streams with the exception of emergency or public safety related projects where no other staging options exist. Avoidance and minimization measures described in Conditions 4 and 5 will be applied as appropriate.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	Use appropriate erosion and sediment control avoidance and minimization measures to secure the staging and project area so that sediment runoff is avoided. Avoidance and minimization measures described in Conditions 4 and 5 will be applied as appropriate.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	Protect storm drain inlets and watercourses using appropriate avoidance and minimization measures. Avoidance and minimization measures described in Conditions 4 and 5 will be applied as appropriate.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	Mulch or revegetate bare soil adjacent to stream channels, or other flow transport paths, to the break-in-slope near those areas.	X	X	X	X	X			X	X		X	X			X		

		Sediment Management and Erosion Control							Road Maintenance									
Avoidance and Minimization Measures		General Construction	Hillside Activities	Spoils Handling and Disposal	Mass Wasting Repair	Minor Slide Repair	Storm-Proofing	Culverts	General	Shoulder Maintenance	Dirt Road Maintenance	Ditch Maintenance	Drainage Systems	Sidecasting	Water Drafting	Vegetation Management	Dust Control	Concrete Work
10	Keep runoff from bare soil well dispersed across a vegetated area to prevent sediment delivery to streams.	X	X	X	X	X			X	X	X	X	X					
11	When possible, direct any concentrated runoff from bare soil areas into natural buffers of vegetation or to gentler sloping areas where sediment can settle out.	X							X		X							
12	Dewater active gullies to prevent their enlargement and to reduce their capacity for sediment transport.	X									X							
13	Dewater old gullies, even if they are not actively eroding, so they no longer carry fine sediment to streams.	X									X							
14	Prevent accelerated landsliding by avoiding, minimizing or eliminating future sidecasting on steep or streamside hillslopes.				X	X					X			X				
15	When possible, divert surface runoff and subsurface drainage to stable sites away from steep, unstable or potentially unstable slopes.				X	X					X							
16	Fit shotgun culvert (culverts with outlets above grade) outlets with downspouts or energy dissipation. When reconstructing culverts, also set the slope of the culvert to match the grade of the streambed.	X						X										
17	Maintain culvert inlets, outlet, and bottom in open and sound condition.							X	X									
18	Identify storm drain inlets, manholes, and watercourses before beginning work. If there is any risk of discharge of sediment or road-related material, protect storm drains with appropriate erosion control and sediment management avoidance and minimization measures. Avoidance and minimization measures described in Conditions 4 and 5 will be applied as appropriate.	X							X									
19	Dispose of all excess materials from paved road maintenance activities at designated sites consistent with spoil disposal and stockpile requirements for various materials. Recycle excess materials.								X									

		Sediment Management and Erosion Control							Road Maintenance									
	Avoidance and Minimization Measures	General Construction	Hillside Activities	Spoils Handling and Disposal	Mass Wasting Repair	Minor Slide Repair	Storm-Proofing	Culverts	General	Shoulder Maintenance	Dirt Road Maintenance	Ditch Maintenance	Drainage Systems	Sidecasting	Water Drafting	Vegetation Management	Dust Control	Concrete Work
20	Avoid sidecasting of soil in all cases where it could be delivered into a watercourse, riparian area, roadside ditch or storm drain. Do not sidecast at all if the slope is sparsely vegetated and it appears that sediment will travel with rain runoff into a stream or estuary system.		X		X	X	X							X				
21	Temporary spoils stockpiles should be located in areas that are relatively level; relatively free of vegetation and away from streams and wetlands areas.	X		X		X			X					X				
22	Remove temporary stockpiles to permanent disposal locations before the rainy season.	X		X		X			X					X				
23	Do not leave loose soil piled in berms alongside the road or ditch. Loose or exposed soil berms are erodible and readily flushed into waterways and storm drains.	X		X					X	X	X			X				
24	If any berm is left in place it must be compacted and stabilized with seeding or asphalt. Frequent well placed breaks in the berms are necessary to allow water to drain from road, preserving the natural drainage pattern of the slope.	X		X														
25	Avoid concentrating sidecasting repeatedly in the same place. Never sidecast large amounts of soil from major landslides.										X			X				
26	In general, maintain unpaved roads to obtain a less erosive running surface and to minimize the need for frequent surface grading. Blade and compact a smooth surface and compact loose soils as needed.										X							
27	Do not apply chemical dust palliatives during rain or immediately before anticipated rain. Approved dust control agents are preferred over water drafting and application.																X	
28	Do not apply chemical or petroleum-based palliatives where they may enter a stream or watercourse unless specifically approved for such use.																X	

		Sediment Management and Erosion Control							Road Maintenance									
Avoidance and Minimization Measures		General Construction	Hillside Activities	Spoils Handling and Disposal	Mass Wasting Repair	Minor Slide Repair	Storm-Proofing	Culverts	General	Shoulder Maintenance	Dirt Road Maintenance	Ditch Maintenance	Drainage Systems	Sidecasting	Water Drafting	Vegetation Management	Dust Control	Concrete Work
29	Avoid disturbance of vegetation outside the essential shoulder area, especially near ditches, streams or watercourses. These vegetated areas help filter sediment from water run-off into ditches or streams and helps prevent erosion.	X							X							X		
30	Grade ditches only when necessary to keep the ditchline free flowing and restore capacity. Unnecessary mechanical grading can cause excess erosion, undermine banks, and expose the toe of the cutslope to erosion or slope failure.											X	X					
31	To control vegetation (rather than remove it entirely), use methods like mowing or weed-whacking when feasible. Vegetation prevents scour and filters out sediment.		X						X			X				X		
32	Whenever feasible, maintain a buffer of vegetation between the ditch and the road. This helps filter sediment from runoff and can be accomplished by using a steeper angle on the grader blade.	X	X						X			X				X		
33	Avoid harming existing vegetation on the cutbank above the ditch to reduce erosion and prevent slope failure.	X	X				X		X			X						
34	When “pulling” a ditch (mechanically grading and removing fine sediment), when possible, avoid spreading ditch spoils across or into the surface rock of the road or shoulder. Consider incorporating the removed soil into localized infrastructure (e.g., trails) and compact soil in place.											X						
35	The recommended minimum diameter for all new culverts, including cross drains, but exclusive of driveway culverts, is 18 inches. Often, small diameter culverts (12 inches or less) plug with debris, causing significant road damage. They are also difficult to clean out.	X						X	X				X					

	Avoidance and Minimization Measures	Sediment Management and Erosion Control							Road Maintenance									
		General Construction	Hillside Activities	Spoils Handling and Disposal	Mass Wasting Repair	Minor Slide Repair	Storm-Proofing	Culverts	General	Shoulder Maintenance	Dirt Road Maintenance	Ditch Maintenance	Drainage Systems	Sidecasting	Water Drafting	Vegetation Management	Dust Control	Concrete Work
36	New culverts on anadromous fish bearing streams will be sized for the 100-year storm event. When replacing smaller existing culverts on anadromous fish bearing streams, and space does not allow for a 100-year storm event culvert without creating excessive disturbance (e.g., additional excavation) culverts will be sized as close to 100-year storm event as possible given site constraints.	X						X										
37	Implement energy dissipation avoidance and minimization measures at cross drain outlets to prevent erosion. Discharges from cross drains onto road fill or other erosive areas often cause significant erosion and slope failure. Make sure that newly-installed cross drains are properly designed to minimize erosion problems. Where erosion is already occurring, work to halt and reverse it with appropriate erosion control avoidance and minimization measures. Avoidance and minimization measures described in Conditions 4 and 5 will be applied as appropriate.	X						X	X				X					
38	Clean cross drains as needed; including clearing vegetation and sediment immediately upslope or downslope of the drain if needed.							X	X				X					
39	Inspect equipment for leaks or damage prior to performing concrete work. Perform maintenance at designated repair facilities.																	X
40	Prior to concrete work, identify storm drain inlets, manholes, and watercourses. Protect storm drains with appropriate sediment management avoidance and minimization measures. Avoidance and minimization measures described in Conditions 4 and 5 will be applied as appropriate.																	X

		Sediment Management and Erosion Control							Road Maintenance										
Avoidance and Minimization Measures		General Construction	Hillside Activities	Spoils Handling and Disposal	Mass Wasting Repair	Minor Slide Repair	Storm-Proofing	Culverts	General	Shoulder Maintenance	Dirt Road Maintenance	Ditch Maintenance	Drainage Systems	Sidecasting	Water Drafting	Vegetation Management	Dust Control	Concrete Work
41	Designate areas to be used for concrete washout and perform washout only in properly constructed containments. When washing equipment or vehicles to remove cement or concrete residue, use only as much water as is needed so that rinse water can be properly contained. For example, use a positive shutoff on the washout hose.																	X
42	Follow these procedures for concrete mixing on site. - Ensure that contractors who fuel and operate cement mixing operations on site have an adequate spill plan and materials for spill containment. - Avoid mixing excess amounts of fresh concrete or cement on site. - Establish mixing plants outside of riparian corridors or near watercourses. - Dry and wet materials should be stored away from waterways and storm drains and should be covered and contained to prevent runoff from rainfall.																	X
43	Remove concrete grindings, rubble, and debris from the site for proper disposal and do not discharge into drain inlets, the storm water drainage system or watercourses.																	X
44	Contain coolant water from concrete cutting and do not discharge into drain inlets, the storm water drainage system or watercourses.																	X
45	When fresh concrete may be exposed to water, (e.g. rainy weather work), use concrete sealants that are approved by the California Department of Fish and Game for this purpose.																	X
46	Perform all in-stream work in dry conditions, and do not work in flowing waters. If a stream is flowing, use a cofferdam or other dewatering avoidance and minimization measures as needed. See Condition 4 for dewatering avoidance and minimization measures.	X						X	X				X					

		Sediment Management and Erosion Control							Road Maintenance									
	Avoidance and Minimization Measures	General Construction	Hillside Activities	Spoils Handling and Disposal	Mass Wasting Repair	Minor Slide Repair	Storm-Proofing	Culverts	General	Shoulder Maintenance	Dirt Road Maintenance	Ditch Maintenance	Drainage Systems	Sidecasting	Water Drafting	Vegetation Management	Dust Control	Concrete Work
47	Identify and map existing permanent disposal sites that can be used for long-term disposal of materials from routine and emergency maintenance activities and provide this information to maintenance crews. These sites should be in upland areas, such as rock pits, ridges, and benches. Locations should be above the 100-year floodplain of the closest stream and away from any groundwater seeps or wetlands.			X	X				X									
48	Minimize disturbance of ground cover or grass on the shoulder to the extent possible (the shoulder is part of the road right-of-way and may need to be kept clear for safety purposes), near ditches and outside of the road right-of-way. If the ground is bladed clean during mowing, the exposed soil will be vulnerable to erosion and could run-off into a creek. Vegetation can also act as a pollution filter that traps sediment and other runoff before it gets into ditches or streams.															X		
49	General guidelines for working within the road right-of-way: - Do not mow beyond 8 feet from the edge of the pavement unless that vegetation must be removed to retain existing drainage patterns or for safety reasons. - Do not remove brush more than 20 feet on either side of the road at bridge structures, unless additional removal is required to address safety concerns or to control noxious weeds. - Do not remove brush more than 10 feet on either side of a culvert, or 10 feet up and downstream from culverts that are 6-feet in diameter or larger, unless management is required for safety concerns or to control noxious weeds. NOTE: Fire management requirements must be considered when using this avoidance and minimization measure.							X	X	X						X		

		Sediment Management and Erosion Control							Road Maintenance									
Avoidance and Minimization Measures		General Construction	Hillside Activities	Spoils Handling and Disposal	Mass Wasting Repair	Minor Slide Repair	Storm-Proofing	Culverts	General	Shoulder Maintenance	Dirt Road Maintenance	Ditch Maintenance	Drainage Systems	Sidecasting	Water Drafting	Vegetation Management	Dust Control	Concrete Work
50	Small quantities of cut brush and trees may be left in riparian areas, adjacent to streams, when cut vegetation: - Does not cause a safety concern or fire hazard; - Does not disturb existing drainage patterns. - Does not contain noxious weeds (consult with appropriate staff about types and locations of noxious weeds); - Is not stockpiled in concentrated areas that can release leachate to surface water.															X		
51	When removing invasive plants and noxious weeds, use complete and thorough treatments. (*Arundo donax* is particularly difficult and requires at least two treatments to remove all underground root networks.)															X		
52	Dispose of larger amounts of vegetation and debris in approved upland disposal areas. Do not dispose of vegetation directly into waterbodies such as streams or wetlands. Do not permanently dispose of concentrated amounts of vegetation that can generate leachate that could affect surface or groundwater quality, unless disposal is at a location permitted for this purpose.															X		

Table 6-5. Habitat for Covered Species Avoided due to the Stream and Riparian Setback Condition

Species/Modeled Habitat	Total Modeled Habitat in Study Area[1]	Amount in Open Space Types 1, 2, and 3[2]	Commitment to Acquire Modeled Habitat for Reserve System[1]	Additional Modeled Habitat Avoided due to Setbacks[3]	Percent of Modeled Habitat Avoided due to Setbacks
California red-legged frog					
Primary habitat (acres)	10,101	3,230	1,300	2,855	28%
Foothill yellow-legged frog					
Primary habitat (miles)	244	70	30	119	49%
Secondary habitat (miles)	447	1526	50	229	51%
Western pond turtle					
Primary habitat (acres)	82,895	28,568	7,000	13,480	16%
Least Bell's vireo					
Primary habitat (acres)	3,097	330	460	837	55%

Notes:
[1] Source: **Table 5-17**.
[2] Open space Types 1, 2, and 3 are assumed to provide some conservation value for covered species.
[3] Excludes setbacks that could occur within the Reserve System and existing open space. Represents a reasonable estimate of avoidance during the permit term if all covered activities occurred. Estimate does not include setbacks from rural residential development, which are difficult to predict in locations precise enough to estimate setback distances.

Table 6-6. Recommended Setbacks to Preserve Riparian and Stream Function (from studies throughout the United States since 1990)

	Function	Citation	Recommended Setback
Physical Properties	Sediment and Nutrient Reduction	Corley et al. 1999	>33 feet
		Nichols et al. 1998	>60 feet
		Woodward and Rock 1995	>50 feet
		Desbonnet et al. 1994	80 feet
		Petersen et al. 1992	>33 feet
		Castelle et al. 1992	>50 feet
		Schellinger and Clausen 1992	75 feet
		Welsch 1991	>85 feet
	Removal of Fecal Coliform	Johnson and Ryba 1992*	75–300 feet
	Moderation of Stream Temperature/Microclimate	Lynch and Corbett 1990	100 feet
	Channel Complexity	Brosofske et al. 1997	>145 feet
		Chapel et al. 1991	135–220 feet
Biological Properties	Salmonid Habitat	Ligon et al. 1999	>150 feet
		Welsch 1991	>85 feet
	Reptile/Amphibian Habitat	Burbink et al. 1998	>325 feet
		Semlitsch 1998	540 feet
		Buhlmann 1998	440 feet
		Rudolph and Dickson 1990	98 feet
	Bird Habitat/Diversity	RHJV 2000	250 feet
		Whitaker and Montevechi 1999	>160 feet
		Hagar 1999	>130 feet
		Kilgo et al. 1998	>1,600 feet
		Richardson and Miller 1997	>160 feet
		Mitchell 1996	>325 feet
		Hodges and Krementz 1996	>325 feet
		Spackman and Hughes 1995	450 feet for 90% of species diversity
	Mammal Habitat/Diversity	Hilty et al. 2006	>1,000 feet
	Plant Diversity	Spackman and Hughes 1995	30–100 feet for 90% of species
	General Riparian/Ecosystem Function	NH FSSWT 2000	100 feet, 300 feet, 600 feet by stream order
		Spence et al. 1996	98–145 feet
		Johnson and Ryba 1992*	> 98 feet
		Chapel et al. 1991	160–650 feet
		Welsch 1991	>85 feet

* Article does not present new data, but instead is a review of existing data.

Table 6-7. Required Stream Setback Distances[1]

Stream Category	Category 1 Streams		
Slope Class	Inside Existing Urban Service Area[2]	Outside Existing Urban Service Area[2]	Category 2 Streams
0–30%	100 feet	150 feet	35 feet
> 30%	150 feet	200 feet	

[1] All distances measured from top of bank. For Category 1 streams, if the edge of riparian vegetation extends beyond setback, the riparian edge becomes the setback plus a 35-foot buffer from riparian edge inside or outside the Urban Service Area. For Category 2 streams, if the site supports riparian vegetation, the setback will extend from the riparian edge plus a 35-foot buffer.

[2] Urban service areas existing at the time of permit issuance for the Habitat Plan.

Table 6-8. Summary of Habitat Survey Requirements and Preconstruction Survey and Monitoring for Select Covered Wildlife Species

Land Cover Type	Species	Specific Habitat Elements	Requirements: Species Habitat Survey[1]	Requirements: Preconstruction Survey	Requirements: Avoidance and Minimization Requirements	Requirements: Construction Monitoring
Any Grassland, Oak Woodland, or Agricultural Land Cover Types	San Joaquin kit fox	• Within the modeled habitat in the study area (see species account in Appendix D for model and parameters)	• Identify and map potential den sites	• Determine status and map all dens (>5 in. diameter) within 250 feet of activity footprint	• Monitor dens • Destroy unoccupied dens • Discourage use of occupied (non-natal) dens	• Establish exclusion zones (>50 feet) for potential dens • Establish exclusion zones (>100 feet) for known dens • Notify USFWS and CDFG of any occupied natal dens • Construction or maintenance personnel must participate in training
	Western burrowing owl	• Within all occupied nesting habitat (**Figure 5-11**). Surveys are not required in sites that are mapped as potential nesting/overwintering or only overwintering habitat	• Identify and map burrows and potential burrows within 250 ft of activity footprint • Document evidence of presence/absence (owls, pellets, whitewash, prey remains) • Species survey in occupied habitat are required in both breeding and non-breeding	• Conduct burrowing owl survey within 2 calendar days of ground disturbance (see Condition 15 for details of required survey methods)	• Avoid occupied nests within a 250-foot buffer during breeding season (Feb 1–Aug 31) or develop a monitoring plan that allows activity within 250-foot buffer (see Condition 15 for requirements) • Avoid occupied burrows during non-breeding season (Sept 1–Jan 31) or meet requirements in Condition 15 if allowing activity within a 250-foot buffer	• Establish buffer zones (250 feet) around active nests if applicable • Establish buffer zones (250 feet) around occupied burrows during non-breeding season if applicable • Implement construction monitoring consistent with monitoring plan or requirements if activities occur within the buffer • Construction or maintenance personnel must participate in training

			Requirements			
Land Cover Type	Species	Specific Habitat Elements	Species Habitat Survey[1]	Preconstruction Survey	Avoidance and Minimization Requirements	Construction Monitoring
Pond or Coastal/ Valley Freshwater Marsh	Tricolored blackbird	• Within 250 feet of verified riparian land, coastal and valley freshwater marsh, or pond cover types	• Identify and map nesting substrate, and marsh habitat	• Document presence/absence of breeding colony within 2 calendar days of disturbance • Document use of habitat (e.g., breeding, foraging) • Determine if the site has been used for nesting in the past 5 years	• Avoid occupied nests colonies during breeding season (Mar 15–July 31) • Avoid nest sites that were occupied in the past 5 years	• Establish 250-foot buffer around outer edge of all hydric vegetation associated with breeding habitat • Construction or maintenance personnel must participate in training • Notify CDFG and USFWS of nest locations immediately
Any Riparian Forest and Scrub Land Cover Types	Least Bell's vireo	• Within potential breeding habitat, as mapped by the Implementing Entity • Within 250 feet of verified riparian land cover types	• Identify and map early successional riparian forest or scrub	• Document presence/absence of nesting least Bell's vireo within 2 calendar days of disturbance • Document use of habitat (e.g., breeding, foraging) • Determine if the site has been used for nesting in the past 3 years	• Avoid occupied nests during breeding season (Mar 15–July 31) • Avoid nest sites that were occupied in the past 3 years	• Establish a 250-foot buffer around occupied nest site • Construction or maintenance personnel must participate in training • Notify CDFG and USFWS of nest locations immediately
Serpentine bunchgrass grassland	Bay checkerspot butterfly	• In Bay checkerspot butterfly habitat units identified in Appendix D • In mapped serpentine that cannot be avoided	• Identify and map extent of larval host plants • Report results of reconnaissance level surveys for adult butterflies	• None	• Locate the project footprint as far from field-verified occupied Bay checkerspot habitat or the highest-quality serpentine habitat as feasible	• None

[1] Changes to project design that result from planning survey information will help avoid impacts to covered species. If no project design changes are needed and site is relatively simple, species habitat surveys could be combined with preconstruction surveys.

Table 6-9. Survey Periods for Covered Plant Species

Species		Survey Period											
Common Name	Scientific Name	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Covered Species													
Tiburon Indian paintbrush	*Castilleja affinis* ssp. *neglecta*				√	√	√	√					
Coyote ceanothus	*Ceanothus ferrisiae*	√	√	√	√	√							
Mount Hamilton thistle	*Cirsium fontinale* var. *campylon*		(√)	(√)	√	√	√	√	√	√	(√)		
Santa Clara Valley dudleya	*Dudleya abramsii* ssp. *setchellii*				√	√	√						
Fragrant fritillary	*Fritillaria liliacea*		√	√	√								
Loma Prieta hoita	*Hoita strobilina*					(√)	√	√	(√)	(√)	(√)		
Smooth lessingia	*Lessingia micradenia* var. *glabrata*							√	√	√	(√)	(√)	
Metcalf Canyon jewelflower	*Streptanthus albidus* ssp. *albidus*				√	√	√	√					
Most beautiful jewelflower	*Streptanthus albidus* ssp. *peramoenus*			√	√	√	√						

Note: (√) indicates flowering periods which are possible but uncommon for the species.

GEOTECHNICAL INVESTIGATION REPORT
NEW PG&E SANTA TERESA SUBSTATION
6402 SANTA TERESA BOULEVARD
SAN JOSE, CALIFORNIA

PROJECT NO. 20163632.001A

JANUARY 26, 2016

January 26, 2016
Project No. 20163632.001A

Pacific Gas and Electric Company
6111 Bollinger Canyon Road, Room 2450K
San Ramon, CA 94583

Attention: Alex Chung (A2CN@pge.com)
Joseph Sun, PhD, PE, GE (JIS4@pge.com)

SUBJECT: 2016_0126_Santa Teresa Substation_Geotechnical Investigation_PLE16R33661
Geotechnical Investigation Report
New PG&E Santa Teresa Substation
6402 Santa Teresa Boulevard
San Jose, California

Dear Mr. Chung:

The attached report presents the results of Kleinfelder's geotechnical investigation for the planned new PG&E Santa Teresa Substation in San Jose, California. The attached report describes the study, findings, conclusions, and recommendations for use in project design and construction. Kleinfelder's services are authorized by Contract Work Authorization No. 2501280865 dated October 21, 2015 and were performed in accordance with the terms of our Master Services Agreement No. 4400007810.

