SUNNYVALE WATER POLLUTION CONTROL PLANT MASTER PLAN – SECONDARY TREATMENT AND DEWATERING FACILITIES

Program Environmental Impact Report Addendum

Prepared for City of Sunnyvale August 2018



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CHAPTER 1 Background and Purpose of the Addendum

Background

The City of Sunnyvale (City) owns and operates the Donald M. Somers Water Pollution Control Plant (WPCP), located at 1444 Borregas Avenue in Sunnyvale, Santa Clara County (see Figure 1). The WPCP provides treatment of wastewater flows and loads from domestic, commercial, and industrial sources in Sunnvyale, Rancho Rinconada, and Moffett Field. The WPCP includes an approximately 16.6-acre main plant and two oxidation ponds¹ that occupy about 436 acres in total (see Figure 2). The WPCP was originally constructed in 1956. With the enactment of the Clean Water Act in 1972, more restrictive water quality standards were established, leading to expansion of and process upgrades to the WPCP. Currently, the WPCP processes about 12 million gallons per day (mgd) average dry weather flow.² The surrounding dry land area is primarily used for industrial and recreation purposes: the Sunnyvale Materials Recovery and Transfer Station (SMaRT Station) and the former Household Hazardous Waste Drop-off Site on Carl Road abut the main plant to the east and south, respectively; the Sunnyvale Landfill (now closed and traversed by numerous trails) borders these facilities. The Sunnyvale West Channel forms the main plant's western boundary; the Sunnyvale East Channel borders the landfill further east. Caribbean Drive runs east-west along the southern edge of the Sunnyvale Landfill. The San Francisco Bay Trail borders the WPCP to the west and north, and an existing entrance to the Bay Trail and a parking area are located at the west end of Carl Road.³

The City was the lead agency for the Sunnyvale Water Pollution Control Plant Master Plan Program Environmental Impact Report (PEIR) (State Clearinghouse No. 2015062037).⁴ The City adopted the PEIR for the WPCP Master Plan and approved implementation of the WPCP Master Plan on August 23, 2016. The PEIR evaluated potential environmental impacts that could occur as a result of implementing the Master Plan, and provided applicable mitigation to reduce the

¹ The oxidation ponds provide biological oxidation of soluble organic material and physical removal of suspended solids that remain in the wastewater after primary clarification. The ponds also play an important role in the conversion of ammonia to nitrate for 2-3 months during the summer. Their large storage capacity provides a means for equalizing the flow of wastewater to the downstream unit processes, and for storing water to allow reduced (or zero) flow rate to the downstream processes for maintenance or other purposes.

² Average dry weather flow, or ADWF, is the average of the daily average flow during the three-month period between June and September (the driest times of the year in Sunnyvale) that produces the minimum flow.

³ As part of a separate Master Plan project, the Bay Trail trailhead and parking will be relocated to Caribbean Drive.

⁴ City of Sunnyvale, Sunnyvale Water Pollution Control Plant Master Plan Program Environmental Impact Report, adopted August 23, 2016. The PEIR can be accessed online at http://www.sunnyvalecleanwater.com/programenvironmental-impact-report.

intensity of potential environmental impacts. As part of Master Plan approval, the City adopted a Mitigation Monitoring and Reporting Program.

Subsequent to adoption of the PEIR, projects included in the Master Plan have undergone further development. Chapter 2 of this document presents a description of one of these projects: the Secondary Treatment and Dewatering Facilities Project. Chapter 3 presents an evaluation of the environmental impacts of the Secondary Treatment and Dewatering Facilities Project as currently developed in comparison to the impacts disclosed in the PEIR. Chapter 4 summarizes the findings of the evaluation presented in Chapter 3. Chapter 5 contains mitigation measures from the approved Master Plan Mitigation Monitoring and Reporting Program.

Purpose of This Addendum

The CEQA Guidelines (Sections 15162 and 15164) allow that a lead agency may prepare an addendum to a previously certified EIR if some changes or additions to the environmental evaluation are necessary, but none of the following occurs:

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

This Addendum documents that the Secondary Treatment and Dewatering Facilities Project as modified subsequent to the Master Plan does not trigger any of the conditions described above.



SOURCE: Thomas Brothers; ESA





SOURCE: H.T. Harvey & Associates; adapted by ESA

Sunnyvale Secondary Treatment and Dewatering Facilities

Figure 2 Sunnyvale Water Pollution Control Plant Area Map

CHAPTER 2 Project Description

Summary of Previously Approved Project

As part of the Master Plan process the City identified the need to replace the secondary treatment process to ensure continued reliable treatment and to help meet potential regulatory limits for nutrients (nitrogen and phosphorus). The Master Plan identified a conventional activated sludge¹ (CAS) process, to be phased in over a number of years, to eventually replace all existing secondary treatment facilities (including the oxidation ponds, fixed growth reactors, and air flotation tanks; shown in **Figure 3**). The City proposed to stage replacement of secondary treatment facilities by using a "Split Flow" configuration (Stage 1) prior to full conversion to conventional activated sludge treatment (Stage 2). During the first stage, the City would build a smaller conventional activated sludge facility (than what would ultimately be needed to treat all flows through the plant) and continue to use the existing secondary treatment process to treat a portion of the flow, splitting the flow between the existing and new secondary treatment processes. These facilities as originally proposed were described on PEIR page 3-16.

Split Flow CAS Stage 1, as currently configured, is the project evaluated in this document.

Components of the Secondary Treatment and Dewatering Facilities

Following certification of the Master Plan PEIR and approval of the Master Plan, the City proceeded with design of the Secondary Treatment and Dewatering Facilities. Further refinement of these facilities, which would be constructed within the plant fenceline, are summarized below in **Table 2-1**. Support facilities have been implemented in stages in concert with implementation of Master Plan projects; as a result, this project includes the second stages of the electrical and supervisory control and data acquisition (SCADA) systems. **Figure 4** illustrates the project site boundaries and the main plant fenceline. Proposed facilities are shown on **Figures 5** and **6**. The capacity of the new facilities is consistent with the capacity described in the PEIR.

¹ Activated sludge treatment makes use of applied microbiology (using beneficial bacteria and protozoa) to degrade organic materials and remove nutrients from wastewater to produce a high-quality effluent. Blowers and pump stations are used to maintain mixed, aerobic conditions and to route flows where needed. At the end of the process, clarifiers are used to settle out the activated sludge microbes. Most settled sludge is recycled to sustain the process. Excess sludge is "wasted" and then anaerobically digested to produce methane-rich biogas and a biosolids product. The activated sludge process has been in use world-wide for over 100 years.

Project component	Master Plan Facilities Evaluated in PEIR	Proposed Facilities
Split Flow Conventional Activated Sludge Stage 1	Two aeration basins	 Same, with sidestream ammonia treatment and similar footprint
	Blower building and aeration blowers	• Same
	Three secondary clarifiers located on west side of main plant site	 Four smaller secondary clarifiers on the east side of main plant site
	 Two combined return activated sludge/waste activated sludge pump stations 	 One return activated sludge pump station and one waste activated sludge pump station
	Primary effluent distribution structure	Same
Maintenance Building	One 8,200 square foot building	Same
Thickening and Dewatering Facility	 Thickening and Dewatering Building and equipment, maximum height of 50 feet above grade 	Same, maximum height of 55 feet above grade
	Digested sludge storage tank	Same, with piping upgrades
	 Cake storage and truck loading facility (Cake Loading) 	• Same
	 Odor control system (with bioscrubber) 	• Same
	Polymer storage and feed systems	• Same
12 kilovolt (kV) Electrical Distribution System (Stage 2)	Stage 2 to be implemented with secondary treatment improvements	Same
Digester Supernatant Pump Station and Drainage Piping	Repairs to these facilities were previously planned as a separate project in PEIR	Structural, piping, and related repairs to pump station and drainage piping
Flood Protection	Wall built to elevation 13 feet NAVD88	Wall built to elevation 14 feet NAVD88
Standby Generator and Fuel Tank	Diesel powered (2.5 megawatt [MW])	Diesel powered (2 MW)

 Table 2-1

 SUMMARY OF SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT



ESA

SOURCE: ESA; Base Map Google Earth



Sunnyvale Secondary Treatment and Dewatering Facilities Figure 4 Project Area

SOURCE: ESA, 2018; Base Map - Google Earth

ESA





SOURCE: Carollo, 2018

Sunnyvale Secondary Treatment and Dewatering Facilities

Figure 5 Proposed Secondary Treatment and Dewatering Project

2. Project Description

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Sunnyvale Secondary Treatment and Dewatering Facilities Figure 6 Proposed Floodwall

SOURCE: ESA; Base Map Google Earth

Split Flow Conventional Activated Sludge Stage 1

Flow would be split between the existing secondary treatment process at the WPCP (oxidation ponds, fixed growth reactors, and air flotation tanks) and the conventional activated sludge (CAS) system proposed in this project. These facilities would include the following components:

- Aeration basins
- Sidestream nitrogen removal facilities
- Aeration blower building and blowers
- Secondary clarifiers
- Return activated sludge and waste activated sludge pumping
- Mixed liquor splitter structure and primary effluent distribution structure

As summarized in Table 2-1, the current project includes four smaller secondary clarifiers instead of three compared with the PEIR project. The CAS process will be configured as a Modified Ludzack Ettinger (MLE) process.² The project also includes deammonification³ as a sidestream nitrogen removal process. The aeration basins and secondary clarifiers would be uncovered and located on the eastern side of the main plant site. The tallest structure associated with these facilities would reach approximately 35 feet above ground elevation.

Maintenance Building

The size and location of the Maintenance Building are unchanged compared to the PEIR project; the facility is described on PEIR page 3-29, and would replace the functionality of the existing maintenance shop, maintenance storage yard, instrumentation stop, and primary control building (shown on Figure 3). Landscaping and yard space for storage and vehicle access would surround the building.

Thickening and Dewatering Facility Stage 1

The Thickening and Dewatering Facility would thicken secondary sludge produced by the new secondary treatment improvements and dewater digested biosolids produced by the anaerobic digestion process. The components of this facility would include:

- Building to house equipment
- Thickening equipment

• Thickened waste activated sludge pumps

² The MLE process configuration is one of many activated sludge basin designs. This configuration was established in 1962 and includes an anoxic zone (unaerated but mixed) at the beginning end of the tank to optimize nitrogen removal.

³ Deammonification is a two-step biological process where ammonia-oxidizing bacteria aerobically convert half of the ammonia present in the wastewater to nitrite. In the second step, anammox bacteria oxidize the ammonia using nitrite to produce nitrogen gas without the organic carbon substrate required for conventional heterotrophic denitrification. Deammonification requires significantly less oxygen and so less energy is needed for nitrogen removal.

- Thickening polymer storage and feed system
- Digester sludge feed piping upgrades
- Digester sludge storage tank
- Dewatering equipment
- Cake pumps

- Dewatering filtrate return pump station and piping
- Dewatering polymer storage and feed system
- Cake storage hopper and truck loading facility (cake loading)
- Odor control system with bioscrubber

As summarized in Table 2-1, these facilities would generally be the same as the thickening and dewatering facilities described in the PEIR (PEIR pages 3-24 and 3-25). The maximum height of these structures would be 55 feet above grade, approximately five feet taller than the relevant structures evaluated in the PEIR. All components would be located within the thickening and dewatering building with the exception of polymer storage, digester sludge storage, cake loading, and odor control. Polymer storage, cake loading, and odor control facilities would be covered or contained and located adjacent to the thickening and dewatering building. The digester sludge storage tank would be a separate covered structure. Yard piping would be upgraded to connect the new facilities to the existing WPCP facilities.

Support Facilities

Electrical Distribution System and Combined Heat and Power

Stage 2 of the 12 kV electrical distribution system would extend the 12kV primary power to all remaining facilities at the WPCP.

A 2 megawatt (MW) standby generator would be installed to provide full backup power for the anticipated electrical loads at the WPCP. This generator would run on diesel and would only be used in an emergency when utility power is not available, and during routine monthly maintenance (up to 50 hours per year). The generator would not be used in normal operations.

Advanced Control Systems Improvements – Stage 2

The WPCP fiber optic duct banks would be expanded to remaining facilities at the WPCP, including a 72 strand single-mode fiber optics cable installed in a loop and communications cabinets. Computer programming would be conducted to migrate network connectivity of the existing equipment over to the new controls system. No new structures would be constructed for these improvements.

Digester Supernatant Pump Station and Drainage Piping

Several components of the existing pump station and drainage piping would be rehabilitated. No new structures would be constructed for these improvements. The project includes repair of concrete within the supernatant pump station, replacement of the digester supernatant pumps, and repair of portions of drainage piping from the digesters to the supernatant pump station.

Flood Protection

A flood wall may be constructed along approximately 750 feet of the southern side of the main plant site, extending from the driveway southwest of the new primary treatment facilities to the west gate driveway. The floodwall top elevation would be approximately 14 feet NAVD88 (approximately 5 feet above ground surface).

Construction

Schedule and Workforce

Project construction would proceed in three general phases, with some overlap between phases, and last approximately 3.5 years. The first phase, consisting of site demolition, surcharging, and site preparation, would occur between November 2020 and October 2021. The second phase would include earthwork and site work for structures and would extend for approximately one year between January 2021 and January 2022. Facilities would be constructed during the third phase, lasting from January 2022 through April 2024.

On average, approximately 130 construction personnel would be onsite daily. At peak construction, up to 230 construction personnel may be onsite each day. Project construction would occur primarily within normal City working hours, weekdays between the hours of 7:00 a.m. and 6:00 p.m., and, as necessary, Saturdays between 8:00 a.m. and 5:00 p.m.⁴

Equipment

Heavy equipment that would be used for construction of this project includes the following. equipment (the estimated usage of which is documented in **Appendix A**).

- Excavator
- Grader
- Haul trucks
- Dozer/Loader
- Roller

- Paving equipment
- Concrete trucks
- Water trucks
- Crawler cranes and rough terrain cranes
- Pile drivers

Access and Staging

Construction activities would occur within the main plant. Construction vehicles would access the main plant via Borregas Avenue and Carl Road. **Figure 7** illustrates potential construction staging areas and site access.

⁴ Sunnyvale Municipal Code Section 16.08.030 normally limits construction activity to these hours.

Demolition, Surcharging, and Site Preparation

The existing primary sedimentation basins, maintenance shop, administration building, and primary control building would be demolished. Figure 3 identifies these existing facilities. Demolition would require initial shoring around existing structures and foundations, excavation, and removal of structures. Demolition would also require offhaul of debris for disposal or reuse. The areas would be graded after demolition.

On the east area of the site, it is assumed pre-consolidation will likely be necessary to compact the soils prior to construction. Clean fill material would be imported and approximately 10 feet of soil would be deposited on the site for approximately 6 months. When consolidated, this imported fill will need to be offhauled, but some may be used to backfill the primary clarifier area after demolition.

The site would be prepared for the construction of the facilities, including grading to the finished elevation and setting up contractor staging areas and construction trailers.

Earthwork and Site Work for Structures

Initial steps of site work include driving sheeting and shoring for the excavation of the main structures. Following placement of shoring, the areas for these structures would be excavated. Some of the excavated material would be stockpiled for backfill, while most would be offhauled. This phase also includes the import of stone base material for preparation of the foundations. Average daily construction truck trips would reach a peak of 73 one-way trips per day during these activities.

Facility Construction

After initial earthwork is complete, concrete slabs and walls for the major structures would be installed. Although it is anticipated that concrete slab foundations would be used, pile driving for structural foundation improvements may also be needed based on the results of geotechnical investigations. Subsequent construction activities include construction of associated mechanical, structural, and electrical facilities. This phase includes excavation throughout the site for yard piping and electrical duct banks. Jack and Bore may be required for a short segment of the secondary effluent pipe within areas of the main plant. The remainder of linear facilities would be installed using trenched construction. Support utilities would also be installed. After structures and piping are complete, the site would be paved.



SOURCE: ESA; Base Map Google Earth

Sunnyvale Secondary Treatment and Dewatering Facilities Figure 7 Construction Staging and Access



Operations

As described in PEIR Section 3.4.3, page 3-16, the proposed secondary treatment and dewatering facilities would operate in parallel with the existing secondary treatment system (e.g., Ponds 1 and 2, fixed growth reactors, and air flotation tanks). Primary effluent would be split between the project facilities and Ponds 1 and 2, using an operations approach called "split flow mode." WPCP operators would maintain flow to the oxidation ponds to meet the process needs of that system. Once the project is complete, the WPCP would operate under "split flow mode" for about 10 years. Eventually the City plans to fully replace the existing secondary treatment process by the end of the Master Plan period (approximately 2035). The City would determine the need for supplemental CEQA documentation on the full transition to CAS once conceptual design of CAS Stage 2 is complete.