Ground shaking due to regional earthquake activity is anticipated during the life of the project and should be considered in project design. Recommendations for design of foundations, site grading, and other geotechnical considerations are presented in this report. The recommendations presented in this report should be incorporated into project design and construction.

Kleinfelder appreciates the opportunity to provide geotechnical engineering services to PG&E during the design phase of this project. If there are any questions concerning the information presented in this report, please contact this office at your convenience.

Respectfully Submitted,
KLEINFELDER, INC.

Bruce Price, EIT
Staff Engineer

Liana Serrano, PE
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
KENNETH G. SORENSEN
GE2520
Exp. 9/30/2016
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CC: Kris Johnson (kjjohnson@kleinfelder.com)

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FIGURES

1 INTRODUCTION

This report presents the results of our geotechnical investigation conducted for the planned new PG&E Santa Teresa Substation to be located at 6402 Santa Teresa Boulevard in San Jose, California. A site vicinity map is shown on Figure 1.

This report includes conclusions and recommendations related to the geotechnical aspects of project design and construction. Conclusions and recommendations presented in this report are based on the subsurface conditions encountered at the locations of our explorations. Recommendations presented herein should not be extrapolated to other areas or used for other projects without our prior review.

1.1 PROPOSED CONSTRUCTION

We understand PG&E plans to build a new substation that will include a control building, circuit breakers, switchgear, and transformers, dead end structures, and other miscellaneous electrical equipment. Additional details provided by PG&E are noted below:

- Control building likely to be founded on a shallow foundation. Weight approximately 100 kips.
- Transformer bank likely to be founded on a shallow mat slab foundation. Weight approximately 150 kips.
- Dead-end structures:
    - The dead-end structures are anticipated be founded on 3.5-foot diameter, 8.5-foot deep drilled piers.
    - Ground-line moment = 53 foot-kips; ground-line shear = 2.5 kips; axial load 1.5 kips.

Onsite grading is anticipated to consist of minor cuts and fills up to 4 feet to remove any stockpiles, existing structures, and for site drainage toward the north. No retaining walls are anticipated.

1.2 PURPOSE AND SCOPE OF SERVICES

The purpose of this investigation was to explore and evaluate subsurface conditions at the site and develop geotechnical recommendations for project design, specification development, and construction. Kleinfelder's understanding of the project is based on the Geotechnical Investigation

Request dated November 24, 2015 provided by Mr. Alex Chung of PG&E. Our scope of work includes the following:

- Review existing publically available geotechnical information in the vicinity of the project site.
- Field exploration including three Cone Penetration Tests (CPTs) to depths of up to 45 feet to explore subsurface conditions.
- Laboratory testing of samples retrieved from the upper 5 feet to evaluate relevant geotechnical engineering parameters of the subsurface soils including corrosion potential.
- Analyses of the field and laboratory data to develop conclusions and recommendations to guide the geotechnical design and construction of the project.
- Preparation of this report.

Environmental evaluations and analyses, including detailed review of possible contaminants in the foundation soils, are outside of our scope of services.

2 FIELD EXPLORATION AND LABORATORY TESTING

2.1 FIELD EXPLORATION

2.1.1 Cone Penetration Tests

Prior to subsurface exploration, site-specific health and safety plan was prepared for the field exploration activities. This plan was discussed with the filed crew prior to the start of field exploration work. The area of explorations was marked and Underground Service Alert (USA) was contacted to provide utility clearance in the public right-of-way. In addition, the upper 5 feet of the exploration locations were cleared using hand auger methods to confirm the absence of buried utilities.

The locations of the explorations are shown on Figure 2, Site Plan. Explorations were located in the field by measuring from existing landmarks. Horizontal coordinates and elevations of the explorations were not surveyed.

On December 28, 2015 three CPT soundings (CPT-01, CPT-02, and CPT-03) were advanced to depths of about 45 feet below the ground surface. The CPT soundings were performed by Middle Earth Geo Testing, Inc. of Hayward, California using a 25-ton, truck-mounted, International Paystar 5000 CPT rig.

The CPT soundings were performed in general accordance with ASTM D5778 using an electronic cone penetrometer. A set of hydraulic rams were used to continuously push the cone and rods into the soil at a rate of approximately 2 centimeters per second while the cone tip resistance (Qt) and sleeve friction resistance (Fs) were recorded in 2-centimeter increments.

The cone penetration assembly used consists of a conical tip and a cylindrical friction sleeve. The conical tip has a 60-degree apex angle and approximately 3.6 centimeter diameter. The cylindrical friction sleeve has a surface area of 10 square centimeters. The CPT data (cone tip resistance, sleeve friction resistance, friction ratio, and equivalent Standard Penetration Test blow counts) versus penetration depth below the existing ground surface are presented on the CPT logs in Appendix A.

The stratigraphic interpretation of the CPT data was performed based on relationships between cone tip resistance and sleeve friction resistance versus penetration depth. The friction ratio, which is sleeve friction resistance divided by cone tip resistance, is a calculated parameter which is used to infer soil behavior type. Cohesive soils (clays) generally have high friction ratios, low cone tip resistance values, and generate large excess pore water pressures. Cohesionless soils (sands) generally have lower friction ratios, high cone tip resistance values, and generate small excess pore water pressures. The interpretation of soil behavior type from the cone data was carried out based on Robertson and Cabal (2012) and Robertson (2009). It should be noted that it is not always possible to clearly identify a soil type based on cone tip resistance and sleeve friction resistance. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type.

After the CPTs were completed they were backfilled with neat cement grout.

2.1.2 Sampling Procedures

Near-surface bulk samples were obtained from hand-auger cuttings in the upper 5 feet of the CPT explorations. Soil samples were packaged and sealed in the field to reduce moisture loss. Following the field exploration, the samples were returned to our laboratory for further examination and testing.

2.2 LABORATORY TESTING

Kleinfelder performed laboratory tests on samples retrieved from the upper five feet to evaluate their physical and engineering characteristics. The following laboratory tests were performed:

- Atterberg Limits (ASTM D4318)
- Corrosion - Soluble Sulfate Content (ASTM D4327)
- Corrosion - Soluble Chloride Content (ASTM D4327)
- Corrosion - pH (ASTM D4972)
- Corrosion - Minimum Resistivity (ASTM G57)
- Corrosion - Redox (ASTM D1498)
- Corrosion - Sulfide (ASTM D4658)

The results of the laboratory tests and the test data are included in Appendix B.

3 GEOLOGIC CONDITIONS

3.1 SITE GEOLOGY

The site is located within Santa Clara Valley, which lies between the Santa Cruz Mountains to the southwest and the Diablo Range to the northeast. The Santa Clara Valley extends about 70 miles to the southeast from San Francisco and is filled with over 1,500 feet of Quaternary and late Tertiary age alluvial sediments deposited by the many creeks that flow from the bordering hills and mountains.

The project site has been mapped by the California Geological Survey as part of their Seismic Hazard Zonation Program in a Seismic Hazard Zonation Report for the Santa Teresa Hills Quadrangle (CGS, 2003). The report includes borehole log information relating to subsurface geology and engineering characteristics compiled from unpublished consultants' geotechnical and environmental reports and filed with the California Department of Transportation and the City of San Jose Department of Public Works. Based geologic mapping within the CGS (2003) report, the planned substation is underlain by Holocene Age Alluvial Fan Levee deposits which are generally comprised of interbedded clay, silt, and silty sand, and are considered to have a low liquefaction potential when groundwater is deeper than 30 feet. In this area, the Alluvial Fan Levee deposits are associated with the Coyote Creek, located about a mile north of the site (see Figure 1).

3.2 LOCAL AND REGIONAL FAULTING

In the City of San Jose, faults are mapped or zoned by three agencies where site-specific studies addressing the potential for surface fault rupture are required; the City of San Jose (City), Santa Clara County (County), and as Alquist-Priolo Fault Zones (AP Zones) by the State of California (State). The substation is not located within a State, County, or City designated fault zone, and no known active faults traverse the alignment. The nearest faults to the project site are the Coyote Creek fault zone (located about 2 miles to the east), the Hayward Fault zone (located about 4 miles to the northeast), and the Calaveras fault zone (located about 8 miles to the east). Other faults that may contribute to ground shaking at the site include the Sargent fault zone (located about 10 miles to the southwest) and the San Andreas fault zone (located about 11 miles to the southwest).

4 SITE CONDITIONS

4.1 SITE DESCRIPTION

The project site is located in a mixed industrial, commercial, and residential area in southern San Jose. The PG&E Santa Teresa Substation is planned to be located behind the existing PG&E Edenvale Service Center (see Figure 1) in a relatively flat lot that is currently used as a PG&E training facility and storage yard. The ground surface includes bare earth, gravel paving, and asphalt-concrete paving. Existing structures within the footprint of the planned substation include wood poles used for training, and a three-sided masonry block storage structure. The site is bordered to the east by the Santa Teresa light rail station, to the north by Highway 85, to the west by Miyuki Drive, and to the south by the PG&E Edenvale Service Center.

4.2 SUBSURFACE CONDITIONS

The following description provides a general summary of the subsurface conditions encountered during this study. Soil descriptions for the upper 5 feet of the subsurface profile are based on observation of the hand auger cuttings. Soil descriptions below 5 feet are based on inferred soil behavior type, as discussed in Section 2, above. For more thorough representations of the actual conditions encountered at specific locations, refer to the hand auger and CPT logs in Appendix A. Note that due to the hand augering process, the upper 5 feet of the CPT log should be disregarded.

Our field exploration generally encountered up to 1 foot of gravel and gravelly lean clay fill, underlain by moist, dark reddish brown to dark brown, hard, lean clay within the hand augered upper 5 feet. The soil behavior types inferred by the CPTs consist of firm to hard lean clay with varying amounts of sand and silt from about 5 feet to the depth explored (45 feet), except for a layer of silty sand and sandy silt encountered between depths of about 22 to 27 feet. The subsurface conditions encountered in our CPTs are in general agreement with the mapped geology and borehole log data available from the CGS (2003).

4.3 GROUNDWATER

Groundwater was not encountered within the CPTs performed for our field exploration, based on pore water dissipation measurements. According to publicly available well data published online by the State Water Resources Control Board (www.water.ca.gov) for two nearby wells, one located 700 feet west and the other 1,200 feet southwest from the site, previous groundwater levels trend from a high of about 30 feet in 2012 to about 70 feet in late 2015. This is in general agreement with groundwater level mapping by the CGS (2003) at the project site at depths greater than 30 feet below the ground surface.

It is possible that groundwater conditions at the site could change due to variations in rainfall, groundwater withdrawal or recharge, construction activities, well pumping and irrigation, or other factors not apparent at the time the study was performed.

4.4 VARIATIONS IN SUBSURFACE CONDITIONS

Our interpretations of soil and groundwater conditions at the site are based on the conditions encountered in the CPTs performed for this project, with confirmation from publically available borehole data from the CGS (2003). The conclusions and recommendations that follow are based on those interpretations. If soil or groundwater conditions exposed during construction vary from those presented in this report, Kleinfelder should be notified to evaluate whether our conclusions or recommendations should be modified.

5 CONCLUSIONS AND RECOMMENDATIONS

From a geotechnical standpoint, the proposed construction is feasible provided the recommendations presented in this report are incorporated into the project design and construction. The following sections discuss conclusions and recommendations with respect to geologic and seismic hazards, California Building Code (CBC) design considerations, site preparation and grading, and foundation design.

5.1 LIQUEFACTION

Earthquake-induced soil liquefaction can be described as a significant loss of soil strength and stiffness caused by an increase in pore water pressure resulting from cyclic loading during shaking. Liquefaction is most prevalent in loose to medium dense, sandy and gravely soils below the groundwater table but can also occur in non-plastic to low-plasticity, finer-grained soils. The potential consequences of liquefaction to engineered structures include loss of bearing capacity, buoyancy forces on underground structures, ground oscillations or “cyclic mobility,” increased lateral earth pressures on retaining walls, liquefaction settlement, and lateral spreading or “flow failures” in slopes.

In the past decade, several concentrated efforts have been undertaken to establish a uniform guideline for field-based simplified liquefaction analyses. Youd et al. (2001) published general guidelines for liquefaction analyses, which presented the consensus of a task committee. However, subsequent earthquakes provided additional data to researchers, especially for low plasticity clays and silts, which resulted in significant modifications to liquefaction evaluation methods, especially for soils with higher fines contents. Liquefaction triggering analyses were performed using the methods proposed by Youd et al. (2001) and Idriss and Boulanger (2008) using the information obtained from CPT-01 advanced as part of this study. In order to perform liquefaction analysis, estimates of earthquake magnitude and peak ground acceleration (PGA_M) are needed. Using the U.S. Geological Survey (USGS) interactive deaggregation website, the modal earthquake magnitude M_W = 6.6 was estimated and used in the analysis. Peak ground acceleration (PGA_M) value for our analyses was calculated based on Equation 11.8-1 in Section 11.8.3 of the American Society of Civil Engineers (ASCE) 7-10 for the Risk-Targeted Maximum Considered Earthquake (MCE_R). The PGA_M value was calculated using the US Seismic Design Maps application assuming a Site Class D. The calculated PGA_M value is 0.584g for the MCE_R.

The evaluation of liquefaction in response to an earthquake is based on a comparison of a soil's resistance to liquefaction and the cyclic load or demand placed on the soil by the earthquake. A safety factor against liquefaction is commonly defined as the ratio of the cyclic shear stress required to cause liquefaction (cyclic resistance ratio, or CRR) to the equivalent cyclic shear stress induced by the earthquake (cyclic stress ratio, or CSR). Per CGS Special Publication 117A (CGS, 2008), if the calculated safety factor against liquefaction (i.e., the ratio CRR/CSR) is less than about 1.3 the soil is considered to be liquefiable for design purposes. Liquefaction-induced settlements were estimated using Youd et al. (2001) method and the Idriss and Boulanger (2008) method.

Based on publically available well data, design groundwater level for liquefaction analysis was selected at 30 feet below existing grade.

Based on the depth to design groundwater and the soil conditions encountered in our field investigation, the potential for liquefaction-related settlement is considered negligible.

5.2 EXPANSIVE SOILS

The surficial soils have a low expansion potential based on the results of an Atterberg limits test (Liquid Limit of 29 and Plasticity Index of 11) performed on a near-surface sample of lean clay taken from the upper 5 feet of CPT-01. Expansive soils are not anticipated to be a concern for the planned foundations.

5.3 2013 CBC SEISMIC DESIGN PARAMETERS

For a 2013 California Building Code (CBC) based design, the estimated Maximum Considered Earthquake (MCE) mapped spectral accelerations for 0.2 second and 1 second periods (S_S and S_1), associated soil amplification factors (F_a and F_v), and mapped peak ground acceleration (PGA) are presented in Table 5-1. Corresponding site modified (S_{MS} and S_{M1}) and design (S_{DS} and S_{D1}) spectral accelerations, PGA modification coefficient (F_{PGA}), PGA_M, risk coefficients (C_{RS} and C_{R1}), and long-period transition period (T_L) are also presented in Table 5-1. Presented values were estimated using Section 1613.3 of the 2013 California Building Code (CBC), chapters 11 and 22 of ASCE 7-10, and the United States Geological Survey (USGS) U.S. seismic design maps.

Table 5-1
Ground Motion Parameters Based on 2013 CBC

Parameter	Value	Reference
S_S	1.536g	2013 CBC Section 1613.3.1
S_1	0.600g	2013 CBC Section 1613.3.1
Site Class	D	2013 CBC Section 1613.3.2
F_a	1.000	2013 CBC Table 1613.3.3(1)
F_v	1.500	2013 CBC Table 1613.3.3(2)
PGA	0.584	ASCE 7-10 Figure 22-7
S_{MS}	1.536g	2013 CBC Section 1613.3.3
S_{M1}	0.900g	2013 CBC Section 1613.3.3
S_{DS}	1.024g	2013 CBC Section 1613.4.4
S_{D1}	0.600g	2013 CBC Section 1613.4.4
F_{PGA}	1.000	ASCE 7-10 Table 11.8-1
PGA_M	0.584g	ASCE 7-10 Section 11.8.3
C_{RS}	1.111	ASCE 7-10 Figure 22-17
C_{R1}	1.065	ASCE 7-10 Figure 22-18
T_L	12 seconds	ASCE 7-10 Figure 22-12

5.4 SITE PREPARATION

5.4.1 General

It is anticipated that site grading can be performed with conventional grading equipment and techniques. Site grading should be performed with drainage toward the north. General recommendations for site preparation and earthwork construction are presented in the following sections of this report. All references to compaction, maximum density and optimum moisture content are based on ASTM D1557, unless otherwise noted.

5.4.2 Stripping and Grubbing

Any miscellaneous surface obstructions, vegetation, debris or other deleterious materials should be removed from the project area prior to any site grading. The stripped materials should not be incorporated into any engineered fill. Existing pavements to be demolished should include removal of the pavement and aggregate base materials. Existing foundations for the wooden power poles and masonry block storage structures should be removed and the subsurface excavated to expose firm soil.

5.4.3 Disturbed Soil, Undocumented Fill and Subsurface Obstructions

Initial site grading should include a reasonable search to locate soil disturbed by previous activity, any undocumented fill soils, and abandoned underground structures or existing utilities that may exist within the areas of construction. Any loose or disturbed soils, void spaces, or undocumented fill that may be encountered should be over-excavated to expose firm soil, as approved by a representative of Kleinfelder.

5.4.4 Scarification and Compaction

In areas requiring placement of fill, it is recommended the fill be placed and compacted as engineered fill. Following site stripping and any required grubbing and/or over-excavation, it is recommended areas to receive engineered fill be scarified to a depth of 8 inches, uniformly moisture conditioned to at least 2 percent above the optimum moisture content and compacted to at least 90 percent relative compaction.

If undocumented fill is encountered, the fill should be over-excavated and replaced as engineered fill compacted as recommended below in the “Engineered Fill- Compaction Criteria” section of this report.

5.5 ENGINEERED FILL

5.5.1 Onsite Materials

The excavated on-site soil is anticipated to consist of lean clay. The on-site soil is suitable for use as engineered fill, provided it is free of debris, significant organics or other deleterious materials, and has a maximum particle size less than 3 inches in maximum dimension. Where imported material is brought in for engineered and “non-expansive” fill, it is recommended that it be granular in nature and conform to the minimum criteria discussed in Section 5.5.2.

5.5.2 Imported and Non-Expansive Fill Requirements

In addition to the above requirements, specific requirements for imported engineered fill and non-expansive engineered fill as well as applicable test procedures to verify material suitability are provided in Table 5-2.

Table 5-2
Imported and Non-Expansive Engineered Fill Requirements

Fill Requirement		**Test Procedures**	
Gradation		**ASTM**[1]	**Caltrans**[2]
Sieve Size	**Percent Passing**		
3 inch	100	D422	202
¾ inch	70-100	D422	202
No. 200	20-50	D422	202
Liquid Limit	Plasticity Index		
<30	<12	D4318	204
Organic Content			
No visible organics		---	---
Expansion Potential			---
20 or less		D4829	---
Soluble Sulfates			
Less than 2,000 ppm		---	417
Soluble Chloride			
Less than 300 ppm		---	422
Resistivity			
Greater than 2,000 ohm-cm		---	643

[1]*American Society for Testing and Materials Standards (latest edition)*
[2]*State of California, Department of Transportation, Standard Test Methods (latest edition)*

Imported materials to be used for engineered fill should be sampled and tested by Kleinfelder prior to being transported to the site. Highly pervious materials such as clean crushed stone or pea gravel are not recommended for use in engineered fill because they can permit transmission of water into the underlying materials. We recommend representative samples of imported materials proposed for use as engineered fill be submitted to Kleinfelder for testing and approval at least one week prior to the start of grading and import of this material.

In addition, we recommend that a laboratory corrosion test series (pH, resistivity, redox, sulfides, chlorides, and sulfates) be performed on all proposed import materials. The corrosivity of proposed import materials should be evaluated and should be no more corrosive than the on-site soils as indicated by the laboratory results presented in this report.

5.5.3 Placement and Compaction Criteria

Imported non-expansive soils that meet the criteria outlined in Table 5-2 that are to be used for engineered fill should be uniformly moisture conditioned to at least the optimum moisture content, placed in horizontal lifts less than about 8 inches in loose thickness, and compacted to at least 90 percent relative compaction. Onsite clayey soils to be used for general fill should be uniformly moisture conditioned to at least 2 percent over the optimum moisture content, placed in horizontal lifts less than about 8 inches in loose thickness, and compacted to between at least 90 percent relative compaction.

5.6 WET WEATHER CONSIDERATIONS

Should construction be performed during or subsequent to wet weather, near-surface site soils may be significantly above the optimum moisture content. These conditions could hamper equipment maneuverability and efforts to compact site soils to the recommended compaction criteria. Disking to aerate, chemical treatment, replacement with drier material, stabilization with a geotextile fabric or geogrid, or other methods may be required to mitigate the effects of excessive soil moisture and facilitate earthwork and construction operations.

5.7 SITE DRAINAGE

Final site grading should provide surface drainage away from all structures and areas to be traversed by vehicles and maintenance equipment. In general, we recommend consideration be given to providing at least 1 to 2 percent slope away from structure foundations or access ways.

5.8 TEMPORARY EXCAVATIONS

5.8.1 General

All excavations should comply with applicable local, state, and federal safety regulations including the current Occupational Safety & Health Administration (OSHA) Excavation and Trench Safety Standards. Construction site safety generally is the responsibility of the Contractor, who is responsible for the means, methods, and sequencing of construction operations. Kleinfelder is providing the information below solely as a service to the client. Under no circumstances should the information provided be interpreted to mean that Kleinfelder is assuming responsibility for construction site safety or the Contractor's activities. Such responsibility is not being implied and should not be inferred.

5.8.2 Excavation and Slopes

Excavated slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, and/or federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations). Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

5.9 TRENCH BACKFILL

All trench backfill should be placed and compacted in accordance with recommendations provided for engineered fill (see Section 5.5). Mechanical compaction is recommended. Ponding or jetting should not be used as a sole means of soil compaction.

5.10 SHALLOW FOUNDATION DESIGN

Foundations should satisfy two independent criteria with respect to foundation soils. First, the foundation should have an adequate safety factor against bearing failure with respect to the shear strength of the foundation soils. Second, the vertical movements of the foundation due to settlement (both immediate elastic settlement and consolidation settlement) and/or heave should be within tolerable limits for the structure.

Lightly-loaded structures may be supported on conventional, shallow, reinforced concrete mat foundations or continuous footings, provided the site structures can tolerate the anticipated settlement. Recommendations for foundation design are presented below.

5.10.1 Spread Footings

5.10.1.1 Allowable Bearing Pressure

Shallow spread footings constructed of reinforced concrete may be founded on approved undisturbed native soil and/or engineered fill. The footings should be founded at least 18 inches below lowest adjacent finished grade on subgrade soils that have been prepared in accordance with the recommendations provided in this report. Continuous footings should have a minimum width of 12 inches, and isolated rectangular footings should have a minimum width of 24 inches.

Depending on the settlement tolerances of the planned structures, spread footings may be designed for a net allowable bearing pressure of up to 2,000 pounds per square foot (psf) due to dead plus live loads.

The allowable bearing pressure provided above is a net value. Therefore, the weight of the foundation that extends below grade may be neglected when computing dead loads. The allowable bearing pressure applies to dead plus live loads and includes a safety factor of at least 3 with respect shear failure of the foundation soils. The net allowable bearing pressure may be increased by one-third for short-term loading due to wind or seismic forces.

To maintain the desired support, foundations adjacent to utility trenches or other existing foundations should be deepened so that their bearing surfaces are below an imaginary plane having an inclination of 2 horizontal to 1 vertical, extending upward from the bottom edge of the adjacent foundations or utility trenches.

5.10.1.2 Lateral Load Resistance

Lateral loads may be resisted by a combination of friction between the foundation bottoms and the supporting subgrade, and by passive resistance acting against the vertical faces of the foundations. An allowable coefficient of sliding friction of 0.30 between the foundation and the supporting subgrade may be used for design. This value includes a safety factor of at least 1.5. For allowable passive resistance, an equivalent fluid weight of 300 pounds per cubic foot (pcf) acting against the side of the foundation may be used. This value is based on a safety factor of at least 1.5 and generally corresponds to a lateral deflection of less than ½ inch. Passive resistance in the upper 12 inches of soil should be neglected unless the area in front of the footing is protected from disturbance by concrete or pavement. The allowable friction coefficient and passive resistance may be used concurrently.

5.10.1.3 Settlement and Heave

Total settlement and/or heave of an individual foundation will vary depending on the plan dimensions of the foundation and the actual load supported. Based on anticipated foundation dimensions and loads, we estimate maximum total settlement of foundations designed and constructed in accordance with the preceding recommendations to be on the order of 1 inch or less. Differential settlement between similarly loaded, adjacent footings is estimated to be about half the total settlement. Ground heave due to expansive soil effects is not anticipated at the project site.

5.10.1.4 Spread Footing Construction Considerations

Prior to placing steel or concrete, foundation excavations should be cleaned of any debris, disturbed soil or water. All foundation excavations should be observed by a representative of Kleinfelder just prior to placing steel or concrete. The purpose of these observations is to check that the bearing soils actually encountered in the foundation excavations are similar to those assumed in analysis and to verify the recommendations contained herein are implemented during construction.

5.10.2 Mat Foundations

5.10.2.1 Subgrade Preparation

We recommend that the bottoms of excavations to receive mat slabs be scarified to a depth of at least 8 inches, uniformly moisture conditioned to at least 2 percent above the optimum moisture content, and compacted to at least 90 percent relative compaction. These excavations should be covered as soon as possible and/or be wetted periodically so the soils are not allowed to dry out prior to concrete placement.

Beneath cast-in-place concrete mat foundations, we recommend the design include a base course of well-graded crushed aggregate (such as Caltrans Class 2 Aggregate Base) at least 4 inches thick. Under slabs that will be subjected to vehicle loading, the aggregate base course thickness should be increased to a minimum of 6 inches. The base course should be compacted to at least 95 percent relative compaction at a moisture content slightly above optimum. Thickened slab edges should engage the building pad soil and should not be underlain by the gravel base course.

5.10.2.2 Allowable Bearing Pressure

For subgrades prepared as recommended in this report, reinforced concrete mat foundations may be designed for a net allowable bearing pressure of up to 1,500 psf. The allowable bearing pressure applies to dead plus live loads, includes a safety factor of at least 3 with respect to shear failure of the foundation soils, and may be increased by one-third for short-term loading due to wind or seismic forces.

5.10.2.3 Lateral Load Resistance

Lateral loads may be resisted by a combination of friction between the foundation bottoms and the supporting subgrade, and by passive resistance acting against the vertical faces of the foundations. An allowable coefficient of sliding friction of 0.30 between the foundation and the supporting subgrade may be used for design. This value includes a safety factor of at least 1.5. For allowable passive resistance, an equivalent fluid weight of 300 pounds per cubic foot (pcf) acting against the side of the foundation may be used. This value is based on a safety factor of at least 1.5 and generally corresponds to a lateral deflection of less than ½ inch. Passive resistance in the upper 12 inches should be neglected unless the area in front of the foundation is protected from disturbance by concrete or pavement. The friction coefficient and passive resistance may be used concurrently.

5.10.2.4 Subgrade Modulus

An allowable modulus of subgrade reaction, K_{v1}, of 75 pounds per square inch per inch of deflection (for a 1 square-foot bearing plate) may be used for design in the on-site lean clay soils. The modulus should be adjusted for the actual slab size using appropriate formulas or software.

5.10.2.5 Settlement

Total settlement of an individual foundation will vary depending on the plan dimensions of the foundation and the actual load supported. For smaller mat slabs supporting electrical equipment (generally about 8 feet wide), total settlement is anticipated to be less than about ½ inch. For the larger transformer mat slabs, we estimate maximum total settlement of the foundations with dimensions up to 15 by 30 feet that are designed and constructed in accordance with the preceding recommendations to be on the order of 1 inch or less. Differential settlement between the center and corners of the mat is estimated to be about ⅔ of the total settlement.

5.10.2.6 Mat Foundation Construction Considerations

Underground utilities that are 4 feet deep or shallower and that run parallel to shallow mat foundations generally should be located no closer than 2 feet horizontally away from the perimeter edges of the slab. Deeper utilities should be located above a 1H:1V (horizontal to vertical) slope projected downward from the bottom edges of the slab. Utility plans should be reviewed by Kleinfelder prior to trenching to evaluate conformance with this requirement. Turned down or thickened edges at least 12 inches deep should be used to provide perimeter confinement and reduce the potential for water infiltration beneath the slabs.

5.11 DRILLED PIER FOUNDATIONS

It is our understanding that the dead end structures and other possible additional structures will be founded on reinforced concrete drilled pier foundations. Recommendations for design and construction of drilled pier foundations are presented in the following sections of this report.

5.11.1 Axial Capacity

Axial loads on drilled piers should be supported by skin friction. End bearing is not considered in the axial capacity due to strain incompatibility issues between skin friction and end bearing, settlement issues, and the potential for loose materials to exist at the bottoms of the pier holes during construction that cannot be effectively cleaned out. The downward vertical movement associated with mobilizing the full end-bearing resistance of drilled piers is frequently beyond structural tolerances and normally well beyond the movement required to engage side friction.

A curve illustrating the ultimate axial compressive capacity of a unit (1-foot) diameter straight-sided drilled pier installed from existing grade is shown on Figures 3a and 3b. Axial capacity was computed using Federal Highway Administration (FHWA) procedures for design of drilled pier foundations (Brown et al., 2010). Skin friction capacity in the upper 2 feet of soil was neglected in our analyses. Ultimate tensile capacity may be obtained by multiplying the compressive capacity by a factor of 0.8 and adding the weight of the foundation. For evaluation of allowable axial capacity under static conditions, we recommend a factor of safety of 3 be applied to the ultimate capacity (per the General Order 95 code). A one-third increase in the allowable capacity may be used for consideration of transient loads such as wind or seismic.

Capacities for drilled piers with diameters other than 1 foot may be obtained by multiplying the capacity for the 1 foot diameter pier by the actual pier diameter (in feet). The weight of the foundation is not included in the ultimate resistance shown on Figures 3a and 3b. The curve is applicable for drilled pier foundations up to 7 feet in diameter that are spaced at least 3 diameters apart. For closer spacings, group effects may govern and the group capacity should be evaluated.

5.11.1.1 Estimated Settlement

Based on the methods outlined by Brown et al. (2010), total static settlement of each drilled pier should be on the order of 0.1 percent of the pier diameter for a drilled pier designed and constructed in accordance with the recommendations presented in this report. This value includes elastic compression of the pile under design loads. The majority of the settlement should occur during and shortly after application of the structure loads.

5.11.2 Lateral Response

5.11.2.1 LPILE Analysis Soil Parameters

Lateral capacity of deep foundations may be developed through analysis of pier or pile response due to a range of design loads. Table 5-3 contains recommended input soil parameters for lateral response analysis of deep foundations using the LPILE computer program (by Ensoft, Inc., Version 2013). Program default values may be used for strain factor (E_{50}) and horizontal subgrade reaction (K).

Table 5-3
LPILE Geotechnical Parameters

Depth (feet)	Model P-Y Curve	Effective Unit Weight (lb./ft^3)	Cohesion, c (psf)	Internal Friction Angle, Φ (degrees)
0 to 7	Stiff Clay without Free Water	120	1,100	--
7 to 27	Stiff Clay without Free Water	115	1,800	--
27 to 30	Stiff Clay without Free Water	115	1,500	--
30 to 45	Stiff Clay without Free Water	53	1,500	--

LPILE analyses were performed for the various drilled pier dead end foundations using the LPILE version 2013 computer program (by Ensoft, Inc.). The results were also used to evaluate the Canedo Q value for the site, as discussed below. The results of our LPILE analyses are presented in Appendix C.

5.11.2.2 Canedo "Q" Value

PG&E provided loading information (Shear = 2.5 kips, Vertical = 1.5 kips, and Moment 53 ft.-kips) and dimensions (diameter = 42 inches and depth = 8.5 feet) for the planned dead end structures at the project site for use in our LPILE analysis and Canedo Q calculations for drilled piers.

Kleinfelder evaluated the Canedo “Q” value for design of drilled pier foundations using the PG&E “Steel Structures, Equipment Anchorages and Foundations” substation design criteria dated February, 2013. To determine the Canedo “Q” value for pier design, an LPILE analysis was conducted to evaluate the required embedment depth for the pile loading and diameter case presented above.

Based on our analysis, the computed pile head deflection for planned depth of 8.5 feet is less than 2 percent of the pier diameter, and the computed pier head rotation is less than 0.5 degree. Therefore, the performance of the proposed drilled piers meet the current performance criteria established by PG&E under the given loads.

The recommended Canedo Q value to be used in design is 950 psf/ft for the case described above. A minimum embedment depth of 7 feet is required for a 42 inch diameter drilled pier for the dead-end structure to stay within pier head rotation limits. The results of the LPILE analysis are presented in Appendix C.

5.11.2.3 Lateral Load Resistance

For smaller piers such as those used for fences, when designing drilled piers using CBC Section 1807.3.2.1, lateral loads may be resisted by passive pressure acting against the pier sides and using twice the diameter of the pier, provided they are spaced at least 5 diameters apart (center to center) and a ½ inch deflection at the ground line is tolerable. We recommend an allowable passive pressure value of 160 psf per foot of depth (to be applied over a 2 pier diameter width) for CBC design. The lateral soil bearing pressure should not exceed 1,920 psf.

5.11.2.4 Lateral Response Group Effects

Where drilled piers are spaced at least 8 diameters center-to-center perpendicular to the direction of load, the piers may be assumed to act as individual elements and no additional group action lateral resistance reduction factor is needed. Lateral resistance of each individual pier within a group should be reduced by the factors provided in Table 5-4 below to account for group action effects where the spacing is less than 8 pier diameters. We anticipate piers will be spaced at least 3 diameters center-to-center.

As a general guide, Table 5-4 below may be used to estimate group efficiency factors for a range of pier group configurations and spacings. For group configurations with center-to-center spacings closer than 3 diameters, Kleinfelder should be consulted to evaluate group efficiency on a case-by case basis.

Table 5-4
Recommended Pier Group Efficiency Factors

Groups Having 2 Rows or More Aligned in The Direction of Load				
Center-to-Center Pier Spacing (diameters)	Front Row, Outer	Front Row, Inner	Trailing Rows, Outer	Trailing Rows, Inner
3	0.7	0.5	0.4	0.3
4	0.8	0.6	0.5	0.4
5	0.9	0.7	0.6	0.5
6	1.0	0.8	0.7	0.6
7	1.0	0.9	0.9	0.8
8	1.0	1.0	1.0	1.0

Groups Having 1 Row Aligned in The Direction of Load		
Center-to-Center Pier Spacing (diameters)	Front Pier	Trailing Pier
3	1.0	0.6
4	1.0	0.7
5	1.0	0.8
6	1.0	0.9
7	1.0	1.0
8	1.0	1.0

Group effects should be also be considered where new foundations are constructed adjacent to existing foundations. Once the pier group configurations and loads are established, Kleinfelder would be pleased to review the design and comment on group effects.

5.11.3 Drilled Pier Construction Considerations

The onsite clay soils appear to be favorable for drilled pier construction. However, interbedded silty soils may exist that could be prone to some caving. Caving of the surficial gravels around the pier holes is likely and should be mitigated during construction.

Consistent with the 2013 CBC, drilled pier excavations should be inspected and approved by the geotechnical engineer prior to installation of reinforcement. The depths of all pier excavations should be checked immediately prior to concrete placement to verify excessive sloughing and/or caving has not reduced the required hole depth. This may be done with a weighted tape measure or similar measuring device.

Steel reinforcement and concrete should be placed on the same day of completion of each pier excavation. Additionally, drilled pier excavations should be scheduled to allow concrete in each pile to set over night before drilling adjacent holes that are closer than 4 diameters center-to-center.

Concrete used for drilled pier construction should be discharged vertically into the drilled holes to reduce aggregate segregation. Under no circumstances during pier construction should concrete be allowed to free-fall against either the steel reinforcement or the sides of the excavation. Sufficient space should be provided in the pier reinforcement cage during fabrication to allow the insertion of a pump hose or tremie tube for concrete placement. The pier reinforcement cage should be installed and the concrete pumped immediately after drilling is completed.

In order to develop the design skin friction values provided above, concrete used for drilled pier construction should have a slump ranging from 4 to 6 inches if placed in a dry shaft without temporary casing, and from 6 to 8 inches if temporary casing or slurry drilling methods are used. The concrete mix should be designed with appropriate admixtures and/or water/cement ratios to achieve these recommended slumps. Adding water to a conventional mix to achieve the recommended slump should not be allowed. For concrete mixes with slumps over 6 inches, vibration of the concrete during placement is generally not recommended as aggregate settlement may result in the lack of aggregate within the upper portion of the pile. Careful vibration of the concrete around anchor bolt assemblies is recommended.

If slurry drilling methods are used for drilled pier construction, concrete should be placed into the hole using tremie methods. Tremie concrete placement should be performed in accordance with American Concrete Institute (ACI) 304R. The tremie pipe should be rigid and remain several feet below the surface of the in-place concrete at all times to maintain a seal between the water or slurry and the fresh concrete. The upper concrete seal layer will likely become contaminated with excess water and/or soil as the concrete is placed and should be removed to expose uncontaminated concrete during or immediately following completion of concrete placement. It has been our experience that the concrete seal layer may be on the order of 3 to 5 feet thick but will depend on the pile diameter, amount of water seepage, and construction workmanship.

Concrete used for tremie construction should have a slump of 6 to 8 inches and a minimum cement content of 6 sacks per cubic yard. The concrete mix should be designed with an appropriate water/cement ratio for the design strength and use water reducing/plasticizing admixtures to achieve the recommended slump. Adding water to a conventional mix to achieve the recommended slump should not be allowed. Vibration of pier concrete under water during placement is not recommended as it may result in contamination of the concrete and/or cause aggregate settlement within the pile. Careful vibration of the tops of the piles following removal of the seal layer is recommended to consolidate the concrete around anchor bolt assemblies.

5.11.4 Temporary Casing

If temporary straight-sided steel casing is used for conventional drilled pier construction, we recommend its removal from the hole as concrete is being placed. The bottom of the casing should be maintained below the top of the concrete during casing withdrawal and concrete placement operations. Casing should not be withdrawn until sufficient quantities of concrete have been placed into the excavation to balance the groundwater head outside the casing. Continuous vibration of the casing or other methods may be required to reduce the potential for voids occurring within the concrete mass during casing withdrawal. Casing should not be left in the ground except by permission of the project geotechnical and structural engineers.

5.12 SOIL CORROSION

Kleinfelder has completed laboratory testing to provide data regarding corrosivity of onsite soils. Our scope of services does not include corrosion engineering and, therefore, a detailed analysis of the corrosion test results is not included in this report. A qualified corrosion engineer should be retained to review the test results and design protective systems that may be required. Kleinfelder may be able to provide those services.

Laboratory chloride concentration, sulfate concentration, pH, oxidation reduction potential, redox, sulfide and electrical resistivity tests were performed for a near surface soil sample. The results of the tests are attached and are summarized in Table 5-5. If fill materials will be imported to the project site, similar corrosion potential laboratory testing should be completed on the imported material.

Table 5-5
Chemistry Laboratory Test Results

Boring and Depth	Material	Resistivity, ohm-cm	pH	Oxidation Reduction Potential, mV	Water-Soluble Ion Concentration, ppm		
					Chloride	Sulfide	Sulfate
CPT-02 at 3 ft. and 5 ft.	Lean Clay	3,100	7.44	420	N.D.*	N.D.*	22.0

*N.D. - None Detected

Ferrous metal and concrete elements in contact with soil, whether part of a foundation or part of the supported structure, are subject to degradation due to corrosion or chemical attack. Therefore, buried ferrous metal and concrete elements should be designed to resist corrosion and degradation based on accepted practices.

Based on the “10-point” method developed by the American Water Works Association (AWWA) in standard AWWA C105/A21.5, the soils at the site are not anticipated to be corrosive to buried ferrous metal piping, cast iron pipes, or other objects made of these materials. We recommend that a corrosion engineer be consulted to recommend appropriate protective measures, if required.

The degradation of concrete or cement grout can be caused by chemical agents in the soil or groundwater that react with concrete to either dissolve the cement paste or precipitate larger compounds within the concrete, causing cracking and flaking. The concentration of water-soluble sulfates in the soils is a good indicator of the potential for chemical attack of concrete or cement grout. The American Concrete Institute (ACI) in their publication “Guide to Durable Concrete” (ACI 201.2R-08) provides guidelines for this assessment. The sample had a sulfate concentration of 22.0 parts per million (ppm). The results of sulfate test indicate the potential for deterioration of concrete is mild, no special requirements should be necessary for the concrete mix.

Concrete and the reinforcing steel within it are at risk of corrosion when exposed to water-soluble chloride in the soil or groundwater. Chloride tests did not detect the presence of chloride in the sample. The project structural engineer should review this data to determine if remedial measures are necessary for the concrete reinforcing steel.

6 ADDITIONAL SERVICES

6.1 PLANS AND SPECIFICATIONS REVIEW

Kleinfelder should conduct a general review of plans and specifications to evaluate that the earthwork and foundation recommendations presented in this report have been properly interpreted and implemented during design. In the event Kleinfelder is not retained to perform this recommended review, no responsibility for misinterpretation of the recommendations by Kleinfelder is accepted.

6.2 CONSTRUCTION OBSERVATION AND TESTING

It is recommended that all earthwork and foundation construction be monitored by a representative from Kleinfelder, including site preparation, placement of all engineered fill and trench backfill, construction of slab and pavement subgrade, and all foundation excavations. The purpose of these services is to observe the soil conditions encountered during construction, evaluate the applicability of the recommendations presented in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein.

7 LIMITATIONS

This report presents information for planning, permitting, design, and construction of the switchgears, transformers, circuit breakers, dead end structures, and control building at the new Santa Teresa Substation in San Jose, California. Recommendations contained in this report are based on materials encountered in the field explorations performed for this investigation (CPT-01, CPT-02, and CPT-03), geologic interpretation based on published articles and geotechnical data, and our present knowledge of the proposed construction.

It is possible that soil conditions could vary beyond the points explored. If the scope of the proposed construction, including the proposed location, changes from that described in this report, we should be notified immediately in order that a review may be made and any supplemental recommendations provided.