The new facilities in this project would increase the power demands at the WPCP. Primary power for the proposed facilities would be supplied by PG&E and Silicon Valley Clean Energy (SVCE)⁵ via a new switchgear building being constructed as part of another project and from the power generation facility, an onsite cogeneration facility that runs on digester gas, landfill gas, and natural gas if needed. Along with other projects at the WPCP, the overall WPCP's demand would exceed the capacity of the power generation facility once the project is operational. The project facilities would require an additional average load of approximately 1,000 kilowatts. All of the electrical demand for the facilities proposed in this project would be met by increased PG&E and SVCE supply.

No new staff would be needed to operate the new facilities. The work force would remain at 34 operations and maintenance staff. Operations of the project would require 42 chemical deliveries per month and 19 residuals hauling trucks per week.

⁵ PG&E is responsible for delivering electricity, while SVCE is responsible for securing electricity supply and determining supply portfolio. Currently, the City's electricity accounts use SVCE's "GreenPrime" option, which provides 100% renewable energy.

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CHAPTER 3 Evaluation of Environmental Impacts

The evaluations in the Program Environmental Impact Report (PEIR) were revisited to determine whether any changes to the analyses were warranted based on refinements to the Secondary Treatment and Dewatering Facilities project (project). This chapter describes any changes that have occurred in the existing environmental conditions within and near the project area as well as environmental impacts associated with the project. The analysis includes consideration of the mitigation measures adopted for the Master Plan as part of the Mitigation Monitoring and Reporting Program (MMRP). Chapter 5, *Mitigation Monitoring and Reporting Program*, contains all of the mitigation measures from the adopted MMRP that apply to the project.

The PEIR evaluated impacts of combinations of individual improvements as they were expected to progress at the time of PEIR preparation. The phasing for the Master Plan improvements has changed as design progressed for individual improvements. Project construction is expected to overlap with construction of the Administration/Lab Building and Existing WPCP Rehabilitation projects at the WPCP. Project construction may also overlap with the Sunnyvale East-West Channels Flood Protection project and the 360 Caribbean Drive Project, which would demolish existing office and manufacturing buildings and develop two new research and development buildings in the same location. Where relevant, cumulative impacts of this scenario are discussed.

The topics listed below were sufficiently addressed in the PEIR and required no additional analysis because either the nature, scale, and timing of the project has not changed in ways relevant to the topic or there has not been a substantial change in the circumstances involving the topic on the project site, nor in the local environment surrounding the site.

- Agriculture and Forestry Resources. The state and local land use and zoning designations with respect to agricultural and forest resources have not changed for the site and surroundings, and agricultural or forest use of the site has not commenced since adoption of the PEIR. Thus there has not been a substantial change in the circumstances involving agricultural and forest resources at the site or surrounding areas.
- **Biological Resources.** Habitat in the project area has not changed since adoption of the PEIR. The locations of ground disturbance have not changed in ways relevant to biological resources. The state and local plan designations relevant to biological resources within and surrounding the project site have not changed. Applicable mitigation measures are included in Chapter 5.
- **Cultural Resources.** The locations of ground disturbance have not changed in ways relevant to historical, archeological, and paleontological resources at the site or surrounding areas. Applicable mitigation measures are included in Chapter 5.

- Energy Conservation. The construction and operation equipment and activities proposed for the project would be similar to that evaluated in the PEIR. The increased electrical demand from PG&E and SCVE for this project is within the demand estimated for Master Plan projects in the PEIR (3,100 kW). The Caribbean Drive Parking and Trail Access Enhancements Project is the only other Master Plan project evaluated in the PEIR that has undergone subsequent review under CEQA, and would not require electricity during operations.
- **Geology, Soils, Seismicity, and Mineral Resources**. The nature, scale, and timing of the project have not changed in a manner that would exacerbate existing geologic and seismic hazards at the project site. The state and local land use and zoning designations with respect to mineral resources have not changed for the site and surroundings.
- **Hazards and Hazardous Materials**. The locations of ground disturbance have not changed in ways relevant to hazards and hazardous materials at the site or surrounding areas. Applicable mitigation measures are included in Chapter 5.
- Land Use and Recreation. The state and local land use plans, policies, and regulations applicable at the site have not changed since adoption of the PEIR, and the character of the project would remain industrial.
- Noise and Vibration. As described in Chapter 2, the project would not involve construction activity outside of the hours of 7:00 a.m. to 6:00 p.m. The nearest residences to the project site are approximately 0.8 miles away and separated from the area by the intervening commercial and industrial land uses and State Route 237. No new receptors closer than those identified in the PEIR occur in the vicinity of the project site. The types of equipment and number of construction activities occurring concurrently would be similar to those evaluated in the PEIR for other Master Plan projects. The project does not include sources of noise during operations that were not evaluated in the PEIR.
- **Population and Housing**. The project does not alter the effect of the Master Plan on treatment capacity (indirectly inducing population growth) and the types of equipment and number of construction activities occurring concurrently would be similar to that evaluated in the PEIR.
- **Public Services and Facilities**. The nature of the project with respect to population growth and impairment of achieving service performance objectives has not changed.
- Utilities and Service Systems. The nature of the project with respect to wastewater collection and treatment, water use, and solid waste disposal has not changed.
- Mandatory Findings of Significance. For the reasons identified above, the cultural resources and hazardous materials effects of the project are adequately addressed in the PEIR. One additional project (resurfacing the San Francisco Bay Trail within the City of Sunnyvale and neighboring areas) that was not identified in the PEIR occurred in the vicinity of the project, another project not identified in the PEIR may be under construction concurrently with the project, and the schedule of the Sunnyvale East-West Channels project has shifted into the future; these changes in the cumulative scenario would not alter the cumulative impact conclusions of the PEIR beyond the discussions included in this addendum. The effects of the project on human beings are adequately addressed in the PEIR except for

Transportation, Air Quality, Greenhouse Gas, Hydrology and Water Quality, and Aesthetics impacts, which are discussed in this addendum.

Changes and additions to the PEIR discussion of the remaining topics are included below, pursuant to CEQA *Guidelines* Section 15164. The following discussion describes the environmental impacts of the project as compared to the impacts of the approved Master Plan as addressed in the PEIR adopted August 23, 2016. These additions do not reflect involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; for these reasons, a subsequent EIR was not prepared.

Transportation

Issi	es (and Supporting Information Sources):	New Potentially Significant Impact	New Less Than Significant with Mitigation Incorporated	New Less Than Significant Impact	Same Impact as Approved Project	Less Impact than Approved project
16.	TRANSPORTATION/TRAFFIC — Would the project:					
a)	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?					
b)	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?					
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				\boxtimes	
d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				\boxtimes	
e)	Result in inadequate emergency access?				\boxtimes	
f)	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				\boxtimes	

Setting

The environmental setting relevant to Transportation for the project has not changed relative to the setting in the PEIR. Existing traffic patterns, the transit network, and alternative transportation facilities have not changed since adoption of the PEIR. Setting discussions from the adopted PEIR for this resource are therefore applicable to the entire project area.

Findings of Previously Adopted PEIR

The adopted PEIR determined that all project impacts related to transportation would be less than significant or less than significant with mitigation. Chapter 5, *Mitigation Monitoring and Reporting Program*, reproduces select adopted mitigation measures applicable to transportation impacts.

Discussion

Congestion Management Program

As discussed in the PEIR, Caribbean Drive is the CMP system network roadway nearest to the Master Plan and the project area. The project would not generate new (increased) traffic once operational, so the volume of traffic on Caribbean Drive would not change as a result of the project. The average weekday daily traffic on Caribbean Drive (12,883) is slightly less than that identified in the PEIR (13,248 vehicles) (Kimley Horn, 2017).

Air Traffic Patterns

The project would not construct facilities taller than ground-level in areas not previously evaluated in the PEIR. There would be no impact.

Measures of Effectiveness for the Performance of the Circulation System

The Master Plan would have a peak of 564 one-way truck trips per day during construction; the project would have a maximum of 73 one-way truck trips per day during construction. The 130 construction workers would likely commute to and from the work site during peak hours. Truck trips and construction worker trips that would coincide with peak-hour traffic could impede traffic flow on local roadways, a potentially significant impact. With implementation of adopted Mitigation Measures TR-1a and TR-1b, this impact would be reduced to less-than-significant levels, and the impact would not be more severe than that identified in the approved PEIR.

Traffic Safety Hazards

During construction, while the number of haul trucks would be substantially lower than evaluated in the PEIR, traffic safety hazards could occur due to increased truck traffic with associated slower speeds and wider turning radii and where delivery and haul trucks share the roadway with other vehicles, the same impact as discussed in the PEIR. With implementation of adopted Mitigation Measure TR-1b, the impact of these potential construction traffic safety hazards would be less than significant with mitigation. There would be no change to lane or roadway configuration as part of the project; therefore, the operational effects of the project would be the same as those identified in the PEIR (less than significant). No new or more severe environmental impacts related to traffic safety would result from project implementation.

Emergency Access

The project would not result in new or more adverse impacts related to emergency access because the project would not alter access to facilities served by emergency vehicles and personnel. The project does not include design features that would either impede or restrict emergency vehicle access. No new or more severe environmental impacts related to emergency access would result from project implementation.

Alternative Transportation Facilities

The project would not directly or indirectly eliminate alternative transportation corridors or facilities, nor would it include changes in adopted policies, plans, or programs that support

alternative transportation. No new or more severe environmental impacts related to alternative transportation facilities would result from project implementation.

Cumulative Transportation Impacts During Construction

At the time of PEIR preparation, details typically used to determine cumulative transportation effects were not known. The PEIR estimated cumulative transportation effects by assuming a worst-case scenario in which construction peak periods overlap for most of the projects identified in the PEIR cumulative scenario (listed in PEIR Table 6-1). Project construction would overlap with construction of the Administrative/Lab building and existing facilities rehabilitation at the WPCP. Project construction may also overlap with construction of the Sunnyvale East-West Channels Flood Protection project and the 360 Caribbean Drive project. It is possible that service levels along Caribbean Drive could be temporarily degraded by construction activity. With implementation of adopted Mitigation Measure C-TR-1, Implement Coordinated Transportation Management Plan, the project's construction to a potential cumulative impact along Caribbean Drive would be less than cumulatively considerable.

Conclusion

The project would not generate substantially more operational or construction vehicle trips than those identified in the previously approved PEIR, and therefore would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, or conflict with an applicable congestion management program. (**Same Impact as Previously Approved Project [Less than Significant Impact]**)

Implementation of the adopted mitigation measures applicable to transportation would reduce possible impacts associated with a reduction in roadway capacity and potential impacts to emergency access during construction of the project to a less than significant level, and the project would not result in any new or more significant impacts. (Same Impact as Previously Approved Project [Less than Significant Impact with Mitigation])

The Project would not result in new or more significant impacts to public transit, bicycle and pedestrian facilities, or traffic-related hazards than those identified in the previously approved PEIR. (Same Impact as Previously Approved Project [Less than Significant Impact])

With the implementation of adopted Mitigation Measure C-TR-1 to reduce the project's possible contribution to cumulative transportation impacts, the project would not result in any new or more significant impacts than those identified in the previously adopted PEIR. (Same Impact as **Previously Approved Project [Less than Significant Impact with Mitigation]**)

Air Quality

Issi	es (and Supporting Information Sources):	New Potentially Significant Impact	New Less Than Significant with Mitigation Incorporated	New Less Than Significant Impact	Same Impact as Approved Project	Less Impact than Approved Project
3.	AIR QUALITY — Would the project:					
a)	Conflict with or obstruct implementation of the applicable air quality plan?				\boxtimes	
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				\boxtimes	
c)	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)?					
d)	Expose sensitive receptors to substantial pollutant concentrations?				\boxtimes	
e)	Create objectionable odors affecting a substantial number of people?				\boxtimes	

Setting

Air Quality Plans

Regional air quality planning has proceeded since adoption of the PEIR. On April 19, 2017, the BAAQMD adopted the most recent revision to the Clean Air Plan – the 2017 Clean Air Plan: Spare the Air Cool the Climate (2017 CAP). The primary goals of the 2017 CAP are to protect public health and protect the climate (BAAQMD, 2017). The plan includes a wide range of control measures to reduce emissions from combustion-related activities, reduce fossil fuel combustion, improve energy efficiency, and decrease emissions of potent greenhouse gases (GHGs). Some measures focus on reducing individual pollutants such as potent GHGs like methane and black carbon, or harmful fine particles that affect public health. Many of the measures, however, reduce multiple pollutants and serve both to protect public health and to protect the climate.

The 2017 Plan updates the *2010 Clean Air Plan*, pursuant to air quality planning requirements defined in the California Health and Safety Code. It describes a multi-pollutant strategy to simultaneously reduce emissions and ambient concentrations of ozone, fine particulate matter, toxic air contaminants, as well as greenhouse gases that contribute to climate change. To fulfill state ozone planning requirements, the 2017 control strategy includes all feasible measures to reduce emissions of ozone precursors—reactive organic gases (ROG) and nitrogen oxides (NOx)—and to reduce transport of ozone and its precursors to neighboring air basins. In addition, the Plan builds upon and enhances the Air District's efforts to reduce emissions of fine particulate matter and toxic air contaminants (BAAQMD, 2017). In addition, the 2017 CAP includes the Bay Area's first-ever comprehensive Regional Climate Protection Strategy (RCPS), which will identify potential rules, control measures, and strategies that the BAAQMD can pursue to reduce

greenhouse gases in the Bay Area and lay the groundwork to attain ambitious GHG reduction targets for 2030 and 2050.

The state and federal non-attainment status of the San Francisco Bay Area Air Basin (SFBAAB) has not changed since adoption of the PEIR. At the time of PEIR adoption, the SFBAAB was designated as a nonattainment area for state and national ozone standards, state particulate matter (PM₁₀ and PM_{2.5}) standards, and federal PM_{2.5} (24-hour) standard.

BAAQMD Rules, Regulations, and CEQA Guidelines

Since adoption of the PEIR, the BAAQMD CEQA Air Quality Guidelines, which were used to evaluate the potential effects of the project on air quality, faced legal challenge in the State Supreme Court. While the significance thresholds originally adopted by BAAQMD in 2011 are not currently recommended by the BAAQMD, there is no court order preventing their use, and they are frequently employed by lead agencies when conducting CEQA reviews because the BAAQMD 2011 guidelines provides substantial evidence for the derivation of the thresholds and the approach to employing them in an air quality impact analysis (BAAQMD, 2009). The State Court of Appeals agreed with BAAQMD that there were scenarios in which the thresholds could be used to properly assess whether and in what amount a project would add pollution to the environment. Consequently, the approach used in the PEIR remains the latest state-of-the-art guidance and no changes to the approach used in the PEIR are warranted at this time.

The BAAQMD is also the agency responsible for investigating and controlling odor complaints in the area. The BAAQMD enforces odor control by helping the public document a public nuisance. Upon receipt of a complaint, the BAAQMD sends an investigator to interview the complainant and to locate the odor source if possible. The BAAQMD typically brings a public nuisance court action when there are a substantial number of confirmed odor events within a 24-hour period. An odor source with five or more confirmed complaints per year averaged over three years is considered to have a substantial effect on receptors.

There are several BAAQMD regulations and rules that apply to odorous emissions that could be generated by the WPCP. Regulation 1, Rule 301 is the nuisance provision that states sources cannot emit air contaminants that cause nuisance to a considerable number of persons. Regulation 9, Rule 2 limits ground level concentration of H_2S .¹ Regulation 7 specifies limits for the discharge of odorous substances where the BAAQMD receives complaints from ten or more complainants within a 90-day period. Among other things, Regulation 7 precludes discharge of an odorous substance that causes the ambient air at or beyond the property line to be odorous after dilution with four parts of odor-free air (i.e., 5 D/T), and specifies maximum limits on the emission of certain odorous compounds.²

¹ BAAQMD, Rules & Regulations, Regulation 9 – Inorganic Gaseous Pollutants, Rule 2 – Hydrogen Sulfide, last amended October 6, 1999.

² BAAQMD, Rules & Regulations, Regulation 7 – Odorous Substances, last amended March 17, 1982.

The WPCP is currently subject to the Operating Permit requirements of Title V of the federal Clean Air Act. BAAQMD is responsible for issuing Title V permits. The most recent application for renewal of the permit for the WPCP (Facility #A0733) was submitted in November 2017.

Sensitive Receptors

No new residential buildings, schools, colleges or universities, daycare facilities, hospitals, or senior-care facilities have been constructed closer to the WPCP than the sensitive receptors identified in the PEIR (located immediately south of State Route 237, 0.8-mile from the project site).

Findings of the Previously Adopted PEIR

The PEIR identified significant and unavoidable impacts associated with the project related to the potential to conflict with the applicable air quality plan and the potential to violate any air quality standard or contribute to an air quality violation. The extent to which the project could result in a cumulatively considerable net increase of criteria air pollutant emissions, expose sensitive receptors to pollutant concentrations, and the potential of the project to create objectionable odors affecting a substantial number of people were determined to be less than significant impacts. One of the mitigation measures identified in the PEIR and subsequently adopted by the City (Mitigation Measure AQ-2a) is reproduced in Chapter 5, *Mitigation Monitoring and Reporting Program*.