We have prepared this report in accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our study. No warranty expressed or implied is made.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on-site and off-site) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

8 REFERENCES

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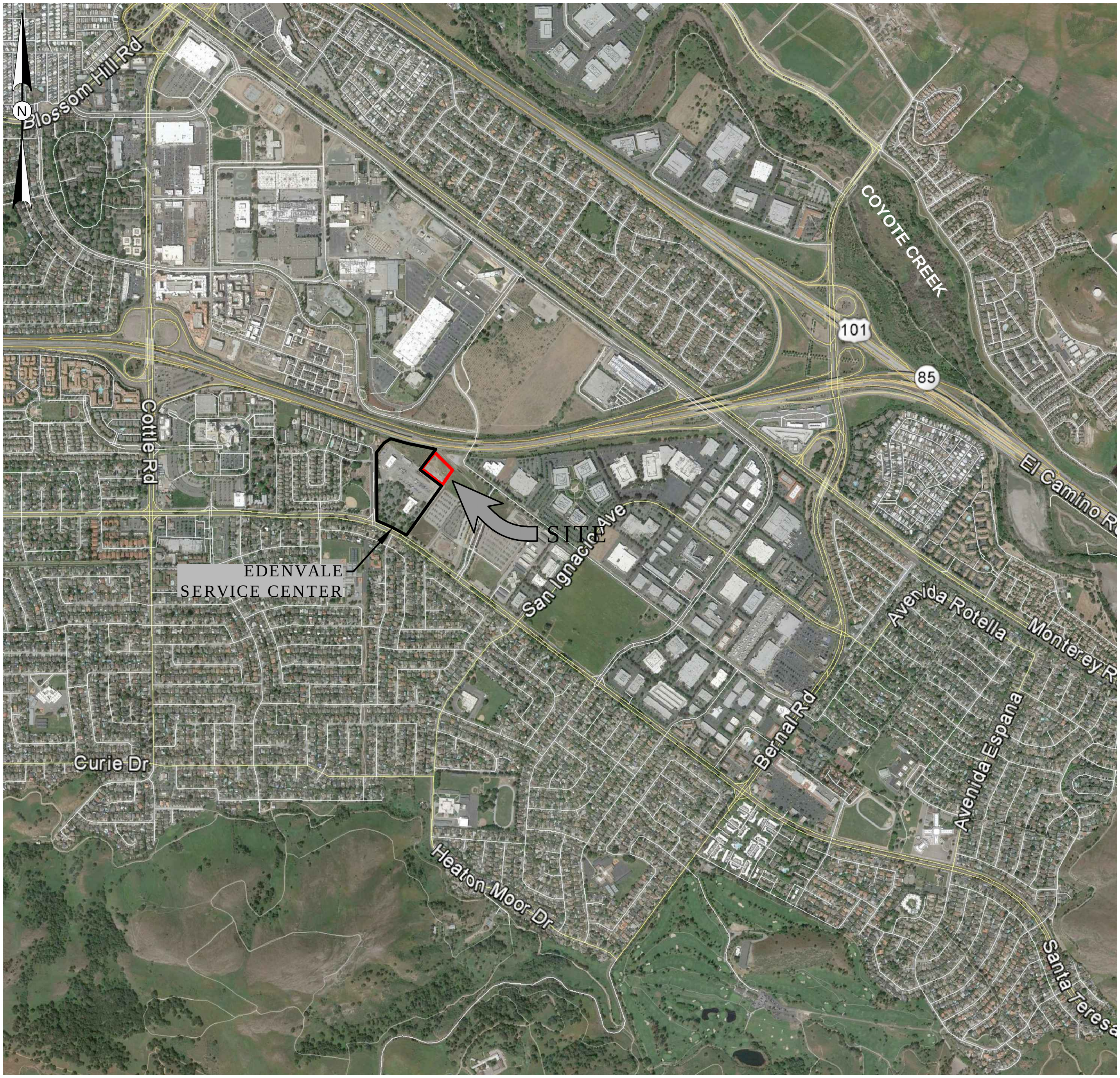
FIGURES

PLOTTED: 1/19/2016 4:19 PM BY: jeff sala



0 2000 4000

SCALE: 1" = 2000' SCALE IN FEET

REFERENCE: Google Earth Pro.,
Imagery date 3-28-2015

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.	20163632
DRAWN BY:	JDS
CHECKED BY:	LS
DATE:	01-19-2016
REVISED:	

SITE VICINITY MAP

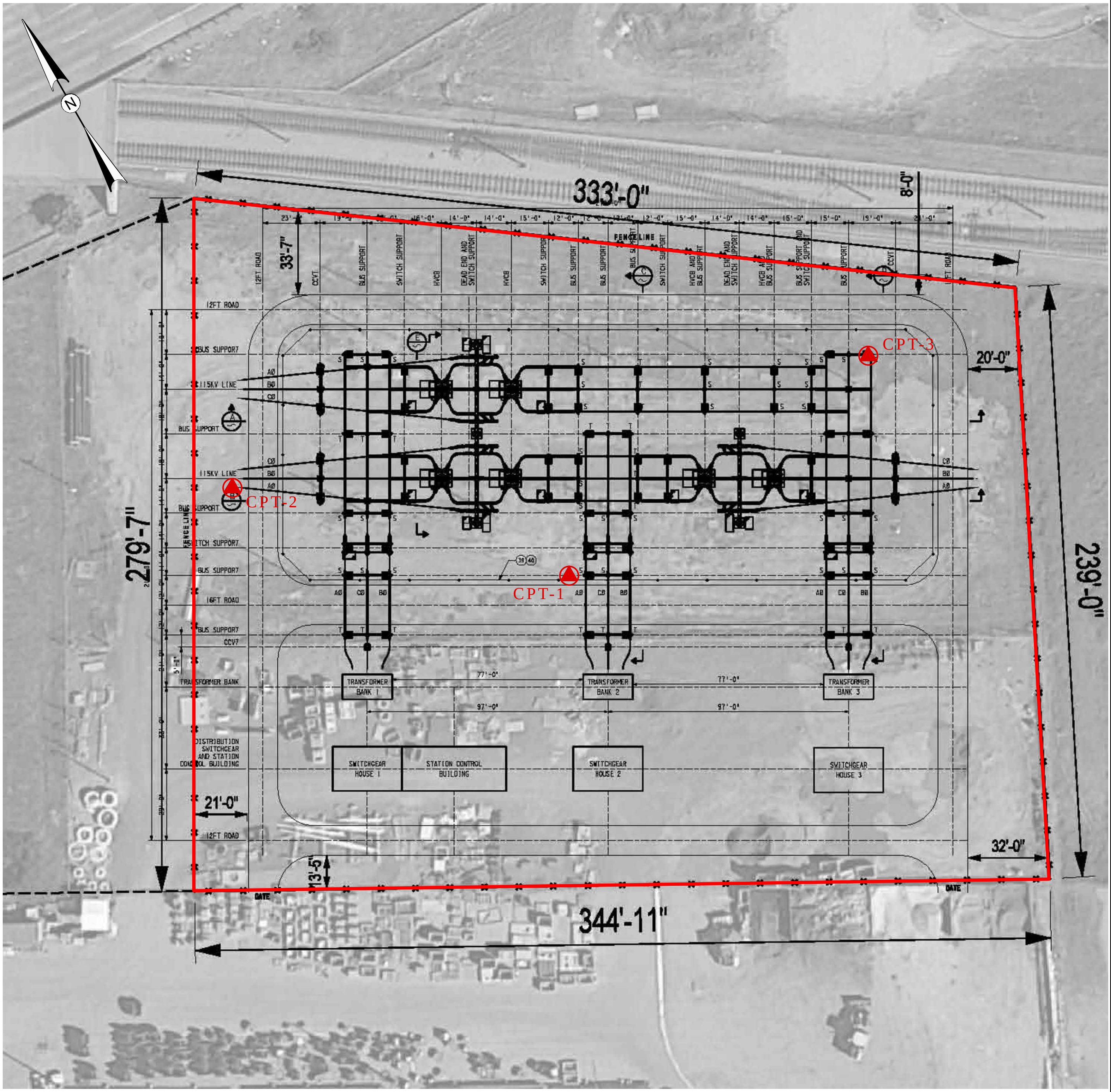
PG&E SANTA TERESA SUBSTATION
6402 SANTA TERESA BOULEVARD
SAN JOSE, CALIFORNIA

FIGURE

1

CAD FILE: L:\2016\Projects\20163632.001A - PG&E Santa Teresa Substation\2.0 Technical Information\GRAPHICS\SITE.dwg

PLOTTED: 1/19/2016 4:20 PM BY: jeff sala



0 60 120

SCALE: 1" = 60' SCALE IN FEET

REFERENCE: Google Earth Pro., Imagery date 5-11-2015;
PG&E Santa Teresa Substation General
Arrangement Outdoors, sheet No. 4106123, no date.

LEGEND

SITE FENCE

CPT-1 CONE PENETRATION TEST
(By Kleinfelder, 12/2015)

NOTE: Locations are approximate.

KLEINFELDER
Bright People. Right Solutions.

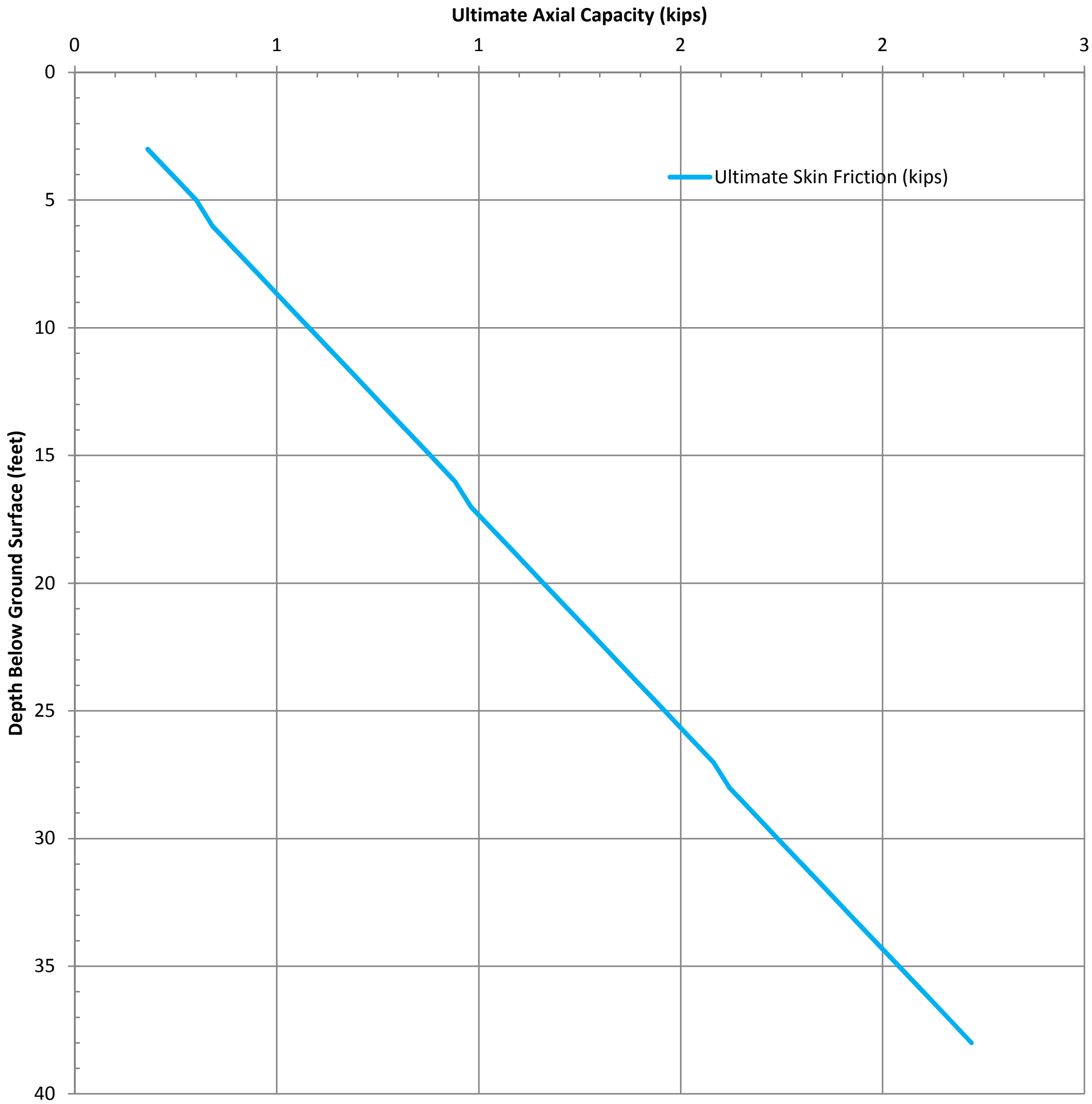
PROJECT NO.	20163632
DRAWN BY:	JDS
CHECKED BY:	LS
DATE:	01-19-2016
REVISED:	

SITE PLAN

PG&E SANTA TERESA SUBSTATION
6402 SANTA TERESA BOULEVARD
SAN JOSE, CALIFORNIA

FIGURE
2

CAD FILE: L:\2016\Projects\20163632.001A - PG&E Santa Teresa Substation\2.0 Technical Information\GRAPHICS\SITE.dwg



Notes:

1. Axial capacities of drilled piers with diameters other than one foot may be obtained by multiplying the unit capacity by the diameter of the pile (in feet).
2. Ultimate tensile capacity may be obtained by multiplying the ultimate compressive capacity by a factor of 0.8.
3. The curve represents ultimate axial capacity of a straight-sided drilled pier. See text discussion for factor of safety and group effects.

KLEINFELDER *Bright People. Right Solutions.*	PROJECT NO.: 20163632 DRAWN BY: BP CHECKED BY: 0 DATE: 1/19/2015 REVISED: 0	ULTIMATE AXIAL CAPACITY UNIT DIAMETER (1-FOOT) DRILLED PIER PG&E SANTA TERESA SUBSTATION 6402 SANTA TERESA BOULEVARD SAN JOSE, CALIFORNIA	FIGURE 3a

Depth (ft)	Ultimate Axial Capacity (kips)	Depth (ft)	Ulitimate Axial Capacity (kips)
3	0.18	23	1.34
4	0.24	24	1.4
5	0.3	25	1.46
6	0.34	26	1.52
7	0.4	27	1.58
8	0.46	28	1.62
9	0.52	29	1.68
10	0.58	30	1.74
11	0.64	31	1.8
12	0.7	32	1.86
13	0.76	33	1.92
14	0.82	34	1.98
15	0.88	35	2.04
16	0.94	36	2.1
17	0.98	37	2.16
18	1.04	38	2.22
19	1.1	39	2.26
20	1.16	40	2.32
21	1.22	41	2.38
22	1.28	42	2.44

Notes:

1. Axial capcities of drilled piers with diameters other than one foot may be obtained by multiplying the unit capacity by the diameter of the pile (in feet).
2. Ultimate tensile capacity may be obtained by multiplying the ultimate compressive capacity by a factor of 0.8.
3. The curve represents ultimate axial capacity of a straight-sided drilled pile. See text discussion for factor of safety and group effects.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20163632	ULTIMATE AXIAL CAPACITY UNIT DIAMETER (1-FOOT) DRILLED PIER	FIGURE	3b
DRAWN BY: BP			
CHECKED BY: 0	PG&E SANTA TERESA SUBSTATION 6402 SANTA TERESA BOULEVARD SAN JOSE, CALIFORNIA		
DATE: 1/19/2015			
REVISED: 0			

APPENDIX A

FIELD EXPLORATION - CPT LOGS

Table A-1
Log of Hand Auger, CPT-1

Depth (feet)	Subsurface Description
0 to 5	Lean Clay (CL), dark reddish brown, moist, hard, low plasticity, trace fine sand, with grass and roots to about 1 inch. Changes to dark brown about 4 feet.

Table A-2
Log of Hand Auger, CPT-2

Depth (feet)	Subsurface Description
0 to ½	Poorly Graded Gravel (GP), Gray, moist, max diameter about ¾ inch (FILL)
½ to 1	Gravelly Lean Clay (CL), dark reddish brown, moist, hard, low plasticity (FILL)
1 to 5	Lean Clay (CL), dark reddish brown, moist, hard, low plasticity, trace fine sand

Table A-3
Log of Hand Auger, CPT-3

Depth (feet)	Subsurface Description
0 to ¼	Poorly Graded Gravel (GP), Gray, moist, max diameter about ¾ inch (FILL)
¼ to ½	Gravelly Lean Clay (CL), dark reddish brown, moist, hard, low plasticity (FILL)
½ to 5	Lean Clay (CL), dark reddish brown, moist, hard, low plasticity, trace fine sand Changes to brown at about 3.5 feet.

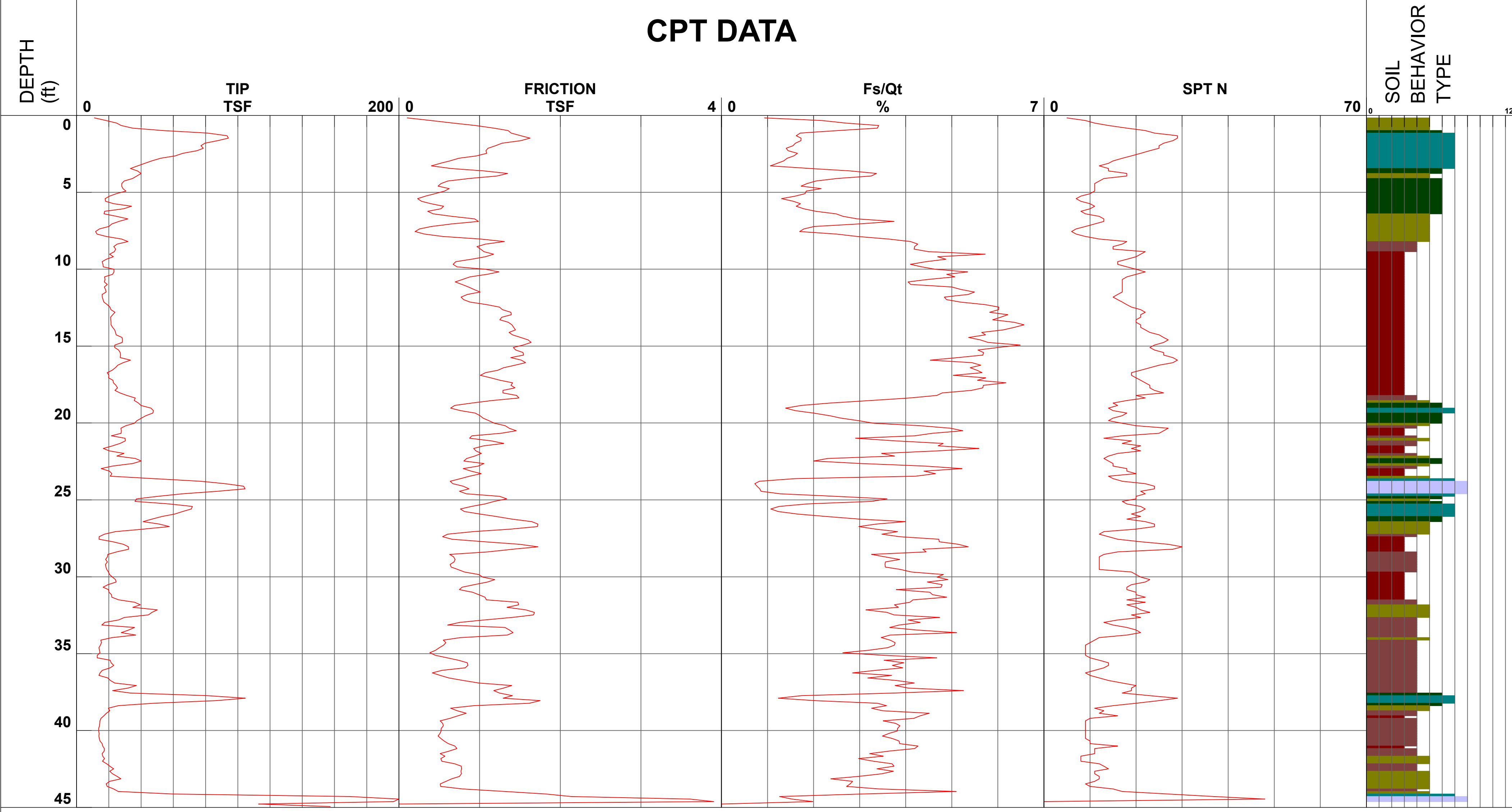
Note that due to the hand augering process, the upper 5 feet of the CPT log should be disregarded.

Kleinfelder Inc

Project	6402 Santa Teresa	Operator	CB	Filename	SDF(367).cpt
Job Number	MP160982.001	Cone Number	DDG1281	GPS	
Hole Number	CPT-01	Date and Time	12/28/2015 3:52:55 PM	Maximum Depth	44.95 ft
EST GW Depth During Test		>45.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

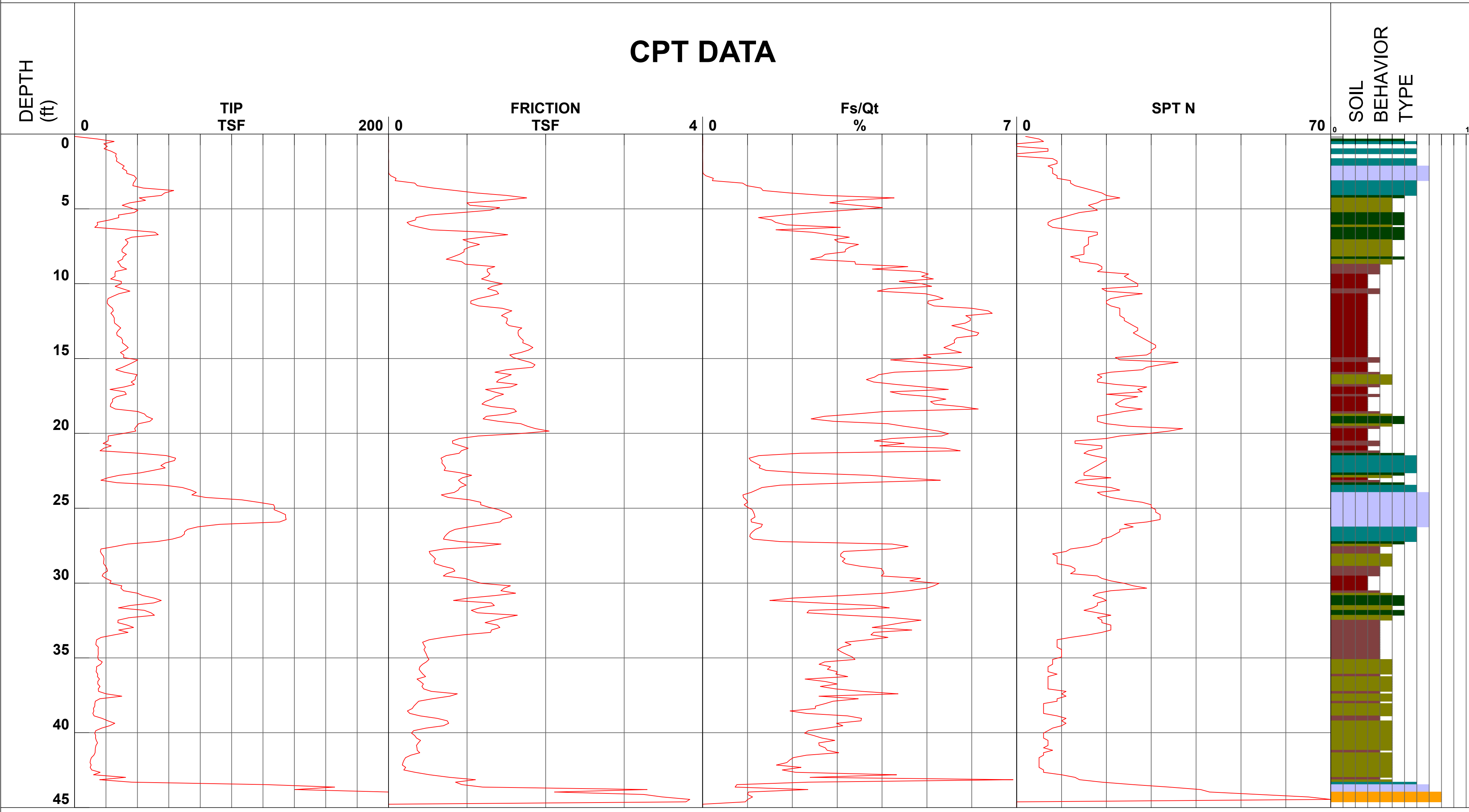
S*Soil behavior type and SPT based on data from UBC-1983

Kleinfelder Inc

Project	6402 Santa Teresa	Operator	CB	Filename	SDF(365).cpt
Job Number		Cone Number	DDG1281	GPS	
Hole Number	CPT-02	Date and Time	12/28/2015 2:33:32 PM	Maximum Depth	44.95 ft
EST GW Depth During Test		>45.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

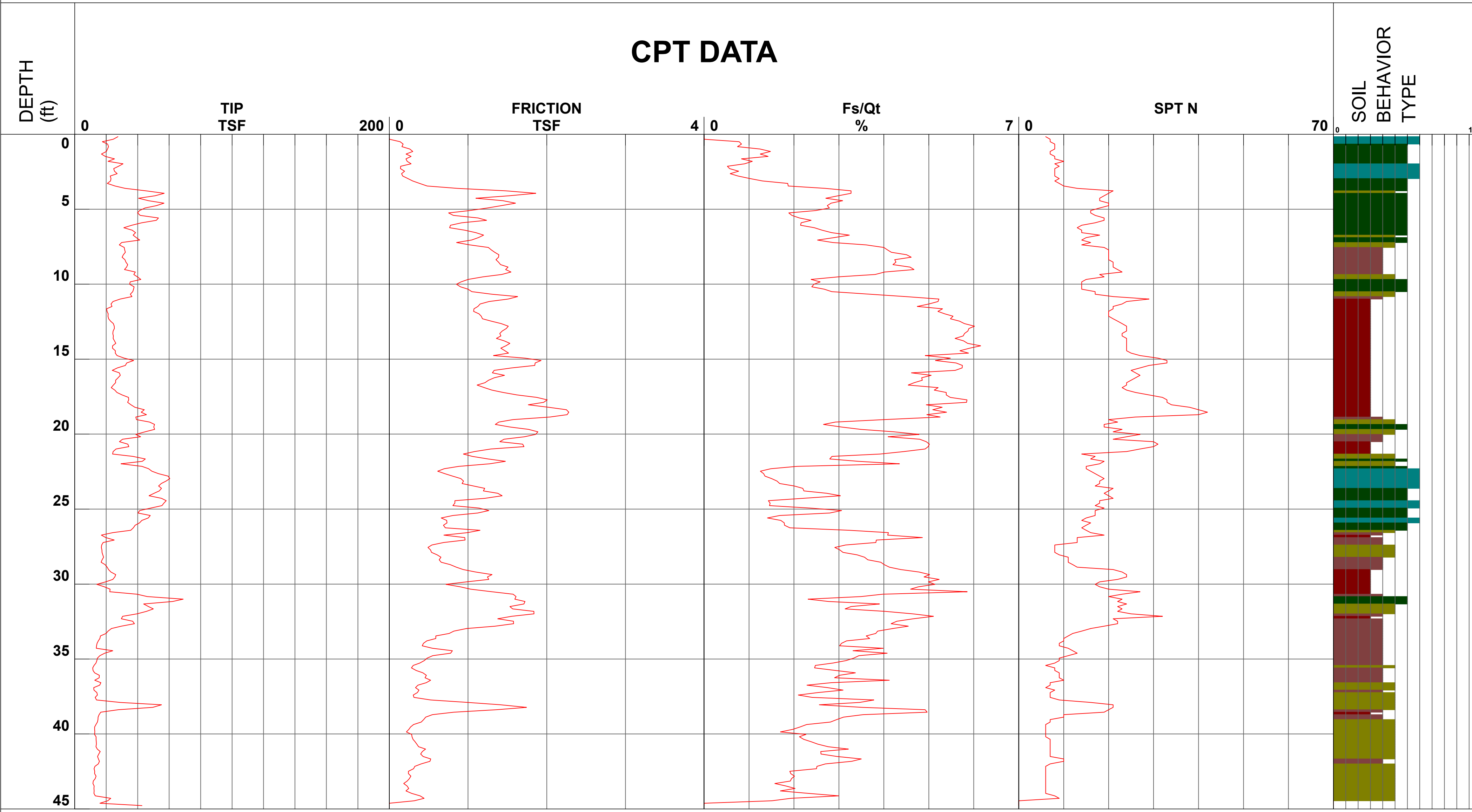
Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Kleinfelder Inc

Project	6402 Santa Teresa	Operator	CB	Filename	SDF(366).cpt
Job Number		Cone Number	DDG1281	GPS	
Hole Number	CPT-03	Date and Time	12/28/2015 3:11:06 PM	Maximum Depth	44.78 ft
EST GW Depth During Test			>45.00 ft		

Net Area Ratio .8



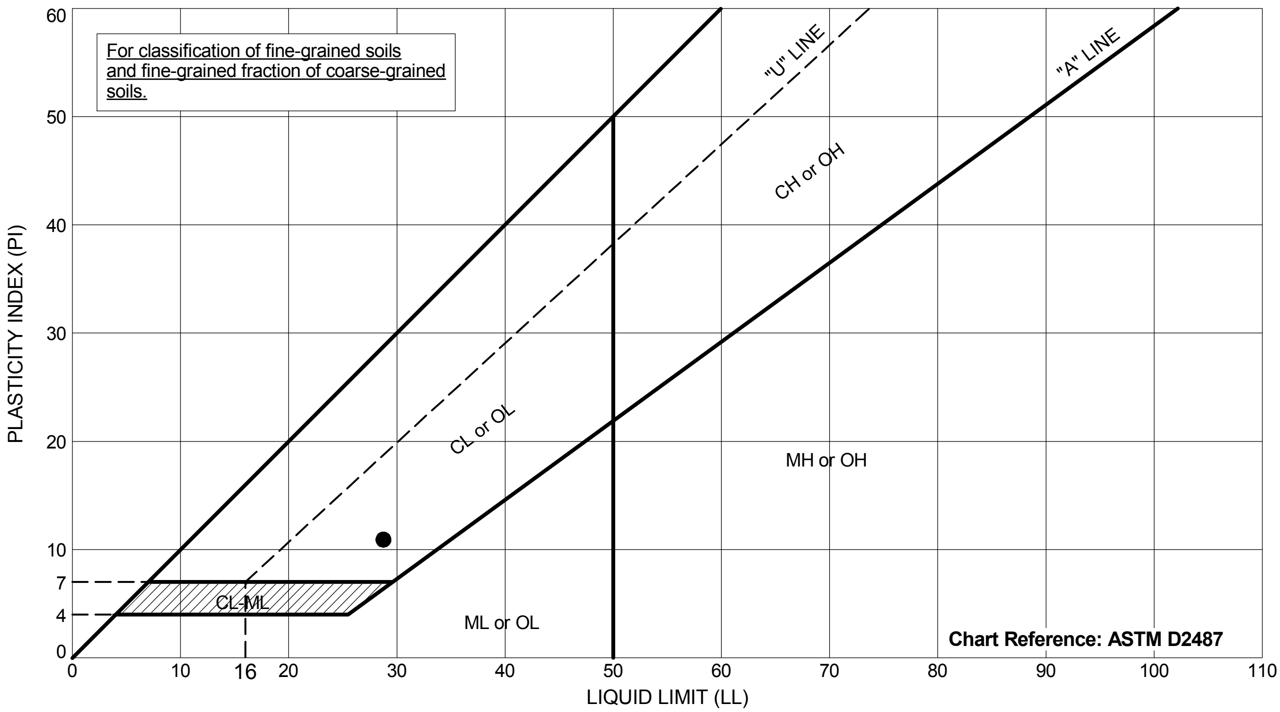
- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

APPENDIX B

LABORATORY TEST RESULTS



	Exploration ID	Depth (ft.)	Sample Description	Passing #200	LL	PL	PI
●	CPT-1	1	DARK BROWN LEAN CLAY (CL)	NM	29	18	11

Testing perfomed in general accordance with ASTM D4318.
NP = Nonplastic
NM = Not Measured

KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20163632 DRAWN BY: CP CHECKED BY: CP DATE: 1/8/2016 REVISED: -	ATTERBERG LIMITS PG&E SANTA TERESA 6402 SANTA TERESA BOULEVARD SAN JOSE, CALIFORNIA	B-1

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

Client: Kleinfelder
Client's Project No.: 20163632.001A
Client's Project Name: PG&E - Santa Teresa
Date Sampled: 5-Jan-2016
Date Received: 7-Jan-2016
Matrix: Soil
Authorization: Signed Chain of Custody

Date of Report: 15-Jan-2016

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Resistivity (As Received) (ohms-cm)	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
1601075-001	CP-2, 2 @ 3' & 5'	+420	7.44	16,000	3,100	N.D.	N.D.	22

Method:	ASTM D1498	ASTM D4972	ASTM G57	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	-	-	50	15	15
Date Analyzed:	13-Jan-2016	13-Jan-2016	13-Jan-2016	13-Jan-2016	12-Jan-2016	14-Jan-2016	14-Jan-2016

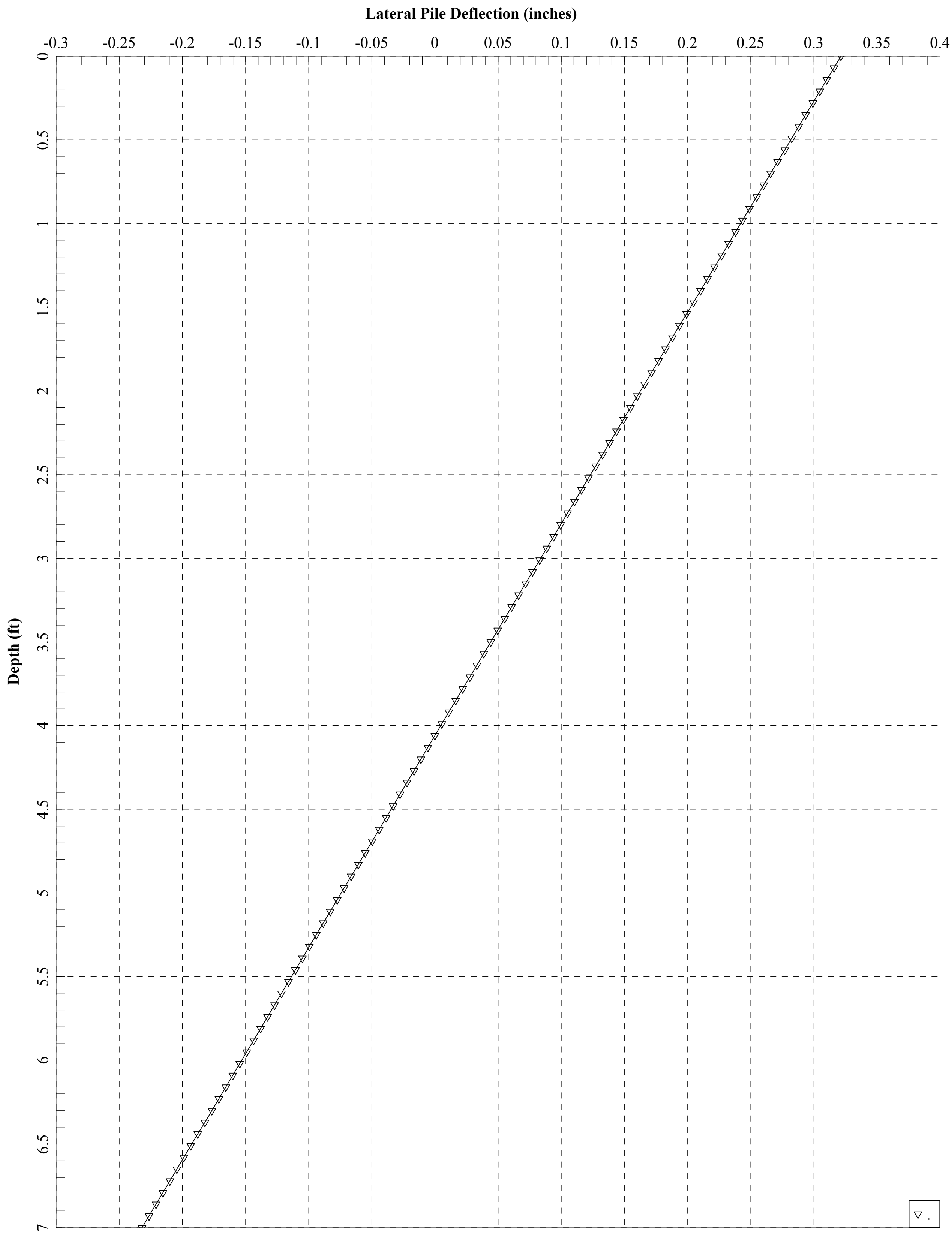
* Results Reported on "As Received" Basis
N.D. - None Detected

Cheryl McMillen
Laboratory Director

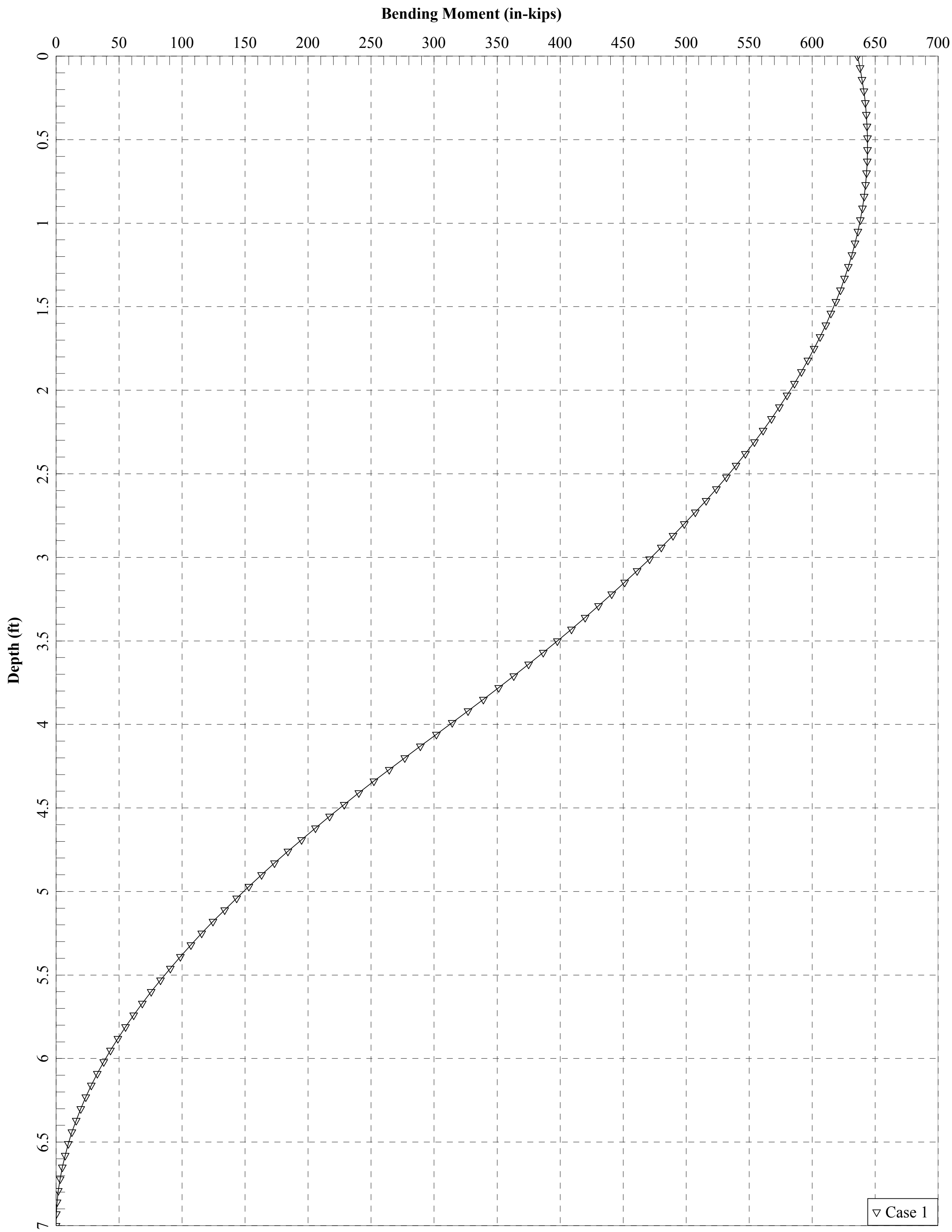
Quality Control Summary - All laboratory quality control parameters were found to be within established limits

APPENDIX C

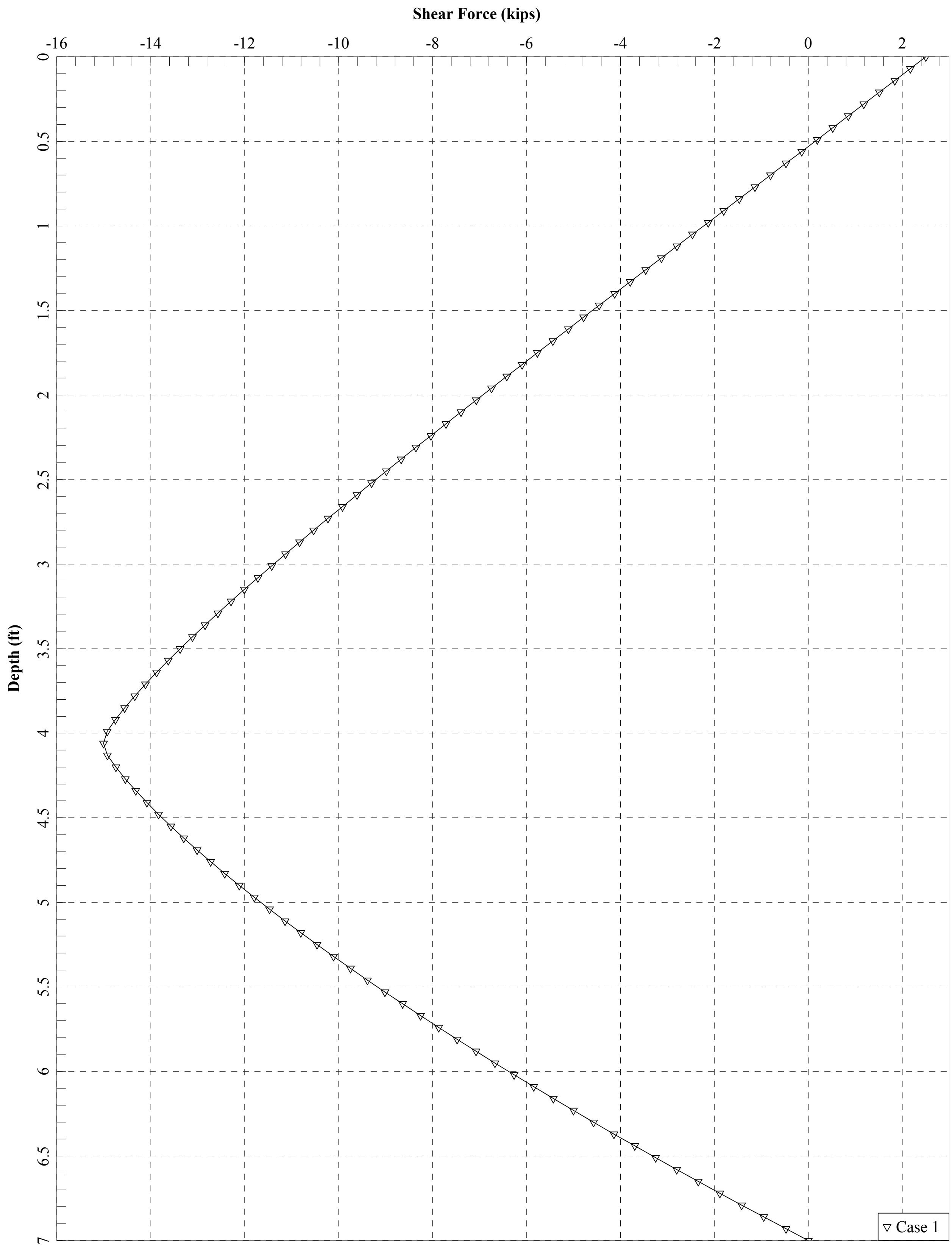
LPILE ANALYSIS RESULTS



3.5-Foot Diameter



3.5-Foot Diameter



3.5-Foot Diameter

```
================================================================================

                  LPile Plus for Windows, Version 2013-07.007

                Analysis of Individual Piles and Drilled Shafts
               Subjected to Lateral Loading Using the p-y Method
```



```
================================================================================

This copy of LPile is used by:

Kleinfelder
Pleasanton

Serial Number of Security Device:  239146276
This copy of LPile is licensed for exclusive use by:  Kleinfelder, Various, Global Lic

Use of this program by any entity other than Kleinfelder, Various, Global Lic
is forbidden by the software license agreement.


--------------------------------------------------------------------------------
                            Files Used for Analysis
--------------------------------------------------------------------------------

Path to file locations:        B:\2016\PG&E\PG&E Geo\Santa Teresa Substation\LPile\
Name of input data file:       PG&E Santa Teresa Substation.lp7d
Name of output report file:    PG&E Santa Teresa Substation.lp7o
Name of plot output file:      PG&E Santa Teresa Substation.lp7p
Name of runtime messeage file: PG&E Santa Teresa Substation.lp7r


--------------------------------------------------------------------------------
                           Date and Time of Analysis
--------------------------------------------------------------------------------

               Date:  January 19, 2016     Time:  17:03:03


--------------------------------------------------------------------------------
                                 Problem Title
--------------------------------------------------------------------------------

Project Name: PG&E Santa Teresa Substation


Job Number: 20163632.001A


Client: PG&E


Engineer: B.Price


Description:




--------------------------------------------------------------------------------
                           Program Options and Settings
--------------------------------------------------------------------------------

Engineering Units of Input Data and Computations:
 - Engineering units are US Customary Units (pounds, feet, inches)
```

Analysis Control Options:
- Maximum number of iterations allowed = 500
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 100.0000 in
- Number of pile increments = 100

Loading Type and Number of Cycles of Loading:
- Static loading specified

Computational Options:
- Use unfactored loads in computations (conventional analysis)
- Compute pile response under loading and nonlinear bending properties of pile (only if nonlinear pile properties are input)
- Use of p-y modification factors for p-y curves not selected
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:
- No p-y curves to be computed and reported for user-specified depths
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1

Pile Structural Properties and Geometry

Total number of pile sections = 1

Total length of pile = 7.00 ft

Depth of ground surface below top of pile = 0.00 ft

Pile diameter values used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile.