Table 3-1 reproduces relevant portions of PEIR Table 4.5-4 (from PEIR page 4.5-17) for reference, and summarizes emissions estimated for construction of the proposed project and relevant WPCP projects that may overlap with proposed project construction.

	Average Daily Emissions (pounds per day)				s per day)
Master Plan Construction Stage ^a	ROG	NOx	PM 10	PM _{2.5}	Likely to be Significant?
1A – Existing WPCP Rehabilitation	NA	NA	NA	NA	Yes
1B – Demolition of Primary Sedimentation Tanks and Relocation of Bay Trail head	2.2	20.1	1.5	1.6	No
2A – Split Flow Conventional Activated Sludge Milestone 1	0.8	4.4	0.3	0.2	No
2B – Construction of Administration/Lab building	0.8	3.5	0.2	0.1	No
2D – Maintenance Building	0.3	1.6	0.1	0.1	No
2E - Split Flow Conventional Activated Sludge Milestone 2	1.8	10.6	0.6	0.6	No
2F - Split Flow Conventional Activated Sludge Milestone 3 (Thickening & Dewatering)	1.3	5.9	0.3	0.2	No
Significance Thresholds	54	54	82	54	

 TABLE 3-1

 MASTER PLAN AVERAGE DAILY CONSTRUCTION EXHAUST EMISSIONS

NA = Not Available

a Includes the proposed project evaluated in this document (Secondary Treatment and Dewatering Facilities, reflected as part of stages 1B, 2A, 2D, 2E, and 2F in this table) and the other Master Plan project that, based on the current Master Plan implementation schedule, could be constructed concurrent with the proposed project (i.e., 1A and 2B in this table).

NOTE: Refer to PEIR Appendix B for assumptions and emissions estimate calculations.

SOURCE: Sunnyvale Water Pollution Control Plant Master Plan Program Environmental Impact Report, City of Sunnyvale, August 2016.

Discussion

Violation of Air Quality Standards

Construction

At the time of PEIR preparation, details typically used to calculate air pollutant emissions (such as the number of pieces of each type of off- and on-road equipment and daily equipment usage rates in terms of hours per day and total days of use) were not known. The PEIR estimated the anticipated air pollutant emissions of WPCP projects by estimating the relative magnitude of construction activity compared to other, better defined projects planned at the site. The City anticipated that when project-level CEQA review of Master Plan improvements is initiated, the PEIR analysis would be reviewed in light of updated construction information and analysis of air pollutant emissions would be revised accordingly.

Construction details of the project are sufficiently known to calculate conservative air pollutant emissions during construction. Air pollutant emissions of ROG, NO_X , PM_{10} , and $PM_{2.5}$ that would be generated by off-road construction equipment (e.g., excavators, graders, loaders) were estimated using the OFFROAD2017 emission factors along with the Project-specific construction schedule and equipment requirements that would be used during the following construction phases of the project:

- Phase 1: Site demolition, surcharging & site preparation November 2020 to October 2021
- Phase 2: Earthwork & site work for structures January 2021 January 2022
- Phase 3: Facility Construction January 2022 to April 2024

Project construction emissions were estimates assuming that construction would begin in November 2020 and would take approximately 1,176 workdays to complete over a period of approximately 42 months. Average daily construction emissions were estimated by dividing the total construction emissions by the number of workdays.

Emissions from construction equipment were estimated using project-specific information such as the types and number of construction equipment used, their horsepower rating, daily usage in terms of hours per day, and the number of days each piece of equipment is used within the construction period.

Emissions from on-road motor vehicles used during construction were estimated by multiplying EMFAC2014 emissions factors with the estimated total miles travelled by project-related worker vehicles and trucks. Based on data from the applicant, the project is assumed to generate an average of 260 worker commute trips per day throughout the construction period. The number of material delivery and off-haul trips varies by construction phase and are detailed in Appendix A. The exact end points for the daily trips are not known at this time, so the on-road emission estimates were developed under the assumption that each worker trip would be 25 miles round trip, and each haul truck and material delivery trip would be 50 miles round trip. Daily emissions by vehicle class (i.e., light-duty gasoline-fueled trucks and heavy-duty trucks) were estimated using the EMFAC2014 emission factors multiplied by the estimated project-related vehicle trips and the estimated daily mileage traveled by the vehicles.

All assumptions and calculations used to estimate the project-related construction emissions are provided in Appendix A. Estimated average daily emissions are shown in **Table 3-2** and are compared to the BAAQMD thresholds.

Construction Phase	Number of workdays	ROG	NOx	Exhaust PM ₁₀ ª	Exhaust PM _{2.5} ª	
Phase 1	336	2.3	24.3	1.1	0.7	
Phase 2	252	2.5	29.6	1.3	0.8	
Phase 3	588	1.9	13.8	0.8	0.5	
Project Average	1176	2.1	20.2	1.0	0.6	
BAAQMD Construction Threshold		54	54	82	54	
Significant Impact?		No	No	No	No	

 TABLE 3-2

 AVERAGE DAILY CONSTRUCTION-RELATED POLLUTANT EMISSIONS FOR THE PROPOSED PROJECT (POUNDS/DAY)

NOTES:

^a BAAQMD's construction-related significance thresholds for PM₁₀ and PM_{2.5} apply to exhaust emissions only and not to fugitive dust.

SOURCE: Appendix A

In addition to exhaust emissions, the PEIR evaluated emissions of fugitive dust from construction activities. As described in the PEIR, for all projects, the BAAQMD recommends the implementation of its Basic Control Mitigation Measures whether or not construction-related exhaust emissions exceed the applicable significance thresholds. The BAAQMD Basic Control Mitigation Measures were adopted by the City as Mitigation Measure AQ-2a (included in Chapter 5 of this document). As indicated in Table 3-2, the average daily construction exhaust emissions would not exceed the BAAQMD's significance thresholds. Therefore, impacts associated with the potential for construction-related exhaust emissions to result in or contribute to a violation of an air quality standard would be less than significant.

Table 3-1 includes emissions estimates from the PEIR for the Administration Building project (stage 2B). The Existing WPCP Rehabilitation project (stage 1A) has not yet progressed into design; as was the case in the PEIR, the scale of construction of this project remains not well understood. Combining the current emissions estimates for the proposed project shown in Table 3-2 with the emissions estimates for these other Master Plan project that could be constructed concurrently (shown in Table 3-1), the average daily construction exhaust emissions for the projects together could therefore exceed the BAAQMD's significance thresholds, despite the fact that the project's construction emissions shown in Table 3-2 would be substantially lower than the combined emissions of the equivalent stages in the Master Plan PEIR (the combination of emissions for stages 1B, 2A, 2D, 2E, and 2F shown in Table 3-1). Without sufficient information to estimate construction-related air pollutant emissions that would be associated with the Existing WPCP Rehabilitation project, it cannot be substantiated that implementation of adopted Mitigation Measures 2a and 2b would be adequate to reduce the associated impact of concurrent Master Plan project construction to a less-than-significant level.

Operation

No new staff would be required to operate the project, therefore there would be no increase in the employee commute trips to the facility. Criteria air pollutant emissions during project operation would result primarily from truck trips for material delivery and hauling of residuals. It is estimated that the project would result in 42 chemical deliveries per month and 19 residuals hauling trucks per week (same as buildout for PEIR). In addition, emissions would be generated from the testing and maintenance of the 2,000 kW emergency standby generator proposed as part of the project. Emissions from truck trips were estimated using EMFAC2014 emission factors assuming a one-way trip length of 25 miles. Consistent with BAAQMD Regulation 9, Rule 8, a maximum operation of 50 hours per year and 1 hour per day was used for testing and maintenance. As shown in **Table 3-3** below, operational emissions would be less than the BAAQMD significance thresholds. Therefore, the impact would be less than significant.

		•		
Construction Phase	ROG	NOx	PM 10	PM _{2.5}
Chemical delivery & Residual Haul Truck Trips	<0.1	2.0	<0.1	<0.1
Emergency Generator	0.2	3.2	<0.1	<0.1
Project Total	0.2	5.2	0.1	0.07
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	No	No	No	No
SOURCE: Appendix A				

 TABLE 3-3

 PROJECT OPERATIONAL POLLUTANT EMISSIONS (POUNDS/DAY)

Consistency with Air Quality Plan

As described in the PEIR, the BAAQMD recommends that a project's consistency with the current air quality plan be evaluated using the following three criteria:

- a. The project supports the goals of the air quality plan
- b. The project includes applicable control measures from the air quality plan, and
- c. The project does not disrupt or hinder implementation of any control measures from the air quality plan.

Since approval of the PEIR, the air quality plan has been updated. The primary goals of the 2017 *Clean Air Plan* are to protect public health and protect the climate. The BAAQMD-recommended method for determining if a project supports the goals of the current air quality plan is consistency with BAAQMD thresholds of significance. As discussed in this addendum, the project could result in significant construction emissions, but would not result in long-term adverse air quality impacts. Therefore, project construction could be inconsistent with the 2017 Clean Air Plan. Project operations would be considered supportive of the primary goals of the 2017 Clean Air Plan.
The 2017 Clean Air Plan has 85 control measures, more than the 55 included in the 2010 Clean Air Plan. Two of the stationary source control measures are applicable to operation of water pollution control plants: WR1 (Limit GHGs from POTWs [Publicly-Owned Treatment Works]) and WR2 (Support Water Conservation). While both of these measures do not contain specific emissions control strategies, the project would not be inconsistent with these measures as the project would not affect existing methane capture at the WPCP, would not affect production of recycled water at the WPCP, and would not exceed BAAQMD operational thresholds for criteria air pollutants. For these reasons, the project with modifications would not be inconsistent with nor hinder implementation of the 2017 Clean Air Plan control measures.

Cumulative Increase in Pollutants

As described in the PEIR (page 4.5-12), a project's emissions would be considered cumulatively considerable if the project emissions exceed the identified significance thresholds. For the reasons described above, the project along with other Master Plan projects at the WPCP could result in significant and unavoidable impacts associated with construction emissions, and less-thansignificant impacts associated with operational emissions of criteria air pollutants. Therefore, the project could result in a cumulatively considerable net increase in the criteria pollutants for which the Bay Area is in nonattainment.

Exposure of Sensitive Receptors

As noted above, no new sensitive receptors are located closer to the project area than those identified in the PEIR. For this reason, the project's effects associated with exposure of sensitive receptors to pollutants would be no greater than those identified in the PEIR and would be less than significant.

Odorous Emissions

Odors can be generated and released from many wastewater treatment processes. Most odorproducing compounds found in domestic wastewater result from biological activity that consumes organic material, sulfur, and nitrogen found in wastewater. These odor-producing compounds can be organic or inorganic molecules; the two primary odorous inorganic gases are hydrogen sulfide (H2S) and ammonia.³

The BAAQMD has developed a list of recommended odor screening distances for specific odorgenerating facilities such as wastewater treatment plants. If a proposed project would include the operation of an odor source, the screening distances should be used to evaluate the potential impact to existing sensitive receptors. The BAAQMD recommends that the screening distances be used as indicators of how much additional analysis would be required rather than the sole indicator of impact significance. The BAAQMD odor screening distance for wastewater treatment plants is 2 miles. The closest residences to the WPCP are single-family residences immediately south of SR 237, which are approximately 0.8 miles from the WPCP's boundary. In

Sunnyvale Secondary Treatment and Dewatering Facilities Addendum to the PEIR

³ H2S is regulated as a nuisance based on its odor detection level. If the standard were based on adverse health effects, it would be set at a much higher level. The H2S standard was adopted for the purpose of odor control. The current standard, 0.03 ppm for a one hour average, was adopted by ARB in 1969.

addition, winds in the area tend to be southeasterly. In response, additional analysis, including a review of existing odor complaint data, is presented in this addendum.

A review of BAAQMD odor complaint data compiled for the Sunnyvale WPCP indicates that there has been one confirmed odor complaint south of the WPCP in the January 2007 through August 2014 period (BAAQMD, 2015); there have been no odor complaints directly to the City about the WPCP in the past five years (Berdeen, 2015; Tovar, 2018). Although BAAQMD records do not identify the specific source of the confirmed odor incident, which occurred in 2009, WPCP staff investigating the incident detected a slight hydrogen sulfide odor along the south boundary of Pond 2, took measurements of dissolved oxygen levels in the ponds, and sampled for hydrogen sulfide around the ponds. Plant operators were unable to confirm that the source of the odor that led to the complaint was one of the ponds (as opposed to Bay muds).

The BAAQMD considers an existing source to have a substantial number of odor complaints and an associated significant odor impact if the complaint history for the facility includes five or more confirmed complaints per year averaged over a 3-year period. There was one confirmed odor complaint identified by BAAQMD during the time period referenced above; the WPCP has not been notified by the BAAQMD of any additional odor complaints since 2014. Therefore, in accordance with BAAQMD standards, the WPCP would not be considered to have a substantial number of odor complaints nor constitute an existing significant source of odors.

Under existing conditions, the ponds are not covered and sludge dewatering occurs in mechanized dewatering units, where emissions of potentially odorous compounds may escape directly to the atmosphere. Prior to construction activities associated with the Primary Treatment Facility, digested sludge was dewatered on open-air tile beds. The proposed aeration basins, which would treat a portion of wastewater that would otherwise be treated in the ponds, would also be uncovered.

The ponds as currently used, while a potential source of odorous emissions such as hydrogen sulfide and ammonia, have not been the subject of odor complaints. The proposed aeration basins may result in emissions of odorous compounds that could result in potential odor complaints. However, once the new Thickening and Dewatering Building is operational, solids dewatering would occur within the building and would include odor abatement technology, such as a bioscrubber or biotrickling filter to treat ventilated air from the building. With implementation of the project, the dewatering facilities, a process with greater odor potential than the proposed aeration basins, are more likely to have lower emissions of odorous gases such as hydrogen sulfide compared to existing conditions and the project as a whole is likely to have a decreased potential for odor complaints. Health impacts associated with odorous compounds like hydrogen sulfide that may be potentially emitted after the implementation of the project are also likely to be lower than under the existing conditions and will be further addressed, as required, as part of the BAAOMD permitting process. Since the nearest sensitive receptors have not changed, the overall treatment capacity of the WPCP would remain unchanged, the current WPCP operations do not have a history of odor complaints, and the project would reduce emissions of odorous gases from dewatering of sludge, it is likely that odors emitted from the project would be reduced compared to the current operation and impacts would be less than significant.

Conclusion

While construction emissions associated with the Secondary Treatment and Dewatering Facilities project would be below BAAQMD thresholds with the implementation of adopted Mitigation Measure AQ-2a, insufficient information is available at this time to substantiate whether mitigation would be adequate to reduce emissions from construction of the project along with other projects at the WPCP (in particular the Existing WPCP Rehabilitation) to a less-thansignificant level. (Same Impact as Previously Approved Project [Significant and Unavoidable])

The project would not result in additional exposure of sensitive receptors to substantial pollutant concentrations, or create additional objectionable odors affecting a substantial number of people and thus would not result in any new or more significant impacts than those identified in the previously adopted PEIR. (Same Impact as Previously Approved Project [Less than Significant Impact])

Greenhouse Gas Emissions

Iss	ues (and Supporting Information Sources):	New Potentially Significant Impact	New Less Than Significant with Mitigation Incorporated	New Less Than Significant Impact	Same Impact as Approved Project	Less Impact than Approved Project
7.	GREENHOUSE GAS EMISSIONS — Would the project:					
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				\boxtimes	
b)	Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				\boxtimes	

Setting

Updates to two of the three planning documents identified in the PEIR – the Sunnyvale Climate Action Plan (CAP) and CARB's Climate Change Scoping Plan – have not been adopted since PEIR approval. As discussed above in Air Quality, the BAAQMD 2017 Clean Air Plan was released after approval of the PEIR.

Findings of the Previously Adopted PEIR

The PEIR identified less than significant impacts associated with the project related to conflict with plans adopted regarding GHG emissions and generation of GHG emissions.

Discussion

GHG Emissions

Construction

At the time of PEIR preparation, details typically used to calculate GHG emissions (such as the number of pieces of each type of off- and on-road equipment and daily equipment usage rates in terms of hours per day and total days of use) were not known. The PEIR estimated the anticipated GHG emissions of Master Plan by estimating the relative magnitude of construction activity compared to other, better defined projects planned at the site. The City anticipated that when project-level CEQA review of Master Plan improvements is initiated, the PEIR analysis would be reviewed in light of updated construction information and analysis of GHG emissions would be revised accordingly.

The combustion of diesel fuel to provide power for the operation of various construction equipment results in the generation of GHGs. Construction emissions that would be associated with the project were estimated using project-specific information such as the types and number of construction equipment used, their horsepower rating, daily usage in terms of hours per day, and the number of days each piece of equipment is used within the construction period. Appendix A contains the data and assumptions used to estimate the construction-phase GHG emissions that would be associated with the project. Carbon dioxide (CO₂) emissions for off-road construction equipment were estimated using OFFROAD2017 emission factors. Emission factors for and methane (CH₄) and nitrous oxide (N₂O) was obtained from The Climate Registry (TCR) for diesel fuel combustion in construction equipment (The Climate Registry, 2017a). N₂O and CH₄ emissions were multiplied by their respective global warming potentials (28 and 265) based on the IPCC Fifth Assessment Report, 2014 (AR5) and added to the CO₂ emissions to obtain carbon dioxide equivalent (CO₂e) emissions (IPCC, 2016).

GHG emissions from on-road motor vehicles used during construction were estimated using EMFAC2014 emissions factors. EMFAC provides GHG emission factors only for CO₂ and N₂O emissions; CH₄ emission factors for gasoline and diesel combustion were obtained from TCR. GHG emissions in the form of CO₂e were calculated by multiplying the estimated total miles travelled by project-related worker vehicles and trucks by the GHG emission factors, then multiplying the N₂O and CH₄ emissions by their respective global warming potential, and then adding the CO₂, N₂O, and CH₄ emissions. The project is assumed to generate an average of 260 worker commute trips per day throughout the construction period. The number of material delivery and off-haul trips varies by construction phase and are detailed in Appendix A. The exact end points for the daily trips are not known at this time, so the on-road emission estimates were developed under the assumption that each worker trip would be 25 miles round trip, and each haul truck and material delivery trip would be 50 miles round trip. Daily emissions by vehicle class (i.e., light-duty gasoline-fueled trucks and heavy-duty trucks) were estimated using the EMFAC2014 emission factors multiplied by the estimated project-related vehicle trips and the estimated daily mileage traveled by the vehicles.

Table 3-4 shows the GHG emissions estimated to be generated by construction activities that would be associated with the project. As shown in the table, project construction would generate a total of approximately 4,225 metric tons CO₂e. Refer to Appendix A for details on the calculations and assumptions used to estimate construction GHG emissions. Based on a minimum life span of 14 years for project facilities (2021 to 2035), the project's annualized construction-related GHG emissions would average 302 metric tons CO₂e. The BAAQMD does not identify a significance threshold for construction-related GHG emissions. However, when the project's construction-related annualized GHG emissions are compared to the BAAQMD's annual threshold for stationary sources of 10,000 metric tons CO₂e, the project's construction-related emissions would remain well below this threshold and would be considered less than significant.

	GHG Emissions (metric tons)				
Source	CO ₂	CH₄	N ₂ O	CO ₂ e	
Off-road Construction Equipment	596	<0.1	<0.1	600.7	
On-road Vehicle Trips	3520	0.3	0.4	3624.3	
Total GHG Emissions				4225.0	

TABLE 3-4
TOTAL ESTIMATED GHG EMISSIONS FROM CONSTRUCTION

SOURCE: Appendix A.

Operation

The project would generate long-term GHG emissions associated with electrical power consumption, vehicle travel, and the emergency generator.

Direct emission sources that would generate GHGs during operation of the project would include 42 truck trips per month associated with chemical deliveries and 76 truck trips per month associated with hauling residuals. In addition, the emergency generator will be routinely operated for testing and maintenance purposes but such activities would be limited to a maximum of 50 hours per year consistent with BAAQMD Regulation 9, Rule 8. The new facilities in this project will increase the power demands at the WPCP. After the Primary Treatment Facility project is complete, the WPCP's demand will exceed the capacity of the cogeneration facility. All of the electrical demand for the facilities proposed in this project will be met by increased SVCE supply, the generation of which will generate indirect GHG emissions.⁴ The additional power demand for the project would be approximately 1,000 kW. **Table 3-5** shows GHG emissions associated with project operation.

Source	GHG Emissions expressed as CO₂e (metric tons)
Chemical delivery & Residual Haul Truck Trips	122.6
Emergency Generator	32.6
Electricity Generation	2320.9
Total GHG Emissions	2476.1
SOURCE: Appendix A.	1

 TABLE 3-5

 GHG Emissions from Project Operation

When the project's operation-related GHG emissions are compared to the BAAQMD's annual threshold for stationary sources of 10,000 metric tons CO₂e, the project's construction-related emissions would remain below this threshold and would be considered less than significant.

Consistency with GHG Plans, Policies, or Regulations

The 2017 Clean Air Plan does not include any stationary source measures applicable to the project. The project would not disrupt or hinder implementation of any of the GHG-related 2017 Clean Air Plan control measures.

The BAAQMD GHG thresholds referenced in the discussion above were designed to meet the AB32 goal of reducing GHG emissions to 1990 levels by 2020. As discussed above, the project would not result in any temporary or new permanent sources of GHG emissions that would exceed the BAAQMD's CO2e significance threshold of 10,000 metric tons per year. Since the BAAQMD GHG significance threshold would not be exceeded, the project would not result in a

⁴ Currently, the City's electricity accounts use SVCE's "Green Prime" option, which comes from 100% renewable energy. However, for this analysis, PG&E's energy portfolio was used to generate conservative GHG emissions estimates.

cumulatively considerable increase in GHG emissions that would impair the State's ability to implement AB32.

For these reasons, the project would not result in any new or more severe environmental effects related to GHG emissions beyond those identified in the PEIR.

Conclusion

The project would not result in any new or more severe environmental effects related to GHG emissions, or conflicts with plans, policies, and regulations adopted regarding GHG emissions, than those identified in the previously adopted PEIR. (**Same Impact as Previously Approved Project [Less than Significant Impact]**)

Hydrology and Water Quality

leer	ues (and Supporting Information Sources).	New Potentially Significant	New Less Than Significant with Mitigation	New Less Than Significant	Same Impact as Approved Project	Less Impact than Approved Project
9.	HYDROLOGY AND WATER QUALITY — Would the project:		meorporateu	mpact		
a)	Violate any water quality standards or waste discharge requirements?				\boxtimes	
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre- existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?					
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?					
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?					
e)	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				\boxtimes	
f)	Otherwise substantially degrade water quality?				\boxtimes	
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				\boxtimes	
h)	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?				\boxtimes	
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				\boxtimes	
j)	Inundation by seiche, tsunami, or mudflow?				\boxtimes	

Setting

The environmental setting relevant to hydrology and water quality for the project site has not changed since adoption of the PEIR, with the exception of one NPDES permit under which the

Sunnyvale WPCP is co-permittee (described below). Setting discussions from the adopted PEIR for water quality standards, groundwater, surface water drainage patterns, and flood and inundation hazards are applicable to the project.

Effective January 1, 2018, Order No. R2-2012-0096 (Mercury and PCBs Watershed Permit, NPDES No. CA0038849) issued by the San Francisco Bay RWQCB was rescinded and replaced by Order No. R2-2017-0041. The Sunnyvale WPCP is co-permittee to this order, which sets requirements for mercury and PCB concentrations in the WPCP effluent. The effluent limitations for average monthly and maximum daily PCB concentrations are the same as those specified for the Sunnyvale WPCP in the previous order and shown in PEIR Table 4.10-7. Similarly, the effluent limitations for average weekly and monthly mercury concentrations are the same as shown in PEIR Table 4.10-7.

Findings of Previously Adopted PEIR

The adopted PEIR determined that all project impacts related to hydrology and water quality would be less than significant or less than significant with mitigation. Chapter 5, *Mitigation Monitoring and Reporting Program*, reproduces select adopted mitigation measures applicable to transportation impacts.

Discussion

The nature, scale, and timing of project construction have not changed in a manner that would deplete additional groundwater, further affect drainage patterns or systems, alter water quality or further affect flooding because the facilities would be located at the same site evaluated in the PEIR. The project would not change the wastewater treatment technologies beyond what was evaluated in the PEIR with the exception of the addition of deammonification as a sidestream nitrogen removal process. The floodwall elevation would be one foot taller than evaluated in the adopted PEIR. The following discussion focuses on differences in effluent quality and flooding during operations compared with the analysis conducted in the adopted PEIR.

Water Quality

As discussed in PEIR Impact HYD-1, stormwater from the site is routed to the preliminary treatment facility, treated, and released in compliance with the WPCP's individual NPDES permit; this would continue during project operations. Additionally, the potential for hazardous materials releases would be minimized by adherence to an updated Hazardous Materials Business Plan, which would be required under state law, and which would be updated to include project facilities.

The PEIR evaluated conversion of secondary treatment to conventional activated sludge. As discussed in PEIR Section 4.10, Water Quality, through the upgraded and new secondary treatment process, reliability and effectiveness of the secondary treatment process would be improved, and the effectiveness of subsequent treatment process would also be improved. The use of deammonification as a sidestream nitrogen removal process was not evaluated in the PEIR. Treatment of the sidestream (the internal wastewater stream generated during treatment processes at the WPCP) would reduce the ammonia and total nitrogen in the WPCP effluent. The

deammonification process proposed would not require additional treatment chemicals beyond those identified in the PEIR and any sludge generated would be treated in the digesters similar to the existing secondary treatment process. The upgraded treatment process would allow for more reliable ammonia and total nitrogen removal throughout the year than is currently achieved using Ponds 1 and 2.

The project would result in enhancements and increased reliability of the wastewater treatment process at the WPCP and would continue to comply with the water quality requirements in the NPDES Permit, which would be reissued or modified to reflect the changes in the treatment processes. The NPDES Permit incorporates the water quality objectives from the Basin Plan that are protective and the beneficial uses of the receiving waters and the receiving water quality and the effluent resulting from the wastewater treatment at the WPCP would be subject to and required to comply with the NPDES permit.

Groundwater

As discussed in PEIR Impact HYD-4 (beginning on PEIR page 4.9-36), shallow groundwater beneath the landfill is influenced by surface water ponds, channels, ditches, storm drain pipelines, and sanitary sewers, which result in a generally radial flow of groundwater toward the center of the landfill (San Francisco Bay Regional Water Quality Control Board [RWQCB], 2004). An aquitard separates the shallow aquifer from the deeper aquifer and prevents leachate and groundwater impacted by landfill waste from moving downward (RWQCB, 2004). A Corrective Action Program (CAP) is in place to monitor and control the flow of leachate and impacted groundwater from the landfill (Order No. R2-2004-0030). The CAP is based on the hydraulic capture of groundwater by flow toward existing groundwater sinks (areas of relatively low groundwater pressure, toward which groundwater will preferentially flow), primarily stormwater and sanitary sewer pipelines that discharge to the headworks of the main plant site. Project construction activities, such as excavation and associated dewatering, and construction of a floodwall designed to protect the WPCP from rising sea levels, may affect these general groundwater flow patterns and may require the relocation of the monitoring components of the existing CAP. In addition, the depth of the floodwall may alter patterns of groundwater flow between the landfill and the main plant site. Sanitary sewers along Borregas Avenue and Carl Road, and within the main plant site, capture impacted groundwater and leachate under the existing CAP. The City would prepare a technical report describing components of the construction, any modeling done in efforts to predict potential changes to groundwater flow patterns, and design changes deemed necessary to maintain the integrity of the landfill CAP. The project report would be submitted to the RWQCB and project work would not proceed until the RWQCB concurs with the findings and the proposed methods to prevent a negative impact on the efficacy of the CAP. Compliance with these requirements would limit impacts related to changes in groundwater flow patterns to less-than-significant levels.

Flooding

As discussed in PEIR Impact HYD-2, to address flooding at the WPCP, Master Plan improvements include establishment of a floodwall around the main plant site to protect it from tidal flooding. Segments of the floodwall are being constructed in stages along with the individual Master Plan projects at the main plant site. The project would construct one segment of this floodwall, to an elevation of 14 feet. A floodwall of this elevation would meet the protection criteria established by Santa Clara County⁵ (as noted in the PEIR, the base flood elevation at the WPCP mapped by FEMA is 11 feet), and once connected with the other segments of the floodwall would maintain WPCP operations under the predicted 100-year tidal flood event with sea level rise up to 50 years into the future, which is predicted at 12.24 feet (Carollo/HDR, 2013).

Conclusion

The project would improve effluent quality and continue to comply with existing waste discharge requirements applicable to the WPCP, and would not otherwise degrade water quality. (Same Impact as Previously Approved Project [Less than Significant Impact])

The project would construct a portion of a floodwall around the WPCP to elevation 14 feet, which would not result in new or more significant impacts related to impedance or redirection of flood flows. (Same Impact as Previously Approved Project [Less than Significant Impact])

⁵ On April 18 2009, the Santa Clara County Floodplain Ordinance was revised to require flood protection to a level two feet above the Base Flood Elevation, which is one foot higher than previous requirements.

Aesthetics

Issi	es (and Supporting Information Sources):	New Potentially Significant Impact	New Less Than Significant with Mitigation Incorporated	New Less Than Significant Impact	Same Impact as Approved Project	Less Impact than Approved Project
1.	AESTHETICS — Would the project:					
a)	Have a substantial adverse effect on a scenic vista?				\boxtimes	
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				\boxtimes	
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?				\boxtimes	
d)	Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?				\boxtimes	

Setting

The environmental setting relevant to Aesthetics for the project site has not changed since adoption of the PEIR. Setting discussions from the adopted PEIR for scenic vistas, scenic resources, existing visual character or quality, and light and glare are applicable to the project.

Findings of Previously Adopted PEIR

The adopted PEIR found that Master Plan components outside the main plant site (in Ponds 1 and 2) would alter the visual quality of Moffett Channel and Cargill Channel, a significant impact that could be reduced with mitigation. The Secondary Treatment and Dewatering project would not construct facilities outside of the main plant site, and would not affect the high quality views near Ponds 1 and 2 identified in the PEIR.

The adopted PEIR determined that within the main plant the Thickening and Dewatering Building would exceed the current heights of existing structures, and that landscaping planted along the fenceline would partially screen views of these structures from Borregas Avenue and Carl Road. In addition, the PEIR found that these new facilities would be consistent with the existing industrial nature of the main plant site and these facilities would not be visible to motorists on nearby Caribbean Drive due to the intervening landfill topography.

The adopted PEIR found that given (a) the limited publicly accessible viewpoints of the main plant, (b) the existing visual character of the site (see PEIR Figure 4.15-7, Photo 12), and (c) the anticipated future appearance of proposed facilities, implementation of the Master Plan would not substantially degrade the visual character of the main plant.

Discussion

Scenic Vistas, Resources, and Highways

There are no state- or locally-designated scenic vistas in the vicinity of the WPCP, nor is the project site visible from a state scenic highway (Caltrans, 2018; City of Sunnyvale, 2011). Given the absence of designated scenic vistas in the area, construction and operation of the project with modifications would not result in a substantial adverse effect on a scenic vista, highway, or other scenic resource, and no mitigation is required.

Visual Character

The WPCP has an industrial character. The Thickening and Dewatering Building would be approximately 55 feet tall, instead of 50 feet as evaluated in the PEIR. While the Thickening and Dewatering Building would be the tallest building included in the project and would exceed the height of existing structures at the site (the tallest structure at the WPCP main plant is approximately 31 feet tall, excluding appurtenant features), the facility along with the other project facilities would be consistent with the existing industrial character of the WPCP main plant site and would not be visible to motorists on nearby Caribbean Drive due to the intervening landfill topography. The increased height of the Thickening and Dewatering Building would thus not substantially degrade the existing visual character of the site and surroundings, and the impact would not be more significant than that identified in the previously approved PEIR.

Light and Glare

The project would install the same lighting as described in the PEIR; thus, the impact would be the same as that identified in the previously approved PEIR.

Conclusion

No new or more significant impacts related to a scenic vista, highway, or other scenic resource would result from the project with modifications compared to the impacts identified in the previously adopted PEIR. (Same Impact as Previously Approved Project [Less than Significant Impact])

The project with modifications would not result in additional new or more significant impacts related to the visual character of the project site and its surroundings than those identified in the previously adopted PEIR. (Same Impact as Previously Approved Project [Less than Significant Impact])

The project with modifications would not result in new or more significant impacts related to the effects of light and glare on daytime or nighttime views than those identified in the previously adopted PEIR. (Same Impact as Previously Approved Project [Less than Significant Impact])

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- The Climate Registry, 2017b. Table 13.4 Default CH₄ and N₂O Emission Factors for Highway Vehicles by Technology Type. Available: http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission-Factors.pdf.

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CHAPTER 4 Conclusion

The modifications to the Secondary Treatment and Dewatering Facilities Project would result in impacts similar to, or less than, those attributable to the project described in the Sunnyvale Water Pollution Control Plant (WPCP) Master Plan Program Environmental Impact Report (PEIR).

The analyses and discussion in Chapter 3 do not reflect involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects. There have been no changes in circumstances under which the project is undertaken that would result in new significant environmental impacts or substantially more severe impacts, and no new information has become available that would indicate the potential for new significant impacts or substantially more severe impacts than were discussed in the PEIR. Therefore, no further evaluation is required, and no Subsequent EIR is needed pursuant to CEQA Guidelines Section 15162.