Point	Depth X ft	Pile Diameter in
1	0.00000	42.0000000
2	7.000000	42.0000000

Input Structural Properties:

Pile Section No. 1:

- Section Type = Elastic Pile
- Cross-sectional Shape = Circular
- Section Length = 7.00000 ft
- Top Width = 42.00000 in
- Bottom Width = 42.00000 in
- Top Area = 1385.44236 Sq. in
- Bottom Area = 1385.44236 Sq. in
- Moment of Inertia at Top = 152745. in^4
- Moment of Inertia at Bottom = 152745. in^4
- Elastic Modulus = 3600000. lbs/in^2

Ground Slope and Pile Batter Angles

```
Ground Slope Angle                                    =       0.000 degrees
                                                      =       0.000 radians

Pile Batter Angle                                     =       0.000 degrees
                                                      =       0.000 radians


--------------------------------------------------------------------------------
                       Soil and Rock Layering Information
--------------------------------------------------------------------------------

The soil profile is modelled using 4 layers

Layer 1 is stiff clay without free water

   Distance from top of pile to top of layer          =      0.0000 ft
   Distance from top of pile to bottom of layer       =     7.00000 ft
   Effective unit weight at top of layer              =   120.00000 pcf
   Effective unit weight at bottom of layer           =   120.00000 pcf
   Undrained cohesion at top of layer                 =  1100.00000 psf
   Undrained cohesion at bottom of layer              =  1100.00000 psf
   Epsilon-50 at top of layer                         =      0.0000
   Epsilon-50 at bottom of layer                      =      0.0000

   NOTE: Internal default values for Epsilon-50 will be computed for this soil layer.

Layer 2 is stiff clay without free water

   Distance from top of pile to top of layer          =     7.00000 ft
   Distance from top of pile to bottom of layer       =    27.00000 ft
   Effective unit weight at top of layer              =   115.00000 pcf
   Effective unit weight at bottom of layer           =   115.00000 pcf
   Undrained cohesion at top of layer                 =  1800.00000 psf
   Undrained cohesion at bottom of layer              =  1800.00000 psf
   Epsilon-50 at top of layer                         =      0.0000
   Epsilon-50 at bottom of layer                      =      0.0000

   NOTE: Internal default values for Epsilon-50 will be computed for this soil layer.

Layer 3 is stiff clay without free water

   Distance from top of pile to top of layer          =    27.00000 ft
   Distance from top of pile to bottom of layer       =    30.00000 ft
   Effective unit weight at top of layer              =   115.00000 pcf
   Effective unit weight at bottom of layer           =   115.00000 pcf
   Undrained cohesion at top of layer                 =  1500.00000 psf
   Undrained cohesion at bottom of layer              =  1500.00000 psf
   Epsilon-50 at top of layer                         =      0.0000
   Epsilon-50 at bottom of layer                      =      0.0000

   NOTE: Internal default values for Epsilon-50 will be computed for this soil layer.

Layer 4 is stiff clay with water-induced erosion

   Distance from top of pile to top of layer          =    30.00000 ft
   Distance from top of pile to bottom of layer       =    45.00000 ft
   Effective unit weight at top of layer              =    52.60000 pcf
   Effective unit weight at bottom of layer           =    52.60000 pcf
   Undrained cohesion at top of layer                 =  1500.00000 psf
   Undrained cohesion at bottom of layer              =  1500.00000 psf
   Epsilon-50 at top of layer                         =      0.0000
   Epsilon-50 at bottom of layer                      =      0.0000
   Subgrade k at top of layer                         =      0.0000 pci
   Subgrade k at bottom of layer                      =      0.0000 pci

   NOTE: Internal default values for Epsilon-50 will be computed for this soil layer.

   NOTE: Internal default values for subgrade k will be computed for this soil layer.
```

(Depth of lowest soil layer extends 38.00 ft below pile tip)

Summary of Soil Properties

Layer Num.	Layer Soil Type (p-y Curve Criteria)	Layer Depth ft	Effective Unit Wt. pcf	Undrained Cohesion psf	Strain Factor Epsilon 50	kpy pci
1	Stiff Clay w/o Free Water	0.00	120.000	1100.000	default	--
		7.000	120.000	1100.000	default	--
2	Stiff Clay w/o Free Water	7.000	115.000	1800.000	default	--
		27.000	115.000	1800.000	default	--
3	Stiff Clay w/o Free Water	27.000	115.000	1500.000	default	--
		30.000	115.000	1500.000	default	--
4	Stiff Clay with Free Water	30.000	52.600	1500.000	default	default
		45.000	52.600	1500.000	default	default

Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 2500.00000 lbs	M = 636000. in-lbs	0.0000000	No

V = perpendicular shear force applied to pile head
M = bending moment applied to pile head
y = lateral deflection relative to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applie to pile head
Axial thrust is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic section properties

---

PG&E Santa Teresa Substation.lp7o
Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 2500.0 lbs
Applied moment at pile head = 636000.0 in-lbs
Axial thrust load on pile head = 0.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil Res. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.3215	636000.	2500.0000	-0.006626	87.4398	5.499E+11	-391.3734	511.3315	0.000
0.07000	0.3159	637962.	2170.9988	-0.006625	87.7096	5.499E+11	-391.9592	1042.2370	0.000
0.140	0.3103	639647.	1841.5266	-0.006624	87.9413	5.499E+11	-392.5023	1062.3944	0.000
0.210	0.3048	641056.	1511.6150	-0.006623	88.1349	5.499E+11	-393.0015	1083.1642	0.000
0.280	0.2992	642187.	1181.3030	-0.006622	88.2904	5.499E+11	-393.4557	1104.5770	0.000
0.350	0.2937	643040.	850.6288	-0.006621	88.4078	5.499E+11	-393.8637	1126.6656	0.000
0.420	0.2881	643616.	519.6320	-0.006620	88.4869	5.499E+11	-394.2242	1149.4653	0.000
0.490	0.2825	643913.	188.3528	-0.006619	88.5278	5.499E+11	-394.5357	1173.0138	0.000
0.560	0.2770	643932.	-143.1670	-0.006618	88.5304	5.499E+11	-394.7971	1197.3518	0.000
0.630	0.2714	643673.	-474.8845	-0.006617	88.4947	5.499E+11	-395.0066	1222.5228	0.000
0.700	0.2659	643134.	-806.7556	-0.006616	88.4207	5.499E+11	-395.1628	1248.5740	0.000
0.770	0.2603	642317.	-1138.7348	-0.006615	88.3084	5.499E+11	-395.2639	1275.5561	0.000
0.840	0.2547	641221.	-1470.7751	-0.006614	88.1577	5.499E+11	-395.3083	1303.5240	0.000
0.910	0.2492	639846.	-1802.8281	-0.006613	87.9687	5.499E+11	-395.2941	1332.5371	0.000
0.980	0.2436	638193.	-2134.8438	-0.006612	87.7413	5.499E+11	-395.2193	1362.6600	0.000
1.050	0.2381	636260.	-2466.7703	-0.006611	87.4756	5.499E+11	-395.0819	1393.9625	0.000
1.120	0.2325	634048.	-2798.5540	-0.006610	87.1715	5.499E+11	-394.8795	1426.5210	0.000
1.190	0.2270	631558.	-3130.1396	-0.006609	86.8292	5.499E+11	-394.6100	1460.4186	0.000
1.260	0.2214	628790.	-3461.4695	-0.006608	86.4486	5.499E+11	-394.2707	1495.7462	0.000
1.330	0.2159	625743.	-3792.4839	-0.006607	86.0297	5.499E+11	-393.8590	1532.6033	0.000
1.400	0.2103	622418.	-4123.1211	-0.006606	85.5726	5.499E+11	-393.3721	1571.0993	0.000
1.470	0.2048	618816.	-4453.3163	-0.006605	85.0773	5.499E+11	-392.8069	1611.3545	0.000
1.540	0.1992	614937.	-4783.0025	-0.006604	84.5440	5.499E+11	-392.1602	1653.5016	0.000
1.610	0.1937	610781.	-5112.1096	-0.006603	83.9726	5.499E+11	-391.4283	1697.6876	0.000
1.680	0.1881	606349.	-5440.5647	-0.006603	83.3632	5.499E+11	-390.6077	1744.0754	0.000
1.750	0.1826	601641.	-5768.2914	-0.006602	82.7160	5.499E+11	-389.6940	1792.8463	0.000
1.820	0.1770	596658.	-6095.2099	-0.006601	82.0309	5.499E+11	-388.6830	1844.2028	0.000
1.890	0.1715	591401.	-6421.2361	-0.006600	81.3081	5.499E+11	-387.5699	1898.3716	0.000
1.960	0.1660	585870.	-6746.2822	-0.006599	80.5478	5.499E+11	-386.3495	1955.6076	0.000
2.030	0.1604	580067.	-7070.2557	-0.006598	79.7499	5.499E+11	-385.0160	2016.1984	0.000
2.100	0.1549	573992.	-7393.0590	-0.006597	78.9147	5.499E+11	-383.5634	2080.4698	0.000
2.170	0.1493	567647.	-7714.5892	-0.006596	78.0423	5.499E+11	-381.9848	2148.7927	0.000
2.240	0.1438	561032.	-8034.7373	-0.006595	77.1329	5.499E+11	-380.2727	2221.5908	0.000
2.310	0.1382	554148.	-8353.3877	-0.006595	76.1865	5.499E+11	-378.4189	2299.3510	0.000
2.380	0.1327	546998.	-8670.4177	-0.006594	75.2035	5.499E+11	-376.4143	2382.6359	0.000
2.450	0.1272	539582.	-8985.6961	-0.006593	74.1839	5.499E+11	-374.2486	2472.0988	0.000
2.520	0.1216	531902.	-9299.0830	-0.006592	73.1280	5.499E+11	-371.9106	2568.5036	0.000
2.590	0.1161	523959.	-9610.4281	-0.006591	72.0361	5.499E+11	-369.3873	2672.7496	0.000
2.660	0.1106	515756.	-9919.5697	-0.006590	70.9083	5.499E+11	-366.6643	2785.9035	0.000
2.730	0.1050	507295.	-10226.	-0.006590	69.7449	5.499E+11	-363.7251	2909.2403	0.000
2.800	0.0995	498576.	-10531.	-0.006589	68.5463	5.499E+11	-360.5510	3044.2990	0.000
2.870	0.0940	489603.	-10832.	-0.006588	67.3126	5.499E+11	-357.1202	3192.9546	0.000
2.940	0.0884	480378.	-11130.	-0.006587	66.0444	5.499E+11	-353.4075	3357.5180	0.000
3.010	0.0829	470904.	-11426.	-0.006587	64.7418	5.499E+11	-349.3833	3540.8722	0.000
3.080	0.0774	461184.	-11717.	-0.006586	63.4054	5.499E+11	-345.0125	3746.6651	0.000
3.150	0.0718	451219.	-12005.	-0.006585	62.0355	5.499E+11	-340.2531	3979.5860	0.000
3.220	0.0663	441015.	-12289.	-0.006585	60.6325	5.499E+11	-335.0541	4245.7741	0.000
3.290	0.0608	430575.	-12568.	-0.006584	59.1971	5.499E+11	-329.3524	4553.4377	0.000
3.360	0.0552	419901.	-12842.	-0.006583	57.7297	5.499E+11	-323.0689	4913.8258	0.000
3.430	0.0497	409000.	-13110.	-0.006583	56.2310	5.499E+11	-316.1020	5342.8127	0.000
3.500	0.0442	397876.	-13372.	-0.006582	54.7017	5.499E+11	-308.3182	5863.6072	0.000
3.570	0.0386	386535.	-13628.	-0.006581	53.1424	5.499E+11	-299.5357	6511.6524	0.000
3.640	0.0331	374982.	-13875.	-0.006581	51.5540	5.499E+11	-289.4976	7344.1438	0.000
3.710	0.0276	363225.	-14113.	-0.006580	49.9376	5.499E+11	-277.8211	8460.2764	0.000
3.780	0.0221	351271.	-14341.	-0.006580	48.2942	5.499E+11	-263.8937	10050.	0.000
3.850	0.0165	339132.	-14555.	-0.006579	46.6252	5.499E+11	-246.6300	12533.	0.000

3.920	0.0110	326818.	-14753.	-0.006579	44.9323	5.499E+11	-223.7630	17081.	0.000
3.990	0.005478	314347.	-14926.	-0.006578	43.2177	5.499E+11	-188.7880	28949.	0.000
4.060	-4.742E-05	301743.	-15003.	-0.006578	41.4848	5.499E+11	6.6989	118655.	0.000
4.130	-0.005573	289143.	-14919.	-0.006577	39.7525	5.499E+11	191.2663	28831.	0.000
4.200	-0.0111	276678.	-14743.	-0.006577	38.0388	5.499E+11	228.2027	17274.	0.000
4.270	-0.0166	264374.	-14541.	-0.006576	36.3472	5.499E+11	253.5529	12814.	0.000
4.340	-0.0221	252249.	-14320.	-0.006576	34.6802	5.499E+11	273.5883	10377.	0.000
4.410	-0.0277	240317.	-14083.	-0.006576	33.0398	5.499E+11	290.4974	8819.0712	0.000
4.480	-0.0332	228590.	-13832.	-0.006575	31.4275	5.499E+11	305.3251	7726.7841	0.000
4.550	-0.0387	217079.	-13570.	-0.006575	29.8448	5.499E+11	318.6582	6913.7831	0.000
4.620	-0.0442	205792.	-13298.	-0.006575	28.2931	5.499E+11	330.8619	6282.3785	0.000
4.690	-0.0498	194739.	-13015.	-0.006574	26.7735	5.499E+11	342.1800	5776.2083	0.000
4.760	-0.0553	183927.	-12723.	-0.006574	25.2870	5.499E+11	352.7838	5360.3372	0.000
4.830	-0.0608	173364.	-12422.	-0.006574	23.8348	5.499E+11	362.7987	5011.8883	0.000
4.900	-0.0663	163057.	-12114.	-0.006574	22.4178	5.499E+11	372.3194	4715.2166	0.000
4.970	-0.0718	153013.	-11797.	-0.006573	21.0369	5.499E+11	381.4193	4459.2384	0.000
5.040	-0.0774	143238.	-11473.	-0.006573	19.6930	5.499E+11	390.1565	4235.8688	0.000
5.110	-0.0829	133738.	-11142.	-0.006573	18.3869	5.499E+11	398.5777	4039.0635	0.000
5.180	-0.0884	124520.	-10804.	-0.006573	17.1195	5.499E+11	406.7212	3864.2078	0.000
5.250	-0.0939	115588.	-10459.	-0.006572	15.8916	5.499E+11	414.6187	3707.7136	0.000
5.320	-0.0995	106950.	-10107.	-0.006572	14.7039	5.499E+11	422.2969	3566.7468	0.000
5.390	-0.1050	98609.	-9749.2148	-0.006572	13.5571	5.499E+11	429.7783	3439.0373	0.000
5.460	-0.1105	90571.	-9385.1333	-0.006572	12.4520	5.499E+11	437.0823	3322.7436	0.000
5.530	-0.1160	82842.	-9014.9841	-0.006572	11.3894	5.499E+11	444.2254	3216.3560	0.000
5.600	-0.1215	75426.	-8638.8962	-0.006572	10.3698	5.499E+11	451.2221	3118.6239	0.000
5.670	-0.1271	68328.	-8256.9873	-0.006572	9.3940	5.499E+11	458.0850	3028.5020	0.000
5.740	-0.1326	61554.	-7869.3650	-0.006572	8.4627	5.499E+11	464.8252	2945.1097	0.000
5.810	-0.1381	55108.	-7476.1283	-0.006571	7.5764	5.499E+11	471.4525	2867.6993	0.000
5.880	-0.1436	48994.	-7077.3685	-0.006571	6.7359	5.499E+11	477.9757	2795.6318	0.000
5.950	-0.1491	43218.	-6673.1696	-0.006571	5.9417	5.499E+11	484.4026	2728.3575	0.000
6.020	-0.1547	37783.	-6263.6097	-0.006571	5.1946	5.499E+11	490.7400	2665.4010	0.000
6.090	-0.1602	32695.	-5848.7612	-0.006571	4.4950	5.499E+11	496.9944	2606.3485	0.000
6.160	-0.1657	27957.	-5428.6916	-0.006571	3.8437	5.499E+11	503.1713	2550.8385	0.000
6.230	-0.1712	23575.	-5003.4638	-0.006571	3.2411	5.499E+11	509.2759	2498.5535	0.000
6.300	-0.1767	19551.	-4573.1365	-0.006571	2.6880	5.499E+11	515.3129	2449.2134	0.000
6.370	-0.1823	15892.	-4137.7647	-0.006571	2.1849	5.499E+11	521.2866	2402.5702	0.000
6.440	-0.1878	12600.	-3697.4001	-0.006571	1.7323	5.499E+11	527.2008	2358.4035	0.000
6.510	-0.1933	9680.1330	-3252.0909	-0.006571	1.3309	5.499E+11	533.0591	2316.5165	0.000
6.580	-0.1988	7136.4399	-2801.8829	-0.006571	0.9811	5.499E+11	538.8648	2276.7332	0.000
6.650	-0.2043	4972.9698	-2346.8189	-0.006571	0.6837	5.499E+11	544.6210	2238.8955	0.000
6.720	-0.2099	3193.7843	-1886.9393	-0.006571	0.4391	5.499E+11	550.3303	2202.8611	0.000
6.790	-0.2154	1802.9118	-1422.2825	-0.006571	0.2479	5.499E+11	555.9955	2168.5012	0.000
6.860	-0.2209	804.3496	-952.8846	-0.006571	0.1106	5.499E+11	561.6188	2135.6995	0.000
6.930	-0.2264	202.0657	-478.7795	-0.006571	0.0278	5.499E+11	567.2025	2104.3503	0.000
7.000	-0.2319	0.000	0.000	-0.006571	0.000	5.499E+11	572.7487	1037.1786	0.000

* The above values of total stress are combined axial and bending stresses.

Output Summary for Load Case No. 1:

```
Pile-head deflection              =      0.3214682 inches
Computed slope at pile head       =     -0.0066258 radians
Maximum bending moment            =        643932. inch-lbs
Maximum shear force               =        -15003. lbs
Depth of maximum bending moment   =      0.5600000 feet below pile head
Depth of maximum shear force      =      4.0600000 feet below pile head
Number of iterations              =             39
Number of zero deflection points  =              1
```

Summary of Pile Response(s)

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, lbs, and Load 2 = Moment, in-lbs
Load Type 2: Load 1 = Shear, lbs, and Load 2 = Slope, radians
Load Type 3: Load 1 = Shear, lbs, and Load 2 = Rotational Stiffness, in-lbs/radian
Load Type 4: Load 1 = Top Deflection, inches, and Load 2 = Moment, in-lbs
Load Type 5: Load 1 = Top Deflection, inches, and Load 2 = Slope, radians

Load Case No.	Load Type No.	Pile-head Condition 1 V(lbs) or y(inches)	Pile-head Condition 2 in-lb, rad., or in-lb/rad.	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in Pile in-lbs	Maximum Shear in Pile lbs	Pile-head Rotation radians
1	1	V = 2500.0000	M = 636000.	0.0000000	0.32146820	643932.	-15003.	-0.00662579

The analysis ended normally.

APPENDIX D

GBA INFORMATION SHEET

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GBC GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

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Report of Phase I Environmental Site Assessment

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Project No. 8415180020

Report of Phase I Environmental Site Assessment
Great Oaks Boulevard Parcels
San Jose, California

February 23, 2015
Project 8415180020

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The findings, recommendations, specifications, or professional opinions are presented within the limits described by the client, in accordance with generally accepted professional engineering and geologic practice. No warranty is expressed or implied.

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1.0 EXECUTIVE SUMMARY

PROPERTY NAME: Great Oaks Boulevard Parcels
LOCATION: San Jose, California

This executive summary is provided for convenience and should not substitute for review of the complete report, including all attachments.

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) conducted a Phase I Environmental Site Assessment (ESA) at the property located at the intersection of Great Oaks Boulevard and Santa Theresa Boulevard in San Jose, California (the Site). The Phase I was conducted in material compliance with the scope and limitations of American Society for Testing and Materials (ASTM) E 1527-13. Any exceptions to, or deletions from, this practice are described in Section 2.3 of this report.

Based on the data collected during the assessment, our findings and conclusions are summarized as follows:

1.1 ON-SITE

The 33.8-acre Site is currently a vacant lot with no structures present onsite. Several utility boxes (City owned) and monitoring wells related to the offsite environmental investigation associated with the Fairchild facility are the only improvements on the Site.

The Site was not identified on lists reviewed by Environmental Data Resources (EDR).

Based on historical topographic maps, the Site appears as undeveloped land as early as the early 1900's and appears as orchards in a 1939 aerial photograph, which is the earliest readily available aerial photograph. It cannot be determined if the Site was agricultural prior 1939. With the exception of several farm structures, the Site use is agricultural through the present day. The farm related structures were removed from the Site sometime between 1998 and 2005.

No recognized environmental conditions (RECs) were identified in connection with the Site.

1.2 OFF-SITE

Surrounding land use is light industrial with residential areas to the southwest of the property. Directly to the northeast, the property is bound by Via Del Oro (Boulevard); four light industrial office buildings and a vacant lot are present beyond Via Del Oro. Directly north of the Site (across the intersection of Via Del Oro and San Ignacio Avenue) are the San Jose offices for Northrop Grumman. Three office buildings occupied by Semiconductor Tooling Services (STS), Semifab, Inc., Seminet Automation, Inc., Battle Precision Manufacturing, Inc., Keller Williams Realty, and United Administrative Services are located to the southeast of the Site across Great Oaks Boulevard. Single-family residences are present across Santa Teresa Boulevard southwest of the Site. Properties to the northwest of the Site consist of light industrial and business offices and include Exact Bid, EnGeo, AmTech Micorelectronics, and Modutek Corporation.

The surrounding properties were undeveloped from at least 1939 until approximately 1974 when residential development began south-southwest of the Site. Industrial development of the surrounding area began in approximately 1982.

The former Fairchild Site (also listed as Shell Service Station in the EDR) present at 101 Bernal Road is located approximately 0.22 miles east-southeast and hydraulically downgradient from the Site and is suspected of previously impacting groundwater below the Site. However, based on the latest groundwater monitoring data and a Phase II investigation conducted at the Site in 2006, this release is no longer considered an environmental concern for the Site. By definition, the former Fairchild facility is considered a controlled REC.

Dastek is located at 6580 Via Del Oro Boulevard immediately north-northeast and cross- to downgradient of the Site. According to Geotracker records (geotracker.waterboards.ca.gov), there are no records of sources (i.e. underground storage tanks [USTs]) or releases for the property and the case was closed (May 3, 1989) the same day it was "discovered." It is Amec Foster Wheeler's opinion that the case originally assigned to Dastek was associated with the Fairchild case. Based on the regulatory status of the Dastek property it is not expected to result in a REC that would affect the subject Site.

AT&T Mobility is located at 6578 Santa Theresa Boulevard and is immediately south-southwest and upgradient of the Site. According to Geotracker records, the responsible party for this property was the Oak Grove School District and the source of the release was a leaking diesel UST that was identified in August 1987. The UST was subsequently removed, the impacted soil excavated, and case closure was granted on June 13, 1996. Based on the regulatory status of this property, it is not expected to result in a REC that would affect the Site.

Pacific Gas and Electric Company (PG&E) located at 6402 Santa Theresa Boulevard is immediately west and upgradient of the Site. According to Geotracker records, the source of the release was leaking USTs that were identified in December 1990 during UST removal at the property. The impacted soil was excavated and the San Francisco Bay Regional Water Quality Control Board (Water Board) determined there was not a threat to groundwater from the past release and case closure was granted on January 17, 1992. Based on the regulatory status of this property, it is not expected to result in a REC that would affect the Site.

1.3 CONCLUSIONS

Based on the information made available to Amec Foster Wheeler or obtained during the assessment of the subject property, Amec Foster Wheeler offers the following conclusions:

- The former Fairchild Site is suspected of having previously impacting groundwater below the subject Site. However, based on the latest groundwater monitoring data and a Phase II investigation conducted at the subject Site in 2006, this release is no longer considered an environmental concern for the Site and no further assessment is warranted.

2.0 INTRODUCTION

On behalf of EQUINIX, Amec Foster Wheeler has completed a Phase I ESA for the property consisting of Assessor Parcel Numbers (APNs) 706-0-053, 706-0-054, 706-0-055, and 706-0-056 located at the intersection of Great Oaks Boulevard and Santa Theresa Boulevard in San Jose, California.

The purpose of the Phase I ESA was to identify environmental concerns, RECs, and business environmental risks in connection with the parcels, based on readily available information and Site observations.

This assessment was performed substantially as outlined in our proposal numbered 15PROPINDC.0000 dated January 8. 2015. Written authorization was received from Mr. Stuart Thompson of EQUINIX on January 13, 2015.

2.1 BACKGROUND

The Phase I ESA performed at the Site is intended to provide EQUINIX with information regarding the environmental liabilities of the Site prior to the completion of the potential acquisition of the property.

2.2 PROCEDURES

The Phase I ESA was performed using the ASTM Practice E 1527-13. This practice was developed to address “all appropriate inquiry” as defined by the U.S. Environmental Protection Agency (EPA). Any exceptions to, or deletions from, this practice are described in Section 2.3 of this report.