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CHAPTER 5

Mitigation Monitoring and Reporting Program – Secondary Treatment and Dewatering Facilities

Table 5-1 presents mitigation measures and City actions to implement, monitor and report on these measures that apply to the Secondary Treatment and Dewatering Facilities project. These measures were adopted by the City Council on August 23, 2016. **Table 5-2** presents other mitigation measures contained within the Sunnyvale Water Pollution Control Plant Master Plan Mitigation Monitoring and Reporting Program that do not apply to the project, and the reasons that they do not apply.

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TABLE 5-1 MITIGATION MONITORING PROGRAM – SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT

Miti	igation Measures Adopted as Conditions of Approval	Implementation Procedures	Monitoring Responsibility	Monitoring and Reporting Action	Monitoring Schedule	Verification of Compliance											
Tra	nsportation																
Miti	gation Measure TR-1a: Truck Route Plan.	Contractor(s) shall obtain approval	City of Sunnyvale Public Works	Verify, review and approve truck	Prior to construction	Verified by:											
As p revie	part of pre-construction submittals, the contractor(s) shall submit a truck route plan to the City of Sunnyvale Public Works Department for ew and approval to help minimize impacts to adjacent roadways.	of truck route plan and implement plan during construction	Department	route plan.		Date:											
Miti	gation Measure TR-1b: Implement a Temporary Traffic Control Plan.	Contractor(s) shall prepare plan	City of Sunnyvale Public Works	Verify inclusion of plan in contract	Prior to construction	Verified by:											
The on the resp Tran Con	City contractor(s) shall prepare and implement a traffic control plan using the City's Temporary Traffic Control guidelines to reduce traffic impacts he roadways at and near the work site, as well as to reduce potential traffic safety hazards and ensure adequate access for emergency bonders. The City shall coordinate development and implementation of this plan with City departments (e.g., Emergency Services, Fire, Police, hsportation), as appropriate. To the extent applicable, the traffic control plan shall conform to the Caltrans' <i>California Manual on Uniform Traffic trol Devices</i> , Part 6 (Temporary Traffic Control; Caltrans, 2014). The traffic control plan shall include, but not be limited to, the following elements:	that adheres to all measures listed Contractor(s) shall implement plan	Department	specifications		Date:											
•	Circulation and detour plans to minimize impacts on local road circulation during road and lane closures. Flaggers and/or signage shall be used to guide vehicles through and/or around the construction zone.																
•	Controlling and monitoring construction vehicle movement through the enforcement of standard construction specifications by onsite inspectors.																
•	Sufficient staging areas for trucks accessing construction zones to minimize disruption of access to adjacent public rights-of-way.																
•	Scheduling truck trips outside the peak morning and evening commute hours to the extent possible.																
•	Maintaining pedestrian and bicycle access and circulation during project construction where safe to do so. If construction activities encroach on bicycle routes or multi-use paths, advance warning signs (e.g., "Bicyclists Allowed Use of Full Lane" and/or "Share the Road") shall be posted that indicate the presence of such users.																
•	Identifying detours for bicycles and pedestrians, where applicable, in all areas affected by project construction.	e 5,															
•	Implementing roadside safety protocols. Advance "Road Work Ahead" warning and speed control signs (including those informing drivers of State legislated double fines for speed infractions in a construction zone) shall be posted to reduce speeds and provide safe traffic flow through the work zone.																
•	Coordinating construction with administrators of police and fire stations (including all fire protection agencies), and recreational facility managers. Operators shall be notified in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures, where applicable.																
•	Storing all equipment and materials in designated contractor staging areas on or adjacent to the worksite, such that traffic obstruction is minimized.																
Miti	gation Measure C-TR-1: Implement Coordinated Transportation Management Plan.	City's contractor(s) shall develop a	City of Sunnyvale Public Works	Verify inclusion of this plan in the	Prior to construction	Verified by:											
Prio cont Trar Mas Mas	r to construction, the City's respective contractor(s) shall develop a Coordinated Transportation Management Plan, and the City and its tractor(s) shall work with other projects' contractors and appropriate County and/or City departments (e.g., Emergency Services, Fire, Police, nsportation) as needed to prepare and implement a transportation management plan for roadways adjacent to and directly affected by the ster Plan improvements or the WPF, and to address the transportation impact of the overlapping construction projects within the vicinity of the ster Plan or the WPF in the region. The transportation management plan shall include, but not be limited to, the following requirements:	The City and its contractor(s) shall develop a plan that adheres to all measures listed. The City and its contractor(s) shall work with other project contractors, if necessary, and	an that adheres to all measures ted. Department Department Department	contract specifications.		Date:											
•	Coordination of individual traffic control plans for the Master Plan or WPF with nearby projects.	appropriate County and/or City															
•	Coordination between the contractor and other project contractors in developing circulation and detour plans that include safety features (e.g., signage and flaggers). The circulation and detour plans shall address:	implementation of this plan.															
	 Full and partial roadways closures 																
	 Circulation and detour plans to include the use of signage and flagging to guide vehicles through and/or around the construction zone, as well as any temporary traffic control devices 																
	 Bicycle/Pedestrian detour plans, where applicable 																
	 Parking along public roadways 																
	- Haul routes for construction trucks and staging areas for instances when multiple trucks arrive at the work sites																
	 Protocols for updating the transportation management plan to account for delays or changes in the schedules of individual projects. 																

 Table 5-1 (Continued)

 MITIGATION MONITORING PROGRAM – SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT

Mitigation Measures Adopted as Conditions of Approval	Implementation Procedures	Monitoring Responsibility	Monitoring and Reporting Actic
Air Quality			
Mitigation Measure AQ-2a: Implement BAAQMD Basic Construction Mitigation Measures.	City or its contractor(s) implement	City of Sunnyvale Public Works	Verify inclusion of measu
The City shall implement the following applicable BAAQMD Basic Construction Mitigation Measures to reduce emissions of fugitive dust and equipment exhaust:	BAAQMD Basic Construction Measures	Department	contract specifications an construction plans.
• All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.			Inspect construction site
 All haul trucks transporting soil, sand, or other loose material offsite shall be covered. 			confirm compliance by th
• 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.			contractor, report non- compliance and ensure
 All vehicle speeds on unpaved roads shall be limited to 15 mph. 			corrective action.
 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. 			
 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. 			
 All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator. 			
• Post a publicly visible sign with the telephone number and person to contact at the City or City's contractor regarding dust complaints. This person shall respond and the contractor shall take corrective action within 48 hours.			
Mitigation Measure AQ-2b: Implement BAAQMD Additional Construction Mitigation Measures.	City or its contractor(s) implement	City of Sunnyvale Public Works	Verify inclusion of measu
The City shall implement the following applicable BAAQMD Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Thresholds to further reduce emissions of fugitive dust and exhaust:	BAAQMD additional measures	Department	contract specifications an construction plans.
All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified builds complex or maintain problem.			Inspect construction site t confirm compliance by the
 All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. 			contractor, report non-cor
• Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have			and ensure corrective act
at maximum 50 percent air porosity.			
 Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. 			
The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be			
limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.			
 All trucks and equipment, including their tires, shall be washed off prior to leaving the site. Site appearance to a distance of 100 feet from the payod read shall be tragted with a 6 to 12 inch compared layer of wood ships, multiple or group. 			
 Site accesses to a distance of 100 reet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, much, or gravel. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one 			
percent.			
 Minimizing the idling time of diesel powered construction equipment to two minutes. 			
 The City shall develop a plan demonstrating that the on-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NOx reduction compared to the most recent 			
CARB fleet average. Acceptable options for reducing emissions include the use of newer model engines, low-emission diesel products,			
alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such			
become available.			
 All construction equipment, diesel trucks, and generators must be equipped with Best Available Control Technology for emission reductions of NOx and PM 			
All contractors must use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.			
Biological Resources			
Mitigation Measure BIO-1a: Reduce Impacts on Congdon's Tarplant.	Contractor(s) shall prepare	City of Suppyvale Public Works	Review qualifications of
	construction plans that incorporate	Department	Contractor-nominated bio
• Within 2 years prior to initial ground disturbance for activities outside the main plant fenceline, the City will retain a qualified biologist, or require the	protocol-level pre-construction		and either approve or rec
contractor to retain a qualified biologist, to conduct protocol-level surveys for Congdon's tarplant in suitable habitat in, and within 50 feet of, the proposed construction footprint. These surveys will be conducted in accordance with the protocols established by the CDEW and CNPS, and shall	surveys for Congdon's tarplant.		identification of additional
coincide with the bloom period for the species (May through November).			
	The Contractor shall identify a		
• If Congdon's tarplant is present in the survey area, the City contractor will avoid impacts on individuals of this species to the extent feasible during	quaimed biologist.		Review pre-construction
implementation of the Master Plan.			reports for recommended

nd tion	Monitoring Schedule	Verification of Compliance
sures in and	Prior to construction	Verified by: Date:
te to the	During construction	
e		
·	Diante a contraction	Marthauthur
and	Prior to construction	Date:
e to the compliance action.	During construction	
f biologist ecommend al	Prior to commencement of construction.	Verified by: Date:
n survey ed	After completion of pre- construction survey report.	

TABLE 5-1 (CONTINUED) MITIGATION MONITORING PROGRAM – SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT

Mitigation Measures Adopted as Conditions of Approval	Implementation Procedures	Monitoring Responsibility	Monitoring and Reporting Action	Monitoring Schedule	Verification of Compliance
 If Congdon's tarplant is present near the limits of disturbance, the City contractor will maintain a buffer free from construction-related activities around the tarplant occurrence; this buffer will be at least 50 feet if feasible, but large enough to avoid indirect impacts such as dust mobilization and alteration of hydrology. The City contractor shall demarcate the buffer in the field with orange fencing. No equipment or vehicles shall be permitted within the buffer area during construction. 	Qualified biologist will conduct pre-construction surveys.		avoidance, buffer, and/or need for compensatory mitigation.		
 If 15 percent or more of the known population of Congdon's tarplant within five miles of the Master Plan area at the time of impact would be affected by the Master Plan, the City will provide compensatory mitigation. To compensate for loss of individual Congdon's tarplants, offsite habitat either occupied by the species or suitable for restoration to support the species and revegetated with this species (such as Sunnyvale Baylands Park) shall be preserved and managed in perpetuity at a minimum 1:1 mitigation ratio (at least one plant preserved for each plant affected). Seeds from the affected population shall be collected and used to seed the mitigation area. 	Qualified biologist to inspect construction site to confirm implementation of measures.		Inspect and confirm implementation of construction buffer zone(s) based on pre- construction survey results.	One inspection shall occur during each phase of construction.	
	Locate compensatory mitigation site, as needed, and select qualified biologist to collect and disseminate seeds from affected population during appropriate season (generally September/ October)		Review pre-construction survey reports for recommended avoidance, buffer, and/or need for compensatory mitigation.	After completion of pre- construction survey report.	
	Qualified biologist shall collect and disseminate seeds from affected population during appropriate season		Secure record of planting from qualified biologist	After completion of planting.	
Mitigation Measure BIO-1b: Prevent the Introduction and Spread of Non-native, Invasive Species.	City or contractor shall retain	City of Sunnyvale Public Works	Review qualifications of	Prior to construction	Verified by:
• The City will retain a qualified biologist, or require the contractor to retain a qualified biologist, to develop an Invasive Species Management Plan to reduce the presence and spread of non-native, invasive plant species in the Master Plan area. The Invasive Species Management Plan shall be developed prior to any grading or import of fill material outside of, or within 20 feet of the western and northern sections of the main plant fenceline. Once a concrete flood wall is built around the facility, no invasive species management will be necessary for project activities within the main plant fenceline. The overarching goal of this mitigation is to halt the further expansion of existing invasive species and introduction of new invasives into sensitive habitats in project areas. The Invasive Species Management Plan shall include, but not be limited to, the following:	qualified biologist Qualified biologist will develop	Department	Contractor-nominated biologist and either approve or recommend identification of additional candidates. Verify inclusion of the Plan in		Date:
 Prior to construction outside of, or within 20 feet of the western and northern sections of, the main plant fenceline, the extent and locations of invasive species occurrences will be mapped within all areas proposed to be graded, including access roads and staging areas, and within all sensitive habitats (e.g., wetlands) across the project areas. 	Plan City or Contractor to implement		Review annual monitoring report	During construction	
 Areas identified to have weed infestations shall be treated prior to ground disturbance according to weed control methods detailed below: Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods approved for application. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the City of Sunnyvale, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. Where manual and/or mechanical methods are used, disposal of the plant debris will take place at an appropriate offsite location. The timing of the weed control treatment shall be determined for each plant species with the goal of controlling populations before they start producing seeds and/or encroach into adjacent areas from rhizomatous shoots. Consultation with a qualified wildlife biologist and plant ecologist shall be required prior to weed control treatments in sensitive habitats with the intent of avoiding any adverse impacts on special-status species in the area. 	Plan prior to and during construction		for compliance with measure		
 Surveying and monitoring for weed intestations shall occur over the course of any grading operations outside of, or within 20 feet of the western and northern sections of, the main plant fenceline. Treatment of all identified weed populations shall occur at a minimum of once annually. 					
 Once grading ceases, invasive plant populations within all sensitive habitats (such as wetlands) that are not impacted, but that are within 200 feet of grading/construction areas located outside of or within 20 feet of the western and northern sections of the main plant fenceline, shall be mapped and the areal extent and location of invasive populations documented. Sensitive habitats include portions of the Sunnyvale West Channel, the Cargill Channel, Ponds 1 and 2, and SCVWD Pond A4. This shall occur on an annual basis for a minimum of 3 years following grading operations. 					
 If, in any monitoring year, the size of existing populations within sensitive habitats expands by 20 percent or more in terms of surface area in comparison to the population size documented prior to construction, the weed control measures described above shall be implemented (inter-annual variation due to climate differences may account for as much as 10 percent of change). 					
 During construction activities located outside of or within 20 feet of the western and northern sections of the main plant fenceline, all seeds and straw materials used on site shall be weed-free rice straw, and all gravel and fill material shall be certified weed free. 					
During construction activities located outside of or within 20 feet of the western and northern sections of the main plant fenceline, vehicles and all equipment shall be washed (including wheels, undercarriages, and bumpers) before entering the project areas adequately to ensure that weed seeds from other sites are not transported to these construction areas. Vehicles shall be cleaned at existing construction yards or legally operating car washes. In addition, tools such as chainsaws, hand clippers, pruners, etc., shall be washed before entering the work areas.					

 TABLE 5-1 (CONTINUED)

 MITIGATION MONITORING PROGRAM – SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT

Mitigation Measures Adopted as Conditions of Approval	Implementation Procedures	Monitoring Responsibility	Monitoring and Reporting Action	Monitoring Schedule	Verification of Compliance
Mitigation Measure BIO-2a: Worker Environmental Awareness Training. The City will retain, or require the contractor to retain, a qualified biologist to conduct mandatory contractor/worker environmental awareness training for all construction personnel working on project activities outside of the main plant, including but not limited to Ponds 1 and 2, the diurnal equalization and emergency storage basins, channel levees, and the Bay Trail parking relocation area. The awareness training will be provided to all construction personnel to brief them on the potential for special-status species to occur on the site, the need to avoid effects to special-status species and their habitats, and all project mitigation measures pertaining to biological resources and water quality. If new construction personnel are added, the contractor will ensure that the personnel receive the mandatory training before starting work. A representative will be appointed during the employee education program to be the contact for any employee or contractor who might inadvertently kill or injure a special-status species or who finds a dead, injured, or entrapped individual. The representative's name and telephone number will be provided to the City prior to the initiation of construction activities outside of the main plant.	City or contractor(s) to retain a qualified biologist to conduct environmental awareness training for construction personnel. Qualified biologist to conduct training(s)	City of Sunnyvale Public Works Department	Review qualifications of Contractor-nominated biologist and either approve or recommend identification of additional candidates. Verify inclusion of the Plan in contract specifications. Record name of appointed representative to contact Record date(s) of training	Prior to construction outside of the main plant	Verified by: Date:

TABLE 5-1 (CONTINUED) MITIGATION MONITORING PROGRAM – SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT

Mitigation Measures Adopted as Conditions of Approval	Implementation Procedures	Monitoring Responsibility	Monitoring and Reporting Action	Monitoring Schedule	Verification of Compliance
 Mitigation Measure BIO-2e: Burrowing Owl Measures. The following measures will be implemented to avoid and minimize impacts on burrowing owls in the Master Plan area, particularly on the closed landfill and along the Sunnyvale West Channel but also including areas within the main plant fenceline that may support ground squirrel burrows: Preconstruction surveys for burrowing owls will be conducted by a qualified biologist prior to all construction activities that occur within 250 feet of potential burrowing owl habitat on the closed landfill or along the Sunnyvale West Channel, in conformance with CDFW protocols. This measure applies to construction activities inside of the main plant fenceline only where ground squirrel burrows are present or for those activities located within 250 feet of suitable burrowing owl habitat on the closed landfill or Sunnyvale West Channel. The final survey will occur no more than 2 days prior to the start of any ground-disturbing activity such as clearing and grubbing, excavation, or grading, or any similar activity within 250 feet of suitable habitat that could disturb nesting owls. If no burrowing owls are located on or immediately adjacent to impact areas, the following measures would be implemented. If burrowing owls are present during the nonbreeding season (generally 1 September to 31 January), the City/contractor would maintain a 150-foot buffer within which no new Master Plan-related activity would occur, around the occupied burrow(s) if feasible. However, this buffer distance would not apply to existing operations and maintenance activities in the main plant. A reduced buffer distance is acceptable during the nonbreeding season (generally 1 September to 31 January), the City/contractor would maintained between Master Plan activities and occupied burrows. Owls present at burrow(s) used by the owls. During the breeding season (generally 1 February to 31 August), a 250-foot buffer, within which no new Master Plan-related activity would be a	Contractor to prepare plans that incorporate preconstruction surveys, buffer zones, and relocation plan Contractor to identify qualified biologist to conduct preconstruction surveys Qualified biologist to establish buffer zones or conduct owl relocation, as needed	City of Sunnyvale Public Works Department	Review qualifications of Contractor-nominated biologist and either approve or recommend identification of additional candidates. Verify inclusion of these measures in contract specifications and construction plans Review survey report If burrowing owls present, inspect construction site to confirm buffer zones	Prior to construction During construction	Verified by: Date:
 Mitigation Measure BIO-2h: Nesting Bird Measures. The following measures will be implemented throughout the Master Plan area to minimize impacts on nesting San Francisco common yellowthroat. Alameda song sparrow, and other native bird species: Nesting deterrence can be implemented to minimize the potential for nesting birds to constrain project activities or to be adversely affected by those activities. The most effective nesting deterrence in non-developed potitons of the main plant is vegetation removal to remove nesting substrate. Vegetation that is to be affected by the project should be removed during the nonbreeding season (i.e., September 1 through January 31) if feasible. If necessary, removal of nest-starts (incomplete nests that do not yet contain eggs or young) by qualified biologists may occur during the breeding season. Such nest-start removal may begin early in the breeding season (i.e., September 1 through January 31) if feasible. If necessary, removal and construction commences. Some species, such as barn swallows or black phoebes, may establish nests on buildings or other structures. To deter birds from nesting or other deterrence devices may be installed to prevent death or injury of birds as a result of improperly installed deterrence devices, and such devices will require regular maintenance to ensure that they are functioning properly. Prior to commencement of new activities (i.e., activities that are not currently ongoing in any given area) during the breeding season (February 1 through August 31), preconstructing nucreys will be conducted by a qualified biologist will inspect all potential nesting habitats (e.g., trees, shrubs, buildings, and various substrates on the ground) in the project area for nest. This survey will include suitable nesting substrates both within and outside the main plant fenceline. Surveys will be conducted within search radii corresponding to disturbance-free buffer zones described below for raptors	Contractor(s) to prepare construction plans that include schedule of vegetation removal, nest deterrence, preconstruction surveys, and buffer zones Contractor to identify qualified biologist to conduct nesting deterrence measures Contractor to remove vegetation within non-breeding season Biologist to implement nesting deterrence measures	City of Sunnyvale Public Works Department	Review qualifications of Contractor-nominated biologist and either approve or recommend identification of additional candidates. Verify inclusion of measures in contract specifications and construction plans	Prior to construction	Verified by: Date:

 TABLE 5-1 (CONTINUED)

 MITIGATION MONITORING PROGRAM – SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT

	Implementation		Monitoring and	Monitoring	
Mitigation Measures Adopted as Conditions of Approval	Procedures	Monitoring Responsibility	Reporting Action	Schedule	Verification of Compliance
 A qualified biologist will monitor activity at each nest for 8 hours on the first day that construction occurs within the standard buffer (e.g., within 100 feet of a non-raptor nest). If the biologist determines that the birds' behavior is not adversely affected, Master Plan activities may continue. The biologist should continue to monitor the nests for 1 hour/day on any day when construction activities occur within the standard buffer around an active nest. 					
 If at any time the biologist determines that Master Plan activities within the standard buffer is adversely affecting the behavior of the birds such that the nest is in jeopardy of failing, construction activities should retreat to honor the standard buffer until the nest is no longer active (i.e., the young have fledged). 					
Mitigation Measure BIO-4a: Avoidance and Preservation of Trees.	Department of Community	City of Sunnyvale Public Works	Review qualifications of	Prior to construction within	Verified by:
 During detailed design of Master Plan activities, either within or outside the main plant fenceline, ordinance-sized trees will be avoided to the extent feasible. If it is determined during detailed design 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 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 dewatering operations through use of the following measures during excavation: Do not trench inside tree protection zones. Hand excavate under or around tree roots to a depth of 3 feet. Do not cut main lateral tree roots or taproots. Protect exposed roots from drying out before placing permanent backfill.<td>Development to determine whether ordinance applies to trees in the Master Plan area Contractor(s) to prepare construction plans maximizing avoidance of trees City or contractor to retain a qualified arborist to prepare Tree Preservation Plan Contractor(s) to implement Tree Preservation Plan measures</td><td>Department</td><td>Contractor-nominated arborist and either approve or recommend identification of additional candidates. Verify inclusion of the Plan measures in construction plans</td><td>Master Plan area</td><td>Date:</td>	Development to determine whether ordinance applies to trees in the Master Plan area Contractor(s) to prepare construction plans maximizing avoidance of trees City or contractor to retain a qualified arborist to prepare Tree Preservation Plan Contractor(s) to implement Tree Preservation Plan measures	Department	Contractor-nominated arborist and either approve or recommend identification of additional candidates. Verify inclusion of the Plan measures in construction plans	Master Plan area	Date:
Provide temporary impation to all trees in protection zones that may have important root systems impacted by construction.	Contractor or City to identify trees	City of Supply ale Public Works	Review qualifications of	Prior to construction that would	
At the discretion of the Director of Community Development, the City will either replace any removed protected trees at a 1:1 ratio or pay an in-lieu fee into a fund.	to be removed Qualified arborist to identify "protected" trees to be removed City to replace protected trees or pay in-lieu fee	Department	Contractor-nominated arborist and either approve or recommend identification of additional candidates Confirm planting of replacement trees or payment of in-lieu fee	remove trees	
Hazards and Hazardous Materials					
Mitigation Measure HAZ-2a: Hazardous Building Materials Abatement. The City shall ensure that, prior to demolition, the building is surveyed for hazardous building materials including, electrical equipment containing polychlorinated biphenyl (PCBs), fluorescent light ballasts containing PCBs or bis(2-ethylhexyl) phthalate (DEHP), and fluorescent light tubes	City or contractor(s) to conduct survey for hazardous building materials	City of Sunnyvale Public Works Department	Verify inclusion of requirements in contract specifications Review survey results	Prior to demolition	
that are proposed to be removed during renovation shall be evaluated for the presence of PCBs and in the case where the presence of PCBs in the light ballast cannot be verified, they shall be assumed to contain PCBs, and handled and disposed of as such, according to applicable laws and regulations. Any other hazardous building materials identified either before or during demolition or renovation shall be abated according to federal, state, and local laws and regulations.	properly dispose of materials as described		Confirm handling and disposal performed in compliance with laws and regulations	During demolition	

TABLE 5-1 (CONTINUED) MITIGATION MONITORING PROGRAM – SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT

Implementation Procedures	Monitoring Responsibility	Monitoring and Reporting Action	Monitoring Schedule	Verification of Compliance
Contractor(s) to prepare Health and Safety Plan and incorporate Plan in construction plans Contractor(s) to implement Plan	City of Sunnyvale Public Works Department	Review each Health and Safety Plan Verify inclusion of Plan in contract specifications for each individual construction contract	Prior to ground disturbance	
Contractor to prepare Soil and	City of Sunnyvale Public Works	Review Soil and Groundwater	Prior to ground disturbance	
Groundwater Management Plan Contractor to implement Plan	Department	Management Plan Verify inclusion of Plan in contract specifications		
City or Contractor to retain cultural resources expert to conduct preconstruction worker environmental awareness training on recognition of archaeological resources Contractor to notify City of Sunnyvale if resources	City of Sunnyvale Public Works Department	Verify inclusion of requirements in contract specifications	Prior to ground disturbance	Verified by: Date:
S7 / 5	Implementation Procedures Contractor(s) to prepare Health and Safety Plan and incorporate Plan in construction plans Contractor(s) to implement Plan Contractor to prepare Soil and Groundwater Management Plan Contractor to implement Plan Contractor to implement Plan Contractor to implement Plan Contractor to retain Cultural resources expert to conduct preconstruction worker environmental awareness training on recognition of archaeological resources Contractor to notify City of Sunnyvale if resources encountered	Implementation ProceduresMonitoring ResponsibilityContractor(s) to prepare Health and Safety Plan and incorporate Plan in construction plans Contractor(s) to implement PlanCity of Sunnyvale Public Works DepartmentContractor(s) to implement PlanCity of Sunnyvale Public Works DepartmentCity of Sunnyvale Public Works DepartmentContractor to prepare Soil and Groundwater Management Plan Contractor to implement PlanCity of Sunnyvale Public Works DepartmentContractor to implement Plan Contractor to retain cultural resources expert to conduct preconstruction worker environmental awareness training on recognition of archaeological resources Contractor to notify City of Sunnyvale if resources encounteredCity of Sunnyvale Public Works Department	Implementation Procedures Monitoring Responsibility Monitoring and Reporting Action Contractor(s) to prepare Health and Safety Plan and incorporate Plan in construction plans City of Sunnyvale Public Works Review each Health and Safety Plan Contractor(s) to implement Plan City of Sunnyvale Public Works Review Soil and Groundwater individual construction contract Contractor to prepare Soil and Groundwater Management Plan City of Sunnyvale Public Works Review Soil and Groundwater Management Plan Contractor to implement Plan City of Sunnyvale Public Works Review Soil and Groundwater Management Plan Contractor to implement Plan City of Sunnyvale Public Works Review Soil and Groundwater Management Plan Contractor to implement Plan City of Sunnyvale Public Works Review Soil and Groundwater Management Plan Contractor to retain cultural resources expert to conduct preconstruction worker environmental awareness training on recognition of archaeological resources City of Sunnyvale Public Works Verify inclusion of requirements in contract specifications City of Contractor to retain cultural resources expert to conduct preconstruction worker environmental awareness training on recognition of archaeological resources City of Sunnyvale Public Works Verify inclusion of requirements in contract specifications	Implementation ProceduresMonitoring ResponsibilityMonitoring and Reporting ActionMonitoring ScheduleContractor(s) to prepare Health and Safety Plan and incorporate Plan in construction plansCity of Sunnyvale Public Works DepartmentReview each Health and Safety PlanPrior to ground disturbanceContractor(s) to implement PlanCity of Sunnyvale Public Works DepartmentReview each Health and Safety PlanPrior to ground disturbanceContractor(s) to implement PlanCity of Sunnyvale Public Works DepartmentReview Soil and Groundwater Management Plan Contractor to prepare Soil and Groundwater Management Plan Contractor to implement PlanCity of Sunnyvale Public Works DepartmentReview Soil and Groundwater Management Plan Verify inclusion of Plan in contract specificationsPrior to ground disturbanceCity or Contractor to retain cultural resources expert to conduct preconstruction worker environmental awareness training on recognition of archeeological resources encounteredCity of Sunnyvale Public Works DepartmentVerify inclusion of requirements in contract specificationsPrior to ground disturbance

If prehistoric or historic-period archaeological resources are encountered, all construction activities within 100 feet will halt and the City of Sunnyvale will be notified. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include deposits of metal, glass, and/or ceramic refuse. A Secretary of the Interior-qualified archaeological resource (as defined pursuant to the CEQA Guidelines), mitigation will be implemented in accordance with PRC Section 21083.2 and Section 15126.4 of the CEQA Guidelines, with a preference for preservation in place. Consistent with Section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement. If avoidance is not feasible, a qualified archaeologist will prepare and implement a detailed treatment plan in consultation with City of Sunnyvale and, for prehistoric resources, the appropriate Native American representative. Treatment of unique archaeological resources will follow the applicable requirements of PRC Section 21083.2. Treatment for most resources would consist of (but would not be not limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the project. The treatment plan will include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemina	conduct preconstruction worker environmental awareness training on recognition of archaeological resources Contractor to notify City of Sunnyvale if resources encountered Secretary of the Interior-qualified archaeologist will inspect the findings within 24 hours of discovery Archaeologist, City, and contractor to implement mitigation as determined by archaeologist		
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 TABLE 5-1 (CONTINUED)

 MITIGATION MONITORING PROGRAM – SECONDARY TREATMENT AND DEWATERING FACILITIES PROJECT

Mitigation Measures Adopted as Conditions of Approval	Implementation Procedures	Monitoring Responsibility	Monitoring an Reporting Action
Mitigation Measure CUL-3: Unanticipated Discovery of Paleontological Resources. If paleontological resources, such as fossilized bone, teeth, shell, tracks, trails, casts, molds, or impressions are discovered during ground- disturbing activities, work will stop in that area and within 100 feet of the find until a qualified paleontologist can assess the nature and importance of the find and, if necessary, develop appropriate treatment measures in conformance with Society of Vertebrate Paleontology standards, and in consultation with the City of Sunnyvale.	City or Contractor to retain cultural resources expert to conduct preconstruction worker environmental awareness training on recognition of archaeological resources Contractor to notify City of Sunnyvale if resources encountered	City of Sunnyvale Public Works Department	Verify inclusion of requir in contract specifications
Mitigation Measure CUL-4: Unanticipated Discovery of Human Remains. In the event of discovery or recognition of any human remains during construction activities, such activities within 100 feet of the find will cease until the Santa Clara County Coroner has been contacted to determine that no investigation of the cause of death is required. The NAHC will be contacted within 24 hours if it is determined that the remains are Native American. The NAHC will then identify the person or persons it believes to be the most likely descendant from the deceased Native American, who in turn would make recommendations to the City of Sunnyvale for the appropriate means of treating the human remains and any grave goods.	Contractor(s) shall monitor worker activities Contractor(s) shall halt work and notify the County Coroner, if necessary. If appropriate, Coroner shall notify NAHC. NAHC shall notify Most Likely Descendant (MLD).	City of Sunnyvale Public Works Department	Verify inclusion of requir in contract specifications

id on	Monitoring Schedule	Verification of Compliance
rements s	Prior to ground disturbance	Verified by: Date:
rements s	Prior to ground disturbance	Verified by: Date:

 TABLE 5-2

 Adopted Mitigation Measures that Do Not Apply to the Project

Adopted Mitigation Measures	Reason Measure Does Not Apply to Secondary Treatment and Dewatering Facilities Project
Mitigation Measure NOI-1: Develop and Implement Construction Noise Logistics Plan.	Does not apply due to construction hours
Mitigation Measure BIO-2b: Minimization of Impacts on Water Quality.	Does not apply because project does not directly drain to Sunnyvale West Channel.
Mitigation Measure BIO-2c: Special-Status Fish Measures.	Does not apply due to location.
Mitigation Measure BIO-2d: Western Pond Turtle Measures.	Does not apply because project is not in or near Sunnyvale West Channel.
Mitigation Measure BIO-2f: California Ridgway's Rail and California Black Rail Measures.	Does not apply due to location.
Mitigation Measure BIO-2g: Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew Measures.	Does not apply due to location.
Mitigation Measure BIO-3a: Avoidance of Open Water and Wetland Habitats.	Does not apply due to location.
Mitigation Measure BIO-3b: Compensatory Mitigation for Aquatic and Wetland Habitats.	Does not apply due to nature of project activities.
Mitigation Measure HYD-2: Hydraulic Analysis of Levee Widening.	Does not apply due to nature of project activities.
Mitigation Measure HYD-3a: Flood Hazard Assessment and Design For Diurnal Equalization Tanks, Pump Station, and Pipeline.	Does not apply due to nature of project activities.
Mitigation Measure HYD-3b: Restoration Plan for Ponds 1 and 2.	Does not apply due to nature of project activities.
Mitigation Measure HYD-3c: Flood Protection Prior to Levee Breaching.	Does not apply due to nature of project activities.
Mitigation Measure WQ-4: Water Quality Evaluation and Control Plan for Oxidation Pond Breaching and Restoration.	Does not apply due to nature of project activities.
Mitigation Measure CUL-1. Assessment of Effects to Cargill Channel.	Does not apply due to nature of project and location.
Mitigation Measure AES-1: Levee Plantings and Visual Screening.	Does not apply due to nature of project and location.
Mitigation Measure GI-1: Update Projections.	Does not apply due to nature of project activities.