The following services were provided for the assessment:

- A qualitative hydrogeologic evaluation of the Site and vicinity using both published topographic and geologic maps and area observations to characterize the area drainage.

- A review of the history of the Site using readily available standard historical sources and an interview with an owner's representative.
- A review of available environmental reports published by state and federal agencies to determine if the Site or properties within specified search distances are listed as having a present or past environmental problem, are under investigation or are regulated by state or federal environmental regulatory agencies.
- A Site and adjacent property reconnaissance to look for surficial indications of activities involving hazardous substances and petroleum products.
- Preparation of this report presenting our findings and conclusions.

This Phase I ESA did not include ASTM non-scope items such as sampling or evaluating buildings for lead-based paint, radon, asbestos-containing materials or ambient air quality, identifying ecological conditions, compliance issues, health and safety issues or testing of the soil, air, surface water, drinking water, or groundwater for chemical contaminants.

2.3 QUALIFICATIONS

2.3.1 Limitations

The findings and opinions presented in this Phase I ESA are relative to the dates of our Site work and should not be relied on to represent conditions at substantially later dates.

The opinions included herein are based on information obtained during the study and our experience. If additional information becomes available which might impact our environmental conclusions, we request the opportunity to review the information, reassess the potential concerns, and modify our opinions, if warranted. If this assessment included a review of documents prepared by others it must be recognized that Amec Foster Wheeler has no responsibility for the accuracy of information contained therein.

Although we have to identify the potential for environmental impacts to the subject property, potential sources of contamination may have escaped detection due to: (1) the limited scope of this assessment, (2) the inaccuracy of public records, (3) the presence of undetected or unreported environmental incidents, (4) inaccessible areas, and/or (5) deliberate concealment of detrimental information. It was not the purpose of this study to determine the actual presence, degree or extent of contamination, if any, at the Site. This would require additional exploratory work, including sampling and laboratory analysis**.**

2.3.2 Definitions

ASTM E 1527-13 defines a "recognized environmental condition" (REC) as: the presence or likely presence of any hazardous substances or petroleum products in, on, or at a site: (1) due to any release to the environment, (2) under conditions indicative of a release to the environment, or (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not RECs. A *de minimis* condition generally does not present a threat to human health or the environment and generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

Separate and distinct from a REC are two other types of conditions that may be noted in a Phase I ESA: a controlled REC (CREC) or an historical REC (HREC).

A CREC is a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the current satisfaction of the applicable regulatory authority (for example, as evidenced by a no further action [NFA] letter or the equivalent, or meeting risk-based criteria established by the regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls, such as site use restrictions, activity and use limitations (AULs), institutional controls, or engineering controls.

An HREC is a REC from a past release of hazardous substances or petroleum products that has occurred in connection with the Site and has been addressed to the satisfaction of the applicable regulatory authority (using current criteria) or meets the unrestricted residential use criteria established by the regulatory authority and applicable at the time of this Phase I ESA without subjecting the Site to any required controls.

2.3.3 User Reliance

This report is intended for the use of EQUINIX only, subject to the contractual terms agreed to for this project. Reliance on this document by any other party is prohibited without the express consent of EQUINIX and that party's execution of mutually agreeable terms and conditions with Amec Foster Wheeler. Use of this report for purposes beyond those reasonably intended by EQUINIX and Amec Foster Wheeler will be at the sole risk of the user.

2.3.4 Significant Assumptions

Amec Foster Wheeler made no significant assumptions during the Site “walk-over.”

2.3.5 Exception s/Data Gaps

One data gap (interview of current Site owner) was identified, but the data gap did not affect Amec Foster Wheeler’s ability to identify RECs for the Site.

2.3.6 Deviations/Deletions

No deviations or deletions were encountered.

2.4 PREVIOUS ENVIRONMENTAL DOCUMENTS

Amec Foster Wheeler reviewed two previous environmental documents in relation to environmental conditions at the Site which were provided by EQUINIX:

Phase 1 Environmental Site Assessment Report for 300 Great Oaks Boulevard, San Jose California prepared by PIERS Environmental Services Inc. (PIERS) dated September 2006

In September 2006, on behalf of Xilinx, PIERS performed a Phase I ESA for the Site. At the time of the Phase I ESA, the Site was unimproved and used for agriculture (hay production). Four shallow wells, one recovery well, and three monitoring wells were the only improvements noted for the Site. These wells were reportedly associated with the groundwater cleanup at the Fairchild facility located approximately 1,500 feet west of the Site. Reports reviewed as part of the PIERS Phase I ESA indicated the groundwater below the Site had been impacted; however, the latest groundwater results indicated that the indicator chemicals 1,1,1-trichoroethane (TCA) and dichloroethene (DCE) had not been detected in onsite groundwater since at least 2001 and that past remedial activities at the Fairchild Facility have reduced concentrations of chemicals of concern to non-detectable levels.

Phase II Sampling Investigation Report, 300 Great Oaks Boulevard, San Jose California prepared by E2C Inc. (E2C) dated December 2006

In November 2006, on behalf of Xilinx, E2C performed an investigation consisting of eight shallow soil borings and three deeper borings to allow collection of grab groundwater samples. Soil samples from the eight shallow borings were analyzed for pesticides while soil and groundwater samples from the deeper borings were analyzed for volatile organic compounds (VOCs). Results of the shallow soil samples contained 4,4-dichlorodiphenyldichloroethylene (4,4-DDE) just above the laboratory reporting limit in six of eight samples at concentrations between 0.089 and 0.14 milligrams per kilogram (mg/kg), which is below the environmental screening level of 4.0 mg/kg for 4,4-DDE. No VOCs were detected in the soil samples. TCA (1.7 micrograms per liter; µg/L) and toluene (0.63 µg/L) were detected in groundwater samples at concentrations below their respective Environmental Screening Levels of 62 and 40 µg/L, respectively.

Based on the results of the soil and groundwater sampling, no further sampling was recommended at the Site.

3.0 SITE SETTING

Understanding of a Site's physical setting is important to the recognition of environmental impacts to the property.

3.1 GENERAL DESCRIPTION

The Site is currently undeveloped. The Site is located in a mixed commercial and light industrial area with some residential areas to the south of the Site.

The Site is located in area with relatively flat topography.

3.2 HYDROGEOLOGY

A consideration of surface and subsurface drainage and geology are of interest because they provide an indication of the direction that contaminants, if present, could be transported. The term "upgradient" refers to a location hydraulically upstream of the Site.

Amec Foster Wheeler reviewed the following information in regard to the geology and hydrogeology of the Site and surrounding area:

- *USGS Topographic Map, Santa Theresa Hills Quadrangle,* dated 1968
- Department of Water Resources (DWR), 1967. *Evaluation of Groundwater Resources: South Bay, Volume 1: Geologic and Hydrologic Data. Bulletin No. 118.1*. August.
- *EDR Radius Map Report with Geocheck®, Xilinx Site, San Jose, CA, Inquiry Number: 4183068.2s* dated January 15, 2015

3.2.1 Geologic Setting

Based on review of the geologic data, the Site is in the central portion of the Santa Teresa Groundwater Basin, an alluvium-filled bedrock basin bounded to the northeast, northwest, and southwest by bedrock hills (Diablo Range, Edenvale Ridge, and Santa Teresa Hills). It is bounded to the southeast by the Coyote Narrows, to the northwest by Edenvale Gap, and to the west by the Guadalupe River. Sediments in the Basin consist of Quaternary alluvial units, underlain by bedrock. The alluvial units thin toward the hills. The alluvium consists of deposits of more permeable sand and gravel zones separated by less permeable deposits of clay.

The Site has a topographic elevation of approximately 200 feet above mean sea level (MSL).

3.2.2 Groundwater

The direction and movement of groundwater through soil is dependent on soil type and the presence of relict structures and textures of the underlying rock. Fractures, faults, folds and foliation planes affect the migration of groundwater in rock. It is reasonable to assume that the direction of near-surface groundwater flow under static conditions (no pumping interference) approximates the surface topography of the Site.

Groundwater recharge into the Basin occurs mainly through underflow at Coyote Narrows, and at the Santa Clara Valley Water District (SCVWD) recharge ponds along Coyote Creek. Groundwater exits the Santa Teresa Basin through Edenvale Gap into the San Jose Plain. Groundwater is expected to flow to the east and was encountered at depths of approximately 40 feet below ground surface during the 2006 E2C investigation at the Site.

3.2.3 Wetlands

We evaluated Site conditions for the presence of wetland areas the National Wetlands Inventory (NWI) Map. Wetlands are defined as areas that are sufficiently saturated by surface or groundwater to support a prevalence of vegetation adapted for saturated soil conditions. As such, there are three parameters which are used in determining whether an area is a wetland:

- evidence of wetland hydrology (inundation or saturation of the ground)
- prevalence of hydrophytic (water-loving) vegetation which is capable of living in soils lacking oxygen for at least part of the growing season
- presence of hydric (water-logged) soils

Soils at the Site consist of the Botella silt clay loam, a well-drained soil with moderately course textures and slow infiltration rates.

Based on a review of the NWI Map and observations, wetlands are not located at the Site.

4.0 USER/ OWNER PROVIDED INFORMATION

The following information is based on the Environmental Questionnaire appended to this report.

4.1 Title Records

EDR provided Amec Foster Wheeler with a legal description of the Site which is included in Appendix D as part of the Environmental Lien Search Report. The property was owned by Synopsys Inc. until February 2007 when it was transferred to Xilinx Inc. Xilinx Inc. is listed as the current property owner on the lien search report.

4.2 Environmental Liens

An environmental lien search was performed by EDR for this assessment. No environmental liens or AULs were identified for the Site (Appendix D). Amec Foster Wheeler's Site contact, Mr. Stuart Thompson, Director, Real Estate – Americas for EQUINIX did not have knowledge of environmental liens held against the property.

4.3 Specialized Knowledge

Mr. Thompson indicated he did not have knowledge of past or present environmental concerns at the Site other than what was presented in the previous ESA and Phase II investigative report prepared for the Site.

4.4 Commonly Known Information

Amec Foster Wheeler did not discover commonly known information related to environmental issues with respect to the Site.

4.5 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES

Amec Foster Wheeler is not aware of and the Environmental Questionnaire did not indicate knowledge of a reduction in value of the Site due to past or present environmental issues.

4.6 OWNER/PROPERTY MANAGER OCCUPANT INFORMATION

The Environmental Questionnaire did not provide knowledge of past environmental concerns at the Site.

4.7 REASON FOR PERFORMING THE PHASE I

The Phase I ESA performed at the Site is intended to provide the buyer with information regarding the environmental liabilities of the Site prior to the potential acquisition of the Site.

5.0 REGULATORY INFORMATION

On January 22, 2015, Amec Foster Wheeler contacted the Water Board regarding the former Fairchild facility which was the suspected source of impacted groundwater that was previously identified at the Site. Mr. Max Shahbazian, Water Board staff for the Fairchild case, indicated that groundwater monitoring (semiannual) is still taking place; however, all groundwater pump and treat operations were terminated in the late 1990's due to the effectiveness of the slurry wall containment at the former facility. VOC concentrations in soil and groundwater have decreased. No other local sources were consulted based on Amec Foster Wheeler's opinion regarding their usefulness and/or accessibility.

Amec Foster Wheeler reviewed regulatory search information prepared by EDR as contained in Appendix D. The regulatory records search is based on information published by State and Federal regulatory agencies and is used to evaluate if the Site or nearby properties are listed as having a past or present record of actual or potential environmental impact. Please note that regulatory listings include only those sites which are known to the regulatory agencies at the time of publication to be (1) contaminated, (2) in the process of evaluation for potential contamination, or (3) regulated.

5.1 EPA NATIONAL PRIORITIES LIST (NPL)

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) established the National Priorities List (NPL) of federal "superfund" sites. These are the contaminated sites that have been assigned a high ranking, in terms of potential public health effects, by the EPA.

- The Site did not appear on the NPL.
- One facility was identified on the NPL within a one-mile radius of the Site.

The former Fairchild Site (also listed as Shell Service Station) at 101 Bernal Road is located approximately 0.22 miles east-southeast and hydraulically downgradient from the Site. This facility was discussed above in Section 2.4, and it is suspected that groundwater below the Site had been impacted from the release from this facility. By definition, the former Fairchild facility is considered a controlled REC.

5.2 EPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List

The CERCLIS list identifies documented and suspected contamination sites throughout the nation which were not ranked high enough to be listed on the NPL.

- The Site did not appear on CERCLIS list.
- One facility was identified on the NPL within a one-mile radius of the Site.

The former Fairchild Site was discussed above in Section 5.2, is on the CERCLIS list and was considered to be a controlled REC.

5.3 Federal CERCLIS NFRAP

No Further Remedial Action Planned (NFRAP) is the EPA database of former CERCLIS sites where “no further remedial action is planned” under CERCLA.

- The Site did not appear on the NFRAP list.
- One facility was identified on the NFRAP list within one-half mile radius of the Site.

Magex Corporation at 6850 Santa Theresa Boulevard is located east-southeast and hydraulically downgradient from the Site. This facility was identified as a potential concern in May 1986 and a preliminary assessment was completed in November 1987. Based on the assessment the case was archived. No information was available indicating why the Magex Corporation property was identified as a potential concern. Based on the NFRAP status, this facility is unlikely to result in a REC for the Site.

5.4 Resource Conservation & Recovery Information System (RCRIS)

RCRIS is the EPA database of facilities that generate, transport, store, or dispose of hazardous wastes. Generators are found on the Notifiers list. Treatment, Storage and Disposal (TSD) facilities are found on the TSD list.

- The Site did not appear on the RCRIS list.
- Five adjacent facilities were identified on the RCRIS small quantity generators list.
- One facility was identified on the RCRIS TSD list within a one-half mile radius of the Site.

None of the five RCRA-small quantity generators properties have had violations and none appear on lists indicating a release has occurred. Based on the regulatory status of these properties, none are expected to result in a REC that would affect the Site.

The former Fairchild Site was on the RCRIS TSD list and was discussed above in Section 5.2 and is considered to be a controlled REC.

5.5 EMERGENCY RESPONSE NOTIFICATION (ERNS) SYSTEM LIST

The ERNS list is a list of hazardous material spills reported to various State agencies.

The Site did not appear on the ERNS list.

5.6 FEDERAL ENGINEERING/INSTITUTIONAL CONTROLS REGISTRIES

EPA maintains lists of sites with engineering or institutional controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to eliminated pathways for regulated substances to enter environmental media or adversely affect human health. Institutional controls include administrative measures, such as groundwater and land use restrictions intended to prevent exposure to contaminants on a site.

- The Site did not appear on the engineering or institutional controls registries.
- One facility was identified on the engineering or institutional controls registries within one-half mile of the Site.

The former Fairchild Site was discussed above in Section 5.2 and is considered to be a controlled REC.

5.7 STATE INSTITUTIONAL CONTROLS LIST

The State Institutional Controls list documents sites on Public Records Listings that have institutional controls or use limitations in place.

- The Site did not appear on the state institutional controls list.
- One facility was identified on the state institutional controls list within one-half mile of the Site.

The former Fairchild Site was discussed above in Section 5.2 and is considered to be a controlled REC.

5.8 LANDFILL LIST

Lists of active and inactive landfills, artificial fills, and disposal sites are maintained by the California Integrated Waste Board. The landfill listing does not include unpermitted landfills or dumps.

- The Site did not appear on the landfill list.

- No properties were identified on the landfill list within a one-half mile radius of the Site.

5.9 Leaking Underground Storage Tank (LUST) List

The Leaking Underground Storage Tank list documents UST systems within the State of California which have reported releases of UST contents. This list is maintained by the Water Board.

- The Site did not appear on the LUST list.
- Seven facilities were identified on the LUST list within a one-half mile radius of the Site.

Dastek, located at 6580 Via Del Oro Boulevard is immediately north-northeast and cross- to downgradient of the Site. According to Geotracker records (geotracker.waterboards.ca.gov), there are no records of sources (i.e. USTs) or releases for the property and the case was closed (May 3, 1989) the same day it was “discovered.” It is Amec Foster Wheeler’s opinion that the case originally assigned to Dastek was associated with the Fairchild case and based on the regulatory status of this property it is not expected to result in a REC that would affect the subject Site.

AT&T Mobility is located at 6578 Santa Theresa Boulevard and is immediately south-southwest and upgradient of the Site. According to Geotracker records, the case responsible party was the Oak Grove School District and the source of the release was a leaking diesel UST that was identified in August 1987. The UST was subsequently removed, the impacted soil excavated and case closure granted on June 13, 1996. Based on the regulatory status of this property, it is not expected to result in a REC that would affect the Site.

PG&E (listed twice), located at 6402 Santa Theresa Boulevard, is immediately west and upgradient of the Site. According to Geotracker records, the source of the release was leaking USTs that were identified in December 1990 during UST removal at the property. The impacted soil excavated and the Water Board determined there was not a threat to groundwater from the past release and case closure was granted on January 17, 1992. Based on the regulatory status of this property, it is not expected to result in a REC that would affect the Site.

The remaining three facilities identified on the LUST database are not located adjacent to the Site and are situated hydraulically downgradient from the Site and will not likely results in a REC to the Site.

5.10 Registered Storage Tank List

The Registered Storage Tank List is a listing of UST systems which are registered with the State of California Water Resources Control Board.

- The Site did not appear on the Registered Storage Tank list.
- Three adjoining facility were identified on the Registered Storage Tank list.

Oak Grove School District and PG&E (listed twice), were discussed above in the LUST section (Section 5.9) and have received closure and are not expected to result in a REC that would affect the Site.

5.11 STATE DRYCLEANERS

A list of drycleaners in California is maintained by the Department of Toxic Substances Control.

- No dry cleaning facilities were identified on or adjacent to the Site.

5.12 HISTORICAL GAS STATIONS AND DRYCLEANERS

Historical auto stations and drycleaners are facilities identified by EDR from categorically searching selected national collections of business directories. Facilities are identified based on categories which might suggest, however not exclusively identify, gas/filling/service stations or dry cleaning establishments.

- No historical auto stations were identified on or adjacent to the Site.
- No historical drycleaners were identified on or adjacent to the Site.

5.13 TRIBAL LISTINGS

The Site is not located within a Native American Tribal Jurisdiction.

5.14 OTHER LISTED FACILITIES

Orphan sites are those sites which are not mapped by EDR due to poor or inadequate address information. No orphan sites were identified during the list search.

Multiple other non-ASTM regulatory lists summarized in Appendix C were reviewed. None of the properties identified on those lists were determined to have a potential to impact the Site. For more information regarding these sites and orphan facilities see the EDR Regulatory Search Information in Appendix D.

6.0 HISTORICAL RECORDS REVIEW

Amec Foster Wheeler reviewed reasonably ascertainable, standard historical sources to develop a history of the previous uses of the Site and surrounding area in order to help identify the likelihood of past uses that could have led to RECs in connection with the Site. Amec Foster Wheeler has attempted to identify the past uses of the Site at intervals defined by ASTM from the present back to the Site's first developed use or 1940, whichever is earlier. Information was obtained dating back to 1919.

Based on historical topographic maps, the Site was undeveloped land as early as the early 1900's and appears as orchards in a 1939 aerial photograph, which is the earliest readily available aerial photograph. It cannot be determined if the Site was agricultural prior 1939. With the exception of several farm structures, the Site use is agricultural through the present day. The farm related structures were removed from the Site sometime between 1998 and 2005.

According to information provided by EDR, the Site was owned by Synopsys Inc. until February 2007 when it was transferred to Xilinx Inc. Xilinx Inc. is listed as the current property owner on the lien search report.

6.1 TITLE RECORDS

EQUINIX did not provide Amec Foster Wheeler with the results of a reasonably ascertainable recorded land title records search for the Site that could be reviewed to identify environmental liens and AULs, if any, that are currently recorded against the Site. However, the environmental lien report provided by EDR did not identify environmental liens or activity use limitations for the Site.

6.2 LOCAL STREET DIRECTORY

EDR completed a local street directory search for 300 Great Oaks Boulevard as a screening tool to assist in evaluating potential liability resulting from past activities on or near the Site. The Site is not listed in the EDR local street directory during the span of the directory. EDR also completed a local street director search for surrounding properties on San Ignacio Avenue, Via Del Oro Boulevard, Santa Teresa Boulevard, and Great Oaks Boulevard.

The local street directory report is summarized below and is included in Appendix D.

Table 1: Street Directory Search Results

Date	Property	Adjoining Properties
2008 and 2006	Not Listed	Oak Grove School District, Microelectronic, Communications XCI
2000	Not Listed	Oak Grove School District, Candescent Technologies
1991	Not Listed	Oak Grove School District, Dastek Corporation, Corvus Systems, Zentec Corporation, Exsil, South Valley Christian Church
1985	Not Listed	Oak Grove School District, Advanced Storage Technology, Cybernex Corporation, Actrix Computer Corporation
1975	Not Listed	Oak Grove School District

Street directory listings for surrounding properties includes a school district office and commercial and light industrial properties. Amec Foster Wheeler's review of the local street directory records did not identify historical usage that would be considered a REC in connection with the Site.

6.3 AERIAL PHOTOGRAPHS

Aerial photographs are photographs taken from an aerial platform with sufficient resolution to allow identification of development and activities of areas encompassing the Site. Amec Foster Wheeler reviewed available aerial photographs of the Site and surrounding area dated 1939, 1948, 1950, 1956, 1968, 1974, 1982, 1993, 1998, 2005, 2006, 2009, 2010, and 2012. The table below summarizes the information obtained from review of the aerial photographs. It should be noted that Site features may not be discernible on the aerial photographs due to the scale or degree of clarity of a given photograph. Copies of the aerial photographs are included in Appendix D.

Table 2: Aerial Photograph Search Results

Date	Scale	Property	Adjoining Properties
1939	1:500	The Site appears to be part of a larger orchard. Up to five structures which appear to be a farm house and sheds also appear to be present onsite. No parcel boundaries are evident.	The surrounding area is orchard and agricultural fields.
1948	1:500	Same as 1939.	Same as 1939.
1950	1:500	Same as 1939.	Same as 1939.
1956	1:500	Same as 1939.	Same as 1939.
1968	1:500	Additional sheds appear to be present on the properly, otherwise no changes are evident.	Some grading on properties to the south-southwest is taking place, otherwise no changes are evident.
1974	1:500	Same as 1968.	Significant residential development has taken place south-southwest of the Site and Santa Teresa Boulevard has been constructed.
1982	1:500	The Site boundaries are now present and the Site is bounded by San Ignacio Avenue, Via Del Oro Boulevard, Santa Teresa Boulevard, and Great Oaks Boulevard. Orchards are present on the north, east, and west portions of the Site; however, the southern portions of the Site have been graded.	The properties to the north, east, and west have multiple large light industrial/commercial structures and associated parking lots present. Grassy fields remain immediately north of the Site.
1993	1:500	Same as 1982.	Additional commercial park development has taken place immediately north, east, and west of the Site.