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CONSTRUCTION EMISSIONS

CAP Emissions Summary

			Average Dail	y Emissions (lb/day)	
Construction Phase	Number of workdays	ROG	NOx	PM ₁₀	PM _{2.5}
Phase 1: Site Demolition, Site Surcharging & Site Prepa	iration				
Construction Equipment		0.86	8.53	0.42	0.38
Truck Trips	226	0.34	14.86	0.37	0.17
Worker Trips	330	1.09	0.89	0.34	0.14
Total		2.29	24.29	1.13	0.70
Phase 2: Earthwork & Site Work for Structures					
Construction Equipment		1.00	10.00	0.48	0.44
Truck Trips	252	0.43	18.71	0.47	0.22
Worker Trips	232	1.09	0.89	0.34	0.14
Total		2.51	29.61	1.29	0.81
Phase 3: Facility Construction					
Construction Equipment		0.61	6.22	0.28	0.26
Truck Trips	E00	0.15	6.66	0.17	0.08
Worker Trips	388	1.09	0.89	0.34	0.14
Total		1.86	13.78	0.79	0.48
Total Project Average					
Construction Equipment		0.76	7.69	0.36	0.33
Truck Trips	1176	0.27	11.59	0.29	0.13
Worker Trips	11/0	1.09	0.89	0.34	0.14
Total		2.12	20.17	0.99	0.61

GHG Emissions Summary

	GHG Emission	is over Project Construc	tion (tons)	
Source	CO2	CH₄	N ₂ O	CO ₂ e
Phase 1: Site Demolition, Site Surcharging & Site Preparation	201.63	0.01	0.00	203.16
Phase 2: Earthwork & Site Work for Structures	182.07	0.01	0.00	183.45
Phase 3: Facility Construction	212.45	0.01	0.00	214.06
Total from Construction Equipment	596.1	0.031	0.014	600.7
On-road Truck Trips	2299.5	0.007	0.006	2301.4
Worker Commute Trips	1220.4	0.288	0.357	1323.0
TOTAL	4116	0.326	0.377	4225.0

Construction Schedule

Construction Phase	Start Date	End Date	Days/Week	Total Days
Phase 1: Site Demolition, Site Surcharging & Site Preparation	November 2020	October 2021	5	336
Phase 2: Earthwork & Site Work for Structures	January 2021	January 2022	5	252
Phase 3: Facility Construction	January 2022	April 2024	5	588
	TOTAL			1176

Emissions from OFFROAD Construction Equipment

					Phase 1: Sit	te Demolitio	on, Site Sur	charging &	Site Prepar	ation												
Design Construction Equipment	Equivalent Equipment in OFEROAR	Number of	Workdays used in	Workdays used in Assumed Average OFFROAD Emission Factors (lb/hp-hr)			Emissions by Phase (lbs/phase)				GHG Emission Factors					GHG Emissions by Phase (tons/phase)			ase)			
Project Construction Equipment	Equivalent Equipment in OFFROAD	Equipment	Phase	Hours per workday	horsepower (hp)	ROG	NOx	PM ₁₀	PM _{2.5}	ROG	NOx	PM ₁₀	PM _{2.5}	CO ₂ (lb/hp-hr) ¹	CH ₄ (g/gallon) ²	CH ₄ (g/hp-hr) ³	N ₂ O (g/gallon) ²	N ₂ O (g/hp-hr) ³	CO2	CH ₄	N ₂ O	CO ₂ e
Excavator	ConstMin - Excavators	2	53	6	188	0.0002	0.0019	0.0001	0.0001	23.45	230.62	11.21	10.31	0.4447	0.58	0.0115	0.26	0.0051	26.59	0.0014	0.0006	26.79
Dozer/Loader	ConstMin - Rubber Tired Loaders	2	35	6	105	0.0004	0.0037	0.0003	0.0003	19.59	165.31	12.95	11.91	0.4168	0.58	0.0107	0.26	0.0048	16.46	0.0008	0.0004	16.58
Grader	ConstMin - Graders	2	20	6	173	0.0005	0.0049	0.0003	0.0003	20.81	203.11	11.34	10.43	0.4763	0.58	0.0123	0.26	0.0055	10.75	0.0006	0.0002	10.83
Roller	ConstMin - Rollers	2	17	6	95	0.0003	0.0031	0.0002	0.0002	6.06	60.96	3.88	3.57	0.4368	0.58	0.0113	0.26	0.0050	8.38	0.0004	0.0002	8.44
Concrete Truck	ConstMin - Off-Highway Trucks	0	0	6	300	0.0002	0.0021	0.0001	0.0001	0.00	0.00	0.00	0.00	0.4423	0.58	0.0114	0.26	0.0051	0.00	0.0000	0.0000	0.00
Paving Equipment	ConstMin - Paving Equipment	0	0	6	174	0.0002	0.0022	0.0001	0.0001	0.00	0.00	0.00	0.00	0.4125	0.58	0.0106	0.26	0.0048	0.00	0.0000	0.0000	0.00
Crawler Crane/RT Crane	ConstMin - Cranes	1	168	6	350	0.0002	0.0029	0.0001	0.0001	84.07	1008.98	41.25	37.95	0.3352	0.58	0.0086	0.26	0.0039	31.76	0.0016	0.0007	32.00
Pile Drivers	ConstMin - Other Construction Equipment	1	40	6	250	0.0003	0.0036	0.0001	0.0001	17.08	213.72	8.13	7.48	0.4858	0.58	0.0125	0.26	0.0056	10.96	0.0006	0.0003	11.04
Water Truck	ConstMin - Off-Highway Trucks	1	290	8	189	0.0003	0.0022	0.0001	0.0001	116.28	984.95	51.62	47.49	0.4436	0.58	0.0114	0.26	0.0051	96.75	0.0050	0.0022	97.48
Total Emissions during Phase 1										287.35	2867.64	140.38	129.15						201.63	0.01	0.00	203.16
Average Daily Emissions during Phase 1										0.86	8.53	0.42	0.38									

					Phase 2: Ea	arthwork & S	Site Work fo	or Structure	es											
Project Construction Equipment	Eminatent Eminment in OFEROAD	Number of	Workdays used in		Assumed Average	OFFROAD Emission Factors (lb/hp-hr)					Emissions by P	hase (lbs/phase)		GI	IG Emission Facto	ors	GH	G Emissions by Pl	nase (tons/phase)	
Project Construction Equipment	Equivalent Equipment in OFFROAD	Equipment	Phase	Hours per Workday	horsepower (hp)	ROG	NOx	PM ₁₀	PM _{2.5}	ROG	NOx	PM ₁₀	PM _{2.5}	CO ₂ (lb/hp-hr) ¹	CH ₄ (g/hp-hr) ³	N ₂ O (g/hp-hr) ³	CO2	CH ₄	N ₂ O	CO ₂ e
Excavator	ConstMin - Excavators	4	29	6	188	0.0002	0.0019	0.0001	0.0001	25.67	252.37	12.27	11.28	0.44	0.01	0.01	29.09	0.0015	0.0007	29.31
Dozer/Loader	ConstMin - Rubber Tired Loaders	4	22	6	105	0.0004	0.0037	0.0003	0.0003	24.63	207.82	16.27	14.97	0.42	0.01	0.00	20.69	0.0011	0.0005	20.84
Grader	ConstMin - Graders	0	0	6	173	0.0005	0.0049	0.0003	0.0003	0.00	0.00	0.00	0.00	0.48	0.01	0.01	0.00	0.0000	0.0000	0.00
Roller	ConstMin - Rollers	2	3	6	95	0.0003	0.0031	0.0002	0.0002	1.07	10.76	0.68	0.63	0.44	0.01	0.01	1.48	0.0001	0.0000	1.49
Concrete Truck	ConstMin - Off-Highway Trucks	0	0	6	300	0.0002	0.0021	0.0001	0.0001	0.00	0.00	0.00	0.00	0.44	0.01	0.01	0.00	0.0000	0.0000	0.00
Paving Equipment	ConstMin - Paving Equipment	0	0	6	174	0.0002	0.0022	0.0001	0.0001	0.00	0.00	0.00	0.00	0.41	0.01	0.00	0.00	0.0000	0.0000	0.00
Crawler Crane/RT Crane	ConstMin - Cranes	1	126	6	350	0.0002	0.0029	0.0001	0.0001	63.05	756.73	30.94	28.46	0.34	0.01	0.00	23.82	0.0012	0.0006	24.00
Pile Drivers	ConstMin - Other Construction Equipment	1	80	6	250	0.0003	0.0036	0.0001	0.0001	34.16	427.44	16.27	14.97	0.49	0.01	0.01	21.92	0.0011	0.0005	22.09
Water Truck	ConstMin - Off-Highway Trucks	1	255	8	189	0.0003	0.0022	0.0001	0.0001	102.24	866.07	45.39	41.76	0.44	0.01	0.01	85.07	0.0044	0.0020	85.72
Total Emissions during Phase 2										250.82	2521.20	121.82	112.08				182.07	0.01	0.00	183.45
arage Daily Emissions during Phase 2											10.00	0.48	0.44							

					Pha	ase 3: Facili	ty Construe	ction												
Designt Construction Equipment		Number of	Workdays used in	Linua any Mariaday	Assumed Average	0	FFROAD Emissio	on Factors (lb/hp	o-hr)		Emissions by P	hase (lbs/phase)	G	HG Emission Facto	rs	GH	IG Emissions by Pl	nase (tons/phase)	
Project Construction Equipment	Equivalent Equipment in OFFROAD	Equipment	Phase	Hours per workday	horsepower (hp)	ROG	NOx	PM ₁₀	PM _{2.5}	ROG	NOx	PM ₁₀	PM _{2.5}	CO ₂ (lb/hp-hr) ¹	CH ₄ (g/hp-hr) ³	N ₂ O (g/hp-hr) ³	CO2	CH4	N ₂ O	CO ₂ e
Excavator	ConstMin - Excavators	0	0	6	188	0.0002	0.0019	0.0001	0.0001	0.00	0.00	0.00	0.00	0.44	0.01	0.01	0.00	0.0000	0.0000	0.00
Dozer/Loader	ConstMin - Rubber Tired Loaders	1	79	6	105	0.0004	0.0037	0.0003	0.0003	22.11	186.57	14.61	13.44	0.42	0.01	0.00	18.57	0.0010	0.0004	18.71
Grader	ConstMin - Graders	1	6	6	173	0.0005	0.0049	0.0003	0.0003	3.12	30.47	1.70	1.56	0.48	0.01	0.01	1.61	0.0001	0.0000	1.62
Roller	ConstMin - Rollers	1	28	6	95	0.0003	0.0031	0.0002	0.0002	4.99	50.20	3.19	2.94	0.44	0.01	0.01	6.90	0.0004	0.0002	6.95
Concrete Truck	ConstMin - Off-Highway Trucks	2	121	6	300	0.0002	0.0021	0.0001	0.0001	100.66	918.51	35.79	32.92	0.44	0.01	0.01	60.37	0.0031	0.0014	60.82
Paving Equipment	ConstMin - Paving Equipment	1	3	6	174	0.0002	0.0022	0.0001	0.0001	0.68	6.75	0.36	0.33	0.41	0.01	0.00	0.70	0.0000	0.0000	0.70
Crawler Crane/RT Crane	ConstMin - Cranes	3	98	6	350	0.0002	0.0029	0.0001	0.0001	147.12	1765.71	72.19	66.42	0.34	0.01	0.00	55.58	0.0029	0.0013	56.00
Pile Drivers	ConstMin - Other Construction Equipment	0	0	6	250	0.0003	0.0036	0.0001	0.0001	0.00	0.00	0.00	0.00	0.49	0.01	0.01	0.00	0.0000	0.0000	0.00
Water Truck	ConstMin - Off-Highway Trucks	1	206	8	189	0.0003	0.0022	0.0001	0.0001	82.60	699.65	36.67	33.74	0.44	0.01	0.01	68.73	0.0035	0.0016	69.25
Total Emissions during Phase 3										361.28	3657.86	164.52	151.35				212.45	0.01	0.00	214.06
Average Daily Emissions during Phase 3										0.61	6.22	0.28	0.26							
NOTES																				

NOTES: 1. CO₂ emission factor as calculated from OFFROAD2017 - ORION web database available at https://www.arb.ca.gov/orion/ 2. CH₄ and N₂O emission factors as g/gallon from The Climate Registry. Table 13.7 US Default CH4 and N2O Emission Factors for Construction & Mining Equipment, 2017. Available: http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission-Factors.pdf 3. CH₄ and N₂O emission factors converted from g/gallon to g/hp-hr using hp-hr/gal data from OFFROAD2017 - ORION 4. N₂O and CH₄ emissions were multiplied by their respective IPCC AR5 global warming potentials (28 and 265) and added to the CO₂ emissions to obtain carbon dioxide equivalent (CO₂e) emissions.

CAP Emissions from On-road Truck Trips

Construction Phase	Number of Workdows	Ave. Truck Trips/day		One Way Trip length			Emission Fact	ors (gms/mile)		Daily Emissions (lbs/day)				
	Number of Workdays	(round trips)	One way trips/day	(miles)	Truck Trip miles per day	ROG	NOx	PM10	PM _{2.5}	ROG	NOx	PM10	PM _{2.5}	
Phase 1: Site Demolition, Site Surcharging & Site Preparation	336	29	58	25	1450	0.1073	4.1443	0.1168	0.0537	0.34	14.86	0.37	0.17	
Phase 2: Earthwork & Site Work for Structures	252	37	73	25	1825	0.1073	4.1443	0.1168	0.0537	0.43	18.71	0.47	0.22	
Phase 3: Facility Construction	588	13	26	25	650	0.1073	4.1443	0.1168	0.0537	0.15	6.66	0.17	0.08	
Total Project Average Daily	1176									0.27	11.59	0.29	0.13	

CAP Emissions from Worker Commute Trips

	Average Number of workers/day One		One Way Trip		Em	Daily Emissions (lbs/day)						
venicie type		One way mps per bay	length (miles)	miles per day	ROG	NOx	PM10	PM _{2.5}	ROG	NOx	PM ₁₀	PM _{2.5}
LDA	39	78	12.5	975	0.0127	0.0613	0.0465	0.0194	0.15	0.15	0.10	0.04
LDT	91	182	12.5	2275	0.0269	0.1327	0.0472	0.0200	0.94	0.74	0.24	0.10
Average Daily									1.09	0.89	0.34	0.14

GHG Emissions from On-road Truck Trips

Construction Phase	Number of Workdaur	Ave. Truck Trips/day	One way trins / day	One Way Trip length	Truck Trip miles per day	Emis	sion Factors (g/	mile)	Total Emissions (tons/day)			
Phase 1: Site Demolition Site Surcharging & Site Prenaration	Number of Workdays	(round trips)	one way mpsy ady	(miles)		CO ₂	CH4	N ₂ O	CO ₂	CH₄	N ₂ O	CO ₂ e
Phase 1: Site Demolition, Site Surcharging & Site Preparation	336	29	58	25	1450	1636.7213	0.0051	0.0048	2.51	0.000007	0.000007	2.51
Phase 2: Earthwork & Site Work for Structures	252	37	73	25	1825	1636.7213	0.0051	0.0048	3.16	0.000009	0.000009	3.16
Phase 3: Facility Construction	588	13	26	25	650	1636.7213	0.0051	0.0048	1.12	0.000003	0.000003	1.13
Total over Project construction (tons)									2299.48	0.00678	0.00638	2301 36

Copensision factor derived from RMA/2014, CH, and N,O emission factor from Table 13.4, page 36 of the 2017 TCR Default Emission Factors available at http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission-Factors.pdf

GHG Emissions from Worker Commute Trips

Mahida tura	Aurona Number of under day	One Wey Trine and Day	One Way Trip	Worker Commute miles per day	Emission Fa	actors (gms/mile)	Daily Emissions (tons/day)				
venicie type	Average Number of Workers/day	One way mps per bay	length (miles)		CO2	CH₄	N ₂ O	CO2	CH₄	N ₂ O	CO ₂ e	
LDA	39	78	12.5	975	279.2809	0.0704	0.0647	0.28	0.0001	0.0001	0.30	
LDT	91	182	12.5	2275	328.3396	0.0776	0.1056	0.76	0.0002	0.0002	0.83	
Total Daily Emissions (tons/day)								1.04	0.0002	0.0003	1.12	
Total over Project construction (tons)								1220.38	0.29	0.36	1322.98	

CO, emission factor derived from EMFAC2014, CH, and N₂Oemission factor from Table 13.4, page 35 of the 2017 TCR Default Emission Factors available at http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission-Factors.pdf

OPERATIONAL EMISSIONS

CAP Emissions Summary

		Average Daily Emissions (lb/day)										
Source	ROG	NOx	PM ₁₀	PM _{2.5}								
Truck Trips	0.05	2.02	0.05	0.03								
Backup Generator	0.17	3.21	0.04	0.04								
Total	0.22	5.23	0.09	0.07								