Date	Scale	Property	Adjoining Properties
1998	1:500	The majority of the Site contains a fallow field except for the northeast corner which has multiple sheds present.	Same as 1993 except for additional commercial park development in the surrounding area.
2005	1:500	The sheds are absent and the Site is a tilled field.	Same as 1998 except for additional commercial park development in the surrounding area.
2006	1:500	Same as 2006.	Same as 2005.
2009	1:500	Same as 2006.	Same as 2005.
2010	1:500	Same as 1982.	Same as 2005.
2012	1:500	Same as 1982.	Same as 2005.

Amec Foster Wheeler's review of the aerial photographs did not identify historical usage that is considered to be a REC in connection with the Site.

6.4 HISTORICAL TOPOGRAPHIC MAPS

Historical topographic maps of the Site and surrounding area were reviewed for the years 1919, 1947, 1953, 1968, and 1980. The table below summarizes the information obtained from review of the topographic maps. Copies of the topographic maps are included in Appendix D.

Table 3: Historical Topographic Map Search Results

Date	Scale	Property	Adjoining Properties
1919 (2 maps)	1:62500	Undeveloped. Due to the scale of the map specific features are not discernible.	Undeveloped. Due to the scale of the map specific features are not discernible.
1947	1:50000	Same as 1919.	Same as 1919.
1953	1:24000	The Site is depicted as agricultural. Two small structures appear to be within the Site boundary.	The surrounding area is depicted as agricultural. Interspersed structures are depicted.
1968	1:24000	Same as 1953.	Same as 1953.
1980	1:24000	Same as 1947.	With the exception of a residential development south- southwest of the Site, the same as 1953.

Amec Foster Wheeler's review of the historical topographic maps did not identify historical usage that is considered to be a REC in connection with the Site.

6.5 FIRE INSURANCE MAPS

On January 15, 2015, Amec Foster Wheeler requested EDR to search for available Sanborn fire insurance maps. A reply was received on the same day, stating that Sanborn fire insurance map coverage is not available for this area. A copy of the EDR response is included in Appendix D.

6.6 BUILDING DEPARTMENT RECORDS

On January 15, 2015, Amec Foster Wheeler requested EDR to search for available building permits at the Site and surrounding areas. A Building Permit Report was received on January 15, 2015 that indicated no permits were issued for the Site property. A copy of the EDR report is included in Appendix D.

7.0 SITE INFORMATION AND USE

Amec Foster Wheeler performed a Site and vicinity reconnaissance, conducted interviews and reviewed available historical information to evaluate the current and historical uses of the Site and surrounding properties and to evaluate past or present activities of potential environmental concern. Mr. Scott Graham, an environmental professional with Amec Foster Wheeler experienced in conducting ESAs, conducted a Site and area visit on January 20, 2015. The Site reconnaissance was performed on foot and the area reconnaissance was a driving tour on public access roads.

7.1 CURRENT SITE USE

The 33.8-acre site is currently a vacant lot with no structures present onsite. Several utility boxes (City owned) and monitoring wells related to the offsite environmental investigation associated with the former Fairchild facility are the only improvements on the Site. The Site is located in a light industrial area with residential areas to the southwest of the property. Photographs of the Site are included in Appendix B.

The following conditions were specifically assessed for their potential to result in a REC.

7.1.1 Storage Tanks

No evidence of existing USTs or above ground storage (ASTs) tanks was observed on the property.

7.1.2 Hazardous and Petroleum Containers/Drums

Amec Foster Wheeler did not observe any containers or drums on the property.

7.1.3 Unidentified Substance Containers

Amec Foster Wheeler did not observe unidentified substance containers on the property.

7.1.4 Heating/Cooling Fuels and Chemicals

No heating or cooling fuels or chemicals were observed on the Site during Amec Foster Wheeler's reconnaissance activities.

7.1.5 Solid Waste

Amec Foster Wheeler observed small amounts of construction debris and household waste dumped on the Site. Concrete debris, particle board/wooden materials, and what appeared to be a demolished microwave were noted onsite at the time of the inspection (Photographs 7 and 11).

7.1.6 Sewage Disposal/Septic Tanks

The Site is an empty lot and not currently hooked up to the City sewage system. No evidence of a septic system was observed at the Site at the time of the inspection.

7.1.7 Hydraulic Equipment

No hydraulic equipment was observed onsite during the time of the inspection.

7.1.8 Contracted Maintenance Services

It is unknown whether contracted maintenance services are employed at the Site.

7.1.9 Electrical Transformers

Electrical transformers are a potential source of environmental concern due to the potential presence of polychlorinated biphenyls (PCB) contained in dielectric fluids used in some units. Two electrical transformers, owned by PG&E, (Photographs 8 and 13) were observed in good condition at the Site.

7.1.10 Water Supply and Wells

The Site is currently vacant and no water supply wells are known to be or were observed onsite. Three groundwater monitoring/recovery wells are located onsite (Photographs 4, 5, and 14) that are related to an offsite groundwater investigation at the former Fairchild facility (Section 2.4).

7.1.11 Drains, Sumps, and Pooled Liquids

No drains, sumps, or pooled liquids were observed onsite during the time of the Site reconnaissance. Several storm drains were located on the surrounding streets, all of which were marked as draining to Canoas Creek.

7.1.12 Pits, Ponds Lagoons and Surface Waters

No pits, ponds, lagoons, or other surface waters were noted onsite during the time of the Site reconnaissance.

7.1.13 Stained/Corroded Surfaces

No stained or corroded surfaces were observed onsite during the time of the Site reconnaissance.

7.1.14 Stressed Vegetation

Amec Foster Wheeler did not observe stressed vegetation during the Site reconnaissance.

7.1.15 Odors

Amec Foster Wheeler did not observe unusual odors during the Site reconnaissance.

7.2 PAST SITE USE

Based on historical aerial photographs and notes from a previous ESA conducted for the Site in 2006 (PIERS, 2006), the Site was used as part of an orchard from at least the late 1940s until the early 1980s. Between at least the late 1990s and 2005, the Site was either fallow or used as an agricultural field.

7.3 SURROUNDING LAND USE

Nearby property usage could potentially impact the surface and subsurface conditions of a property. Developing a history of past to present uses or occupancies can provide an indication of the likelihood of environmental concern.

7.3.1 Northeast

Directly to the northeast, the Site is bound by Via Del Oro (street). On the other side of Via Del Oro, the property to the northeast is presently occupied by four light industrial office buildings, and a vacant lot. Two of the buildings northeast of the Site were vacant, and one of these two was undergoing remodeling at the time of the inspection. The other two properties were occupied by Kaiser Permanente (medical clinic) and Linotext, which is a commercial printing and lithographic company according to their website.

Directly north of the Site (across the intersection of Via Del Oro and San Ignacio Avenue) is the San Jose offices for Northrop Grumman.

7.3.2 Southeast

Across Great Oaks Boulevard, the properties to the southeast consist of three office buildings. STS, Semifab, Inc., Seminet Automation, Inc., Battle Precision Manufacturing, Inc., Keller Williams Realty, and United Administrative Services are located in the buildings to the southeast of the Site.

7.3.3 Southwest

Across Santa Teresa Boulevard, the properties to the southwest of the Site consist of single-family residences.

7.3.4 Northwest

Across San Ignacio Avenue, the properties to the northwest of the Site consist of light industrial and business offices. Businesses include Exact Bid (a software company), EnGeo, Incorporated (an environmental and geotechnical consultant company), AmTech

Micorelectronics, Inc. (a packaging and microelectronics manufacturer), and Modutek Corporation (a semiconductor equipment manufacturer).

8.0 INTERVIEWS

The following interviews were conducted with knowledgeable persons, as available.

8.1 PROPERTY OWNER

The current property owner was not available to interview.

8.2 SITE MANAGER/TENANTS

There is no Site manager or tenant.

8.3 PAST OWNER/TENANTS

Amec Foster Wheeler did not interview past tenants.

8.4 SURROUNDING PROPERTY/OWNERS/TENANTS

Amec Foster Wheeler did not interview surrounding property owners/tenants.

8.5 LOCAL GOVERNMENT OFFICIALS

On January 22, 2015, Amec Foster Wheeler contacted the San Jose Fire Department regarding spills reported at the Site. No spills were reported at the Site.

9.0 OPINION

Based on the findings of our Phase I ESA, we offer the following opinion relative to potential environmental concerns.

9.1 ON-SITE CONDITIONS

The 33.8-acre site is currently a vacant lot with no structures present onsite. Several utility boxes (City owned) and monitoring wells related to the offsite environmental investigation associated with the former Fairchild facility are the only improvements on the Site.

The Site was not identified on lists reviewed by EDR.

Based on historical topographic maps, the Site appears as undeveloped land as early as the early 1900's and appears as orchards in a 1939 aerial photograph, which is the earliest readily available aerial photograph. It cannot be determined if the Site was agricultural prior 1939. With the exception of several farm structures, the Site use was agricultural through the present day. The farm related structures were removed from the Site sometime between 1998 and 2005.

No recognized environmental conditions (RECs) were identified in connection with the Site.

9.2 OFF-SITE CONDITIONS

Surrounding land use is light industrial with residential areas to the southwest of the property. Directly to the northeast, the property is bound by Via Del Oro (Boulevard), four light industrial office buildings, and a vacant lot is present beyond Via Del Oro. Directly north of the Site (across the intersection of Via Del Oro and San Ignacio Avenue) is the San Jose offices for Northrop Grumman. Three office buildings occupied by STS, Semifab, Inc., Seminet Automation, Inc., Battle Precision Manufacturing, Inc., Keller Williams Realty, and United Administrative Services are located to the southeast of the Site across Great Oaks Boulevard. Single-family residences are present across Santa Teresa Boulevard southwest of the Site. Properties to the northwest of the Site consist of light industrial and business offices and include Exact Bid, EnGeo, AmTech Micorelectronics, and Modutek Corporation.

The surrounding properties were undeveloped from at least 1939 until approximately 1974 when residential development has taken place south-southwest of the Site. Industrial development of the surrounding area began in approximately 1982.

The former Fairchild Site (also listed as Shell Service Station) at 101 Bernal Road is located approximately 0.22 miles east-southeast and hydraulically downgradient from the subject Site and is suspected of impacting groundwater below the subject Site. However, based on the latest groundwater monitoring data and a Phase II investigation conducted at the subject Site in 2006, this release is no longer considered an environmental concern for the Site. By definition, the former Fairchild facility is considered a controlled REC.

Dastek is located across Via Del Oro Boulevard at 6580 Via Del Oro Boulevard immediately north-northeast and cross- to downgradient of the Site. According to Geotracker records, there are no records of sources (i.e. USTs) or releases for the property and the case was closed (May 3, 1989) the same day it was “discovered”. It is Amec Foster Wheeler’s opinion that the case was associated with the Fairchild case and based on the regulatory status of this property it is not expected to result in a REC that would affect the subject Site.

AT & T Mobility is located across Santa Theresa Boulevard at 6578 Santa Theresa Boulevard and immediately south-southwest and upgradient of the Site. According to Geotracker records, the case responsible party was the Oak Grove School District and the source of the release was a leaking diesel UST that was identified in August 1987. The UST was subsequently removed, the impacted soil excavated and case closure granted on June 13, 1996. Based on the regulatory status of this property, it is not expected to result in a REC that would affect the subject Site.

PG&E is located across Santa Theresa Boulevard at 6402 Santa Theresa Boulevard and immediately west and upgradient of the Site. According to Geotracker records, the source of the release was leaking USTs that were identified in December 1990 during UST removal at the property. The impacted soil was excavated and the Water Board determined there was not a threat to groundwater from the past release and case closure was granted on January 17, 1992. Based on the regulatory status of this property, it is not expected to result in a REC that would affect the Site.

10.0 CONCLUSIONS

Amec Foster Wheeler has performed a *Phase I Environmental Site Assessment* in conformance with the scope and limitations of ASTM Standard Practice E 1527-13 of property located at the intersection of Great Oaks Boulevard and Santa Theresa Boulevard in San Jose, California. Any exceptions to, or deletions from, this practice are described in Section 2.3 of this report. This assessment has revealed evidence of *recognized environmental conditions* (RECs) in connection with the property as discussed in Section 8.0. Based on the information made available to Amec Foster Wheeler or obtained during the assessment of the subject property, Amec Foster Wheeler offers the following conclusions:

- The former Fairchild Site is suspected of having previously impacted groundwater below the Site. However, based on the latest groundwater monitoring data and a Phase II investigation conducted at the Site in 2006, this release is no longer considered an environmental concern for the Site and no further assessment is warranted.

11.0 RESTRICTIONS

This report was prepared for the exclusive use of EQUINIX, and is intended to provide a Phase I ESA of APNs 706-0-053, 706-0-054, 706-0-055, and 706-0-056 located at the intersection of Great Oaks Boulevard and Santa Theresa Boulevard in San Jose, California at the time of the Site visit. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. Should additional parties require reliance on this report, written authorization from Amec Foster Wheeler will be required. With respect to third parties, Amec Foster Wheeler has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The report is based on data and information collected during the Phase I ESA of the Site conducted by Amec Foster Wheeler. It is based solely on the conditions of the Site encountered at the time of the Site visit on January 20, 2015 supplemented by a review of historical information and data obtained by Amec Foster Wheeler as described in this report and discussion with a representative of the owner/occupant, as reported herein. Except as otherwise specified, Amec Foster Wheeler disclaims any obligation to update this report for events taking place, or with respect to information that becomes available to Amec Foster Wheeler after the time during which Amec Foster Wheeler conducted the Phase I ESA.

In evaluating the Site, Amec Foster Wheeler has relied in good faith on information provided by other individuals noted in this report. Amec Foster Wheeler has assumed that the information provided is factual and accurate. In addition, the findings in this report are based, to a large degree, upon information provided by the current owner/occupant. Amec Foster Wheeler accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted.

Amec Foster Wheeler makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

This Report is also subject to the further Qualifications contained herein.

We trust that the information presented in this report meets your current requirements. If you have questions, or concerns, please contact the authors of the report.

12.0 ENVIRONMENTAL PROFESSIONAL STATEMENT

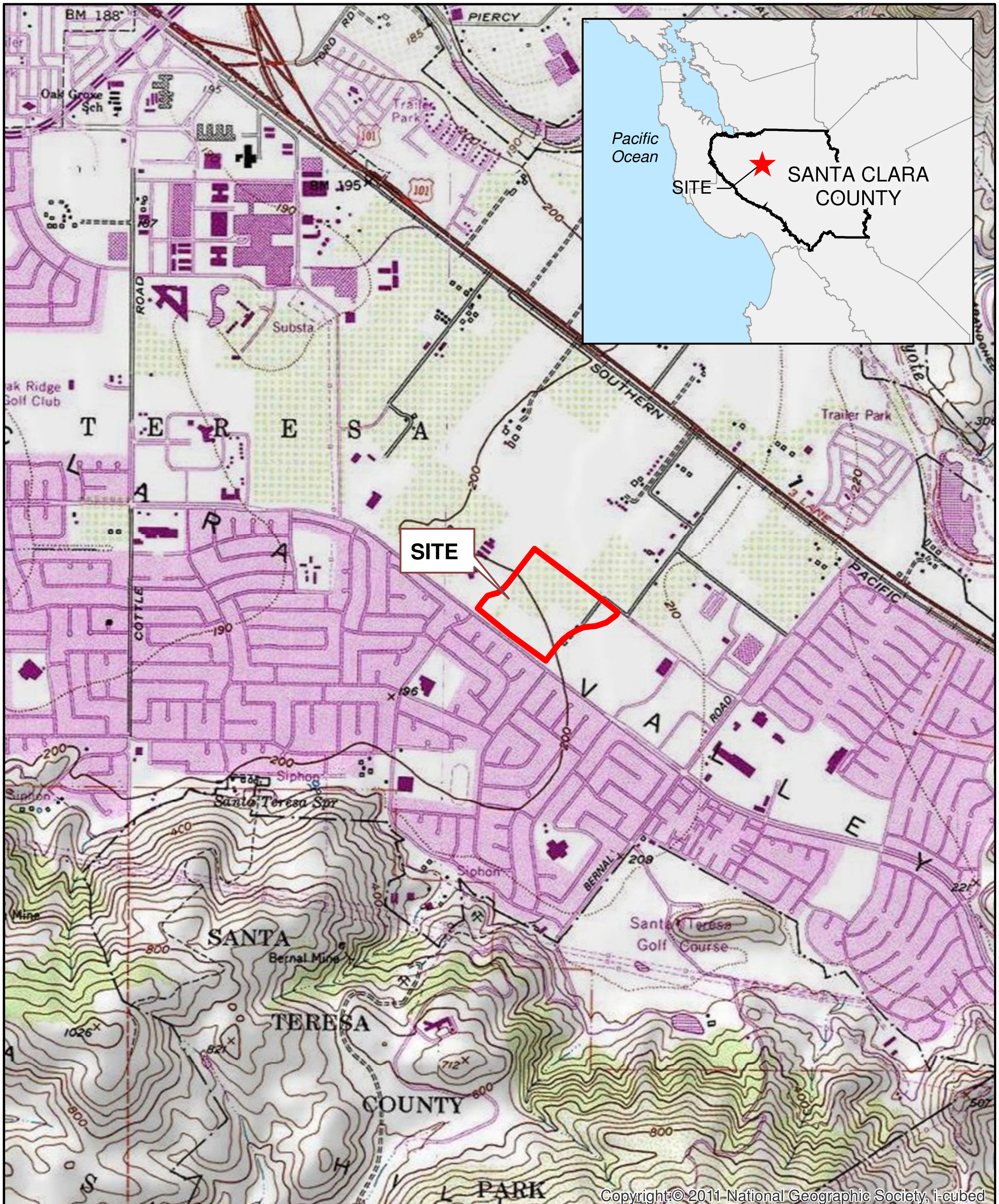
I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in § 312.10 of 40 CFR 312 and I have the specific qualifications based on education, training, and experience to assess a *property* of the nature, history, and setting of the subject property. I have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Gary A Lieberman
Associate Geology Professional

February 23, 2015
Date

APPENDIX A

Figures



Source: Santa Teresa Hills Quadrangle
(USGS 1:24,000 Sheets)

SITE LOCATION AND TOPOGRAPHIC MAP
Equinix, Inc.
Great Oaks Boulevard Parcels
San Jose, California

Date: 01/29/2015 | Project No. 8415180020

amec foster wheeler

Figure 1

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SITE AND SURROUNDING AREA MAP
Equinix, Inc.
Great Oaks Boulevard Parcels
San Jose, California

amec foster wheeler

Figure
2

Date: 01/29/2015 | Project No. 8415180020

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APPENDIX B

Photographs

APPENDIX B

PHOTOGRAPHS
Report of Phase I Environmental Site Assessment
Great Oaks Boulevard Parcels, San Jose, California

Photograph 1 Looking southeast along Santa Teresa Boulevard from the corner with San Ignacio Avenue.

Photograph 2 Looking east across the Site from the corner of Santa Teresa Boulevard and San Ignacio Avenue.

Photograph 3 Looking northeast along the western edge of the Site. San Ignacio Avenue on the left.

Photograph 4 Groundwater monitoring well WCC-13(B).

Photograph 5 Groundwater monitoring well 74(B).

Photograph 6 Looking west at residences located on the south side of Santa Teresa Boulevard.

Photograph 7 Debris located onsite.

Photograph 8 PG&E electrical transformer located near the northeast corner of the Site.

Photograph 9 Typical storm drain located on the streets surrounding the Site.

Photograph 10 Looking northwest along Via Del Oro (street on the right) from the northeast corner of the Site.

Photograph 11 Debris located onsite.

Photograph 12 Looking southwest along San Ignacio Avenue from the north corner of the Site.

Photograph 13 PG&E transformer located on the Site, along San Ignacio Avenue.

Photograph 14 Looking southwest at groundwater recovery well RW-19, located along San Ignacio Avenue (on the right).

APPENDIX C

User/Owner Questionnaire

PHASE I ENVIRONMENTAL SITE ASSESSMENT

ENVIRONMENTAL QUESTIONNAIRE

Amec Foster Wheeler

Introduction:

In order to comply with ASTM E 1527-13 and with the Standard for All Appropriate Inquires issued by the United States Environmental Protection Agency as set forth in the 40 CFR 312, the user, who is defined below, must provide the information that is requested below to the Environmental Professional. If the user fails to provide this information, a court could determine that the All Appropriate Inquiry was not complete.

User is defined as the party seeking to use ASTM E 1527-13 to complete an environmental site assessment of the property. A user may include, without limitation, a potential purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager. The user has specific obligations as outlined in Section 6 of ASTM E 1527-13. The User will normally be Amec Foster Wheeler's Client.

The User can obtain a copy of ASTM E 1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* at the ASTM web site http://www.astm.org/.

In any case where the questionnaire requests an explanation or the User believes that additional information is appropriate, please provide all relevant information on an attached sheet and identify the question to which the information pertains.

Site Information: Xilinx Land - Legal description attached.

1. **Environmental cleanup liens that are filed or recorded against the site (CFR 312.25)**
   Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law? ____yes or _X_no If yes, please explain.

2. **Activity and land use limitations that are in place on the site or that have been filed or recorded in a registry (40 CFR 312.26)**
   Are you aware of any activity and use limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law? ____yes or _X_no If yes, please explain.

3. **Specialized knowledge or experience of the person seeking to qualify for the Landowner Liability Protections (40 CFR 312.28)**
   As the user of this Phase I, do you have any specialized knowledge or experience related to the property or nearby properties? ____yes or _X_no If yes, please explain.

   Are you involved in the same line or business as the current of former occupants of the property or an adjoining so that you would have specialized knowledge of the chemicals and processes used by the type of business? ____yes or _X_no If yes, please explain.

4. **Relationship of the purchase price to the fair market value of the property if it were not contaminated (40 CFR 312.29)**
   Does the purchase price being paid for this property reasonably reflect the fair market value of the property? _X_yes or ____no

   If you answered the preceding question other than "yes", please answer the following question. If you concluded that there is a difference, have you considered whether the lower purchase price is because contamination is known of believed to be present at the property? ____yes or ____no If yes, please explain.

5. **Commonly known or reasonably ascertainable information about the property (40 CFR 312.30)**
   Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of a release or threatened release? ____yes or _X_no For example, as user:

   - Do you know the past uses of the property? ____yes or _X_no If yes, please explain.

   - Do you know of specific chemicals that are present or once were present at the property?
     ____yes or _X_no If yes, please explain.

- Do you know of spills or other chemical releases that have taken place at the property?
  ____yes or _X_no If yes, please explain.

- Do you know of any environmental cleanups that have taken place at the property?
  ____yes or _X_no If yes, please explain.

6. **The degree of obviousness of the presence of likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31)**
   As the user of this Phase I, based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property? ____yes or _X_no If yes, please explain.

2/2/15 Stuart S. Thompson

Signed/Date Printed Name

Please Circle One

Property Owner; Former Property Owner; Potential Buyer of Property; Real Estate Agent; Other (if other, please explain)

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APPENDIX D

Regulatory Search Information and Historical Information