CAP Emissions from On-road Truck Trips during Operation

Course	Truck Trips/month	rips/month Ave. Truck		One Way Trin	Truck Trip		Daily Emissions (lbs/day)						
Source	(round trips)	Trips/day (round trips)	trips/day	length (miles)	miles per day	ROG	NOx	PM ₁₀	PM _{2.5}	ROG	NOx	PM ₁₀	PM _{2.5}
Chemical Delivery trips	42	1.4	3	25	70	0.1073	4.1443	0.1168	0.0537	0.02	0.72	0.02	0.01
Residuals Hauling trips	76	2.5	5	25	127	0.1073	4.1443	0.1168	0.0537	0.03	1.30	0.03	0.02
Total Project Average Daily	(lbs/day)									0.05	2.02	0.05	0.03

CAP Emissions from Testing & Maintenance of Backup Generator

Fourse	kW	hp	Max. Daily use	Max. Annual use	x. Annual use Emission Factors ² (g/hp-hr)						Avg. Daily Emissions (lb/day)				
Source			(hours/day) ¹	(hours/year) ¹	ROG	NOx	PM10	PM _{2.5}	ROG	NOx	PM10	PM _{2.5}			
Backup Generator	2000	2682	1	50	0.209	3.969	0.052	0.052	0.17	3.21	0.04	0.04			

GHG Emissions Summary

Source	GHG Emissions as CO ₂ e (tons/year)
Backup Generator	32.6
Truck trips	122.6
Electricity	2320.9
TOTAL	2476.1

Indirect GHG Emissions from Electricity Generation

Carrier	Consumption	GHG Er	GHG Emission Factors (lb/MW-hr) ³ GHG Emissions (tons/year)								
Source	MW-hr/year	CO2	CH₄	N ₂ O	CO2	CH4	N ₂ O	CO2e			
Electricity Consumption	8760	527.9	0.033	0.004	2312.2	0.14	0.02	2320.9			

GHG Emissions from Testing & Maintenance of Backup Generator

Country	h	Max. Annual use		GHG Er		GHG Emissions (tons/year)					
Source	np	(hours/year) ¹	CO ₂ (lb/hp-hr)	CH4 (g/gal)	CH₄ (g/hp-hr)	N ₂ O (g/gal)	N ₂ O (g/hp-hr)	CO2	CH₄	N ₂ O	CO ₂ e
Backup Generator	2682	50	0.48	0.58	0.01	0.26	0.01	32.39	0.0017	0.0007	32.6

GHG Emissions from On-road Truck Trips during Operation

Trips	Ave. Truck	Ave. Truck Ave. Truck		One Way Trin	Truck Trip	Emiss	Total Emissions (tons/year)					
	Trips/month (round trips)	Trips/year (round trips)	trips/year	length (miles)	miles per year	CO2	CH₄	N ₂ O	CO2	CH₄	N ₂ O	CO ₂ e
Chemical Delivery trips	42	504	1008	25	25200	1636.7213	0.0051	0.0048	43.59	0.000129	0.000121	43.63
Residuals Hauling trips	76	912	1824	25	45600	1636.7213	0.0051	0.0048	78.88	0.000233	0.000219	78.95
Total GHG emissions from	n operational truck tri	ps (tons/year)	-	-			-		122.47	0.00036	0.00034	122.57

NOTES:

1. Consistent with BAAQMD Regulation 9, Rule 8, assumes a maximum operation of 50 hours per year and 1 hour per day for testing and maintenance.

2. Emission factors derived from Engineering Evaluation of a 2220 BHP Cummins, Model QSK50-G4 NR2, Year 2015 for Uber Technologies 3. GHG emissions factors from USEPA eGRID Summary Table 1. Available at https://www.epa.gov/sites/production/files/2018-02/documents/egrid2016_summarytables.pdf

2. One entissions factors from USEPA eGRID Summary Table 1. Available at https://www.epa.gov/sites/production/files/2018-02/documents/egrid2016_summarytables.pdf
4. C0₂ emission factor as calculated from OFFROAD2017 - ORION web database available at https://www.arb.ca.gov/orion/derived from EMFAC2014, CH₄ and N₂O emission factors for Other Large Utility Diesel equipment from Table 13.7, page 42 of the 2017 TCR
Default Emission Factors available at http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission-Factors.pdf
5. C0₂ emission factor derived from EMFAC2014, CH₄ and N₂O emission factors from Table 13.4, page 36 of the 2017 TCR Default Emission Factors available at http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission Factors available at http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-EmissionFactors available at http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry
OFFROAD2017 (v1.0.1) Emissions Inventory Region Type: Air Basin Region: San Francisco Bay Area Calendar Year: 2020 Scenario: All Adopted Rules - Exhaust Vehicle Classification: OFFROAD2017 Equipment Types Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-hours/year

Region	CalYr	VehClass	MdlYr	HP_Bin Fuel	HC_tpd	ROG_tpd	ROG_lb/hp-hr	TOG_tpd	CO_tpd	NOx_tpd	NOx_lb/hp-hr	CO2_tpd	CO2_lb/hp-hr PM10_tp	od PM10_lb/hp-hr	PM2_5_tpd	PM _{2.5} _lb/hp-hr	PM_tpd	SOx_tpd	NH3_tpd Fue	l_gpy Total_Act	tivity_hpy	Total_Population	Horsepower_Hours_hhpy hp-hr/gal
San Francisco Bay Area	2020 ConstMin	- Bore/Drill Rigs	Aggregated	25 Diesel	0	0	0	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0 0
San Francisco Bay Area	2020 ConstMin	- Bore/Drill Rigs	Aggregated	50 Diesel	0.000150456	0.000182051	0.000792079	0.000216656	0.001147122	0.001181453	0.005140322	0.152291	0.662595888 7.4804E	05 0.000325461	6.882E-05	0.000299424	7.48E-05	1.4E-06	1.24E-06 494	40.919 42	276.895687	12.30394411	167783.3298 33.95792
San Francisco Bay Area	2020 ConstMin	- Bore/Drill Rigs	Aggregated	100 Diesel	0.000250071	0.000302586	0.000255439	0.000360102	0.001749182	0.003471621	0.002930701	0.203301	0.575562463 0.000110	0.000240322 0.000149216	0.00010132 0.00016262	0.000137279	0.000117	6.3E-06	5.56E-06 22	120.06 10	092.34699	27.19819225	864736.3284 39.09285
San Francisco Bay Area	2020 ConstMin	- Bore/Drill Rigs	Aggregated	175 Diesel	0.00030043	0.00036352	0.000193623	0.000432619	0.00612368	0.00389144	0.002072712	1.10104	0.586451146 0.000172	43 9.18403E-05	0.00015863	8.44931E-05	0.000172	1.02E-05	8.99E-06 35	722.03 91	167.768968	29.65898107	1370547.62 38.36701
San Francisco Bay Area	2020 ConstMin	- Bore/Drill Rigs	Aggregated	300 Diesel	0.000355729	0.000430432	0.000160771	0.00051225	0.003200889	0.005454972	0.00203749	1.554825	0.580743529 0.000158	52 5.92075E-05	0.00014583	5.44709E-05	0.000159	1.44E-05	1.27E-05 504	444.57 94	\$53.810294	29.65898107	1954428.942 38.74409
San Francisco Bay Area	2020 ConstMin	- Bore/Drill Rigs	Aggregated	600 Diesel	0.000542673	0.000656635	0.000127813	0.00078145	0.00561296	0.007504449	0.001460731	2.974786	0.579038288 0.000236	38 4.60105E-05	5 0.00021747	4.23297E-05	0.000236	2.75E-05	2.43E-05 96	513.66 89	953.671369	25.64400983	3750346.05 38.85819
San Francisco Bay Area	2020 Constituin	- Bore/Drill Rigs	Aggregated	9999 Diesel	0.000194367	0.000235184	0.000123698	0.000279888	0.002073782	0.002591987	0.001363286	0.823357	0.59053337 9.07735	27 0.00010795	0.00014009	4.39238E-05 9 93209F-05	9.082-05	1.04E-05 7.61E-06	9.10E-06 26	30427 21 712 91 55	3 4466265	4.921577645	1029628 146 38 54422
San Francisco Bay Area	2020 ConstMin	- Cranes	Aggregated	25 Diesel	4.52128E-06	5.47075E-06	0.000699882	6.51065E-06	2.56306E-05	2.34414E-05	0.0029989	0.002912	0.372584518 1.759E	06 0.000225038	3 1.6183E-06	0.000207035	1.76E-06	2.68E-08	2.38E-08 94.	48879 22	28.2471216	0.487981182	5706.178041 60.39
San Francisco Bay Area	2020 ConstMin	- Cranes	Aggregated	50 Diesel	0.000144396	0.000174719	0.001393302	0.000207931	0.000612294	0.000494138	0.003940506	0.04719	0.376320859 5.2183E	05 0.000416135	4.8009E-05	0.000382844	5.22E-05	4.32E-07	3.85E-07 153	31.043 22	220.238496	5.205132612	91541.68327 59.79041
San Francisco Bay Area	2020 ConstMin	- Cranes	Aggregated	75 Diesel	4.36193E-05	5.27794E-05	0.000839776	6.28118E-05	0.000182155	0.000398719	0.006344039	0.021216	0.337569825 3.701E	05 0.000588872	3.4049E-05	0.000541762	3.7E-05	1.95E-07	1.73E-07 68	8.3313 65	5.1672148	1.789264335	45880.03012 66.654
San Francisco Bay Area	2020 ConstMin 2020 ConstMin	- Cranes	Aggregated	100 Diesel 175 Diesel	0.001267059	0.001533141	0.000467704	0.001824564	0.008/34591	0.013440798	0.004100284	1.095214	0.334108686 0.000947	286 0.00028915	0.00087203	0.000266025	0.000948	1.01E-05 2 98E-05	8.94E-06 35	533.01 2/ 1915.3 47	/106./9509	62.78691214	2392952.276 67.34449
San Francisco Bay Area	2020 ConstMin	- Cranes	Aggregated	300 Diesel	0.003422154	0.004140806	0.000238288	0.004927901	0.019438319	0.049697837	0.00285992	5.824238	0.33516257 0.002031	.93 0.00018842	0.00186937	0.000107575	0.002032	5.37E-05	4.75E-05 1	88961 57	7053.97864	123.1339184	12685466.14 67.13273
San Francisco Bay Area	2020 ConstMin	- Cranes	Aggregated	600 Diesel	0.004529351	0.005480514	0.000189619	0.006522265	0.044091818	0.066655759	0.002306203	9.670084	0.334572426 0.002626	94 9.08886E-05	0.00241678	8.36175E-05	0.002627	8.93E-05	7.89E-05 31	3735.2 57	7000.27343	118.4167669	21099051.98 67.25114
San Francisco Bay Area	2020 ConstMin	- Cranes	Aggregated	750 Diesel	0.00015521	0.000187804	0.000407918	0.000223502	0.001528509	0.002001435	0.004347195	0.154917	0.336486194 0.00010	0.000224146	9.4941E-05	0.000206215	0.000103	1.43E-06	1.26E-06 502	26.119 52	25.0772416	1.301283153	336089.8043 66.86865
San Francisco Bay Area	2020 ConstMin	- Cranes	Aggregated	9999 Diesel	0.000649213	0.000785547	0.000485323	0.000934866	0.006705655	0.008985756	0.005551537	0.542282	0.335030194 0.000428	0.000264902	0.00039447	0.00024371	0.000429	4.99E-06	4.43E-06 17	593.75 12	259.350772	2.602566306	1181582.914 67.15926
San Francisco Bay Area	2020 Constivin 2020 ConstMin	- Crawler Tractors	Aggregated	25 Diesel	0 00044908	0 000543387	0 001962184	0 000646676	0 001932307	0 001493637	0 005393555	0 152684	0 551345084 0 000156	0 000565059	0 00014396	0 000519854	0 000156	0 1 4F-06	0 1 25E-06 49	0 53.662 48	U 310 282649	U 14 43655093	202158 8229 40 80997
San Francisco Bay Area	2020 ConstMin	- Crawler Tractors	Aggregated	75 Diesel	0.000153877	0.000186191	0.001859573	0.000221583	0.000603587	0.001474527	0.014726763	0.050397	0.503332964 0.000108	0.001079739	9.9461E-05	0.00099336	0.000108	4.61E-07	4.11E-07 10	535.06 1	1012.23342	4.908427316	73091.71698 44.70277
San Francisco Bay Area	2020 ConstMin	- Crawler Tractors	Aggregated	100 Diesel	0.007309529	0.00884453	0.000660339	0.010525721	0.050578468	0.074461902	0.005559379	6.698646	0.50012572 0.006219	0.000464335	0.00572172	0.000427188	0.006219	6.17E-05	5.47E-05 21	7330.2 11	1712.9852	242.6784211	9777564.471 44.98944
San Francisco Bay Area	2020 ConstMin	- Crawler Tractors	Aggregated	175 Diesel	0.00552001	0.006679212	0.000452842	0.007948815	0.046714559	0.068268163	0.004628491	7.360018	0.498999479 0.003819	0.00025893	0.00351357	0.000238215	0.003819	6.79E-05	6.01E-05 23	8787.7 72	2219.29578	163.4217565	10767172.36 45.09099
San Francisco Bay Area	2020 ConstMin	- Crawler Tractors	Aggregated	300 Diesel	0.005132035	0.006209762	0.000393643	0.00739013	0.032640067	0.077057911	0.004884772	7.867823	0.498748509 0.003092	0.000196013	0.00284476	0.000180332	0.003092	7.26E-05	6.42E-05 25	5262.8 55	5679.11828	130.0733239	11515844.83 45.11368
San Francisco Bay Area	2020 ConstMin	- Crawler Tractors	Aggregated	750 Diesel	0.000337458	0.000408324	0.000355364	0.00048594	0.002106055	0.006475876	0.005635948	0.572186	0.497972527 0.000123	0.00011483	0.00017456	0.000151922	0.000123	5.28E-06	4.67E-06 18	+021.0 10 563.93 13	351.523242	3.031675695	838792.2854 45.18398
San Francisco Bay Area	2020 ConstMin	- Crawler Tractors	Aggregated	9999 Diesel	0.001032899	0.001249807	0.000398386	0.001487374	0.005270605	0.020248377	0.006454333	1.568628	0.500012845 0.000574	11 0.000183004	0.00052819	0.000168363	0.000574	1.45E-05	1.28E-05 508	392.42 23	341.051458	4.330965279	2290138.446 44.9996
San Francisco Bay Area	2020 ConstMin	- Excavators	Aggregated	25 Diesel	4.22352E-06	5.11046E-06	0.00333879	6.08187E-06	1.43511E-05	9.7479E-06	0.006368547	0.000755	0.493348074 1.3586E	06 0.000887585	5 1.2499E-06	0.000816578	1.36E-06	6.85E-09	6.16E-09 24	4.4995 44	1.69445277	0.144654186	1117.361319 45.60751
San Francisco Bay Area	2020 ConstMin	- Excavators	Aggregated	50 Diesel	0.005094341	0.006164153	0.000498721	0.007335851	0.046788405	0.041915323	0.00339123	6.110803	0.494404872 0.002309	0.000186825	0.00212441	0.000171879	0.002309	5.63E-05	4.99E-05 198	8258.3 25	52271.6266	353.2455233	9022739.493 45.51003
San Francisco Bay Area	2020 ConstMin	- Excavators	Aggregated	75 Diesel	0.000109037	0.000131935	0.000304305	0.000157013	0.001377725	0.001949497	0.004496488	0.192977	0.445097973 0.000112	0.000260112	0.00010375	0.000239303	0.000113	1.78E-06 7 15E-05	1.58E-06 620	50.914 43	312.772664	6.364784203	316498.703 50.55152
San Francisco Bay Area	2020 ConstMin	- Excavators	Aggregated	175 Diesel	0.006103638	0.007385402	0.000196162	0.008789239	0.097902527	0.07261592	0.001928737	16.7427	0.444699313 0.003529	35 9.37423E-05	0.00244754	8.62429E-05	0.003529	0.000155	0.000137 543	3198.3 18	38237.5453	325.905882	27484116.39 50.59684
San Francisco Bay Area	2020 ConstMin	- Excavators	Aggregated	300 Diesel	0.005975342	0.007230163	0.00015101	0.008604492	0.04575024	0.082610357	0.001725406	21.2933	0.444733382 0.002519	13 5.26148E-05	0.0023176	4.84056E-05	0.002519	0.000197	0.000174 690	0837.7 1	160024.535	280.3398133	34951524.5 50.59296
San Francisco Bay Area	2020 ConstMin	- Excavators	Aggregated	600 Diesel	0.009005138	0.010896217	0.000128009	0.012967399	0.078324795	0.111130803	0.001305571	37.75282	0.443522458 0.003658	4.2976E-05	0.00336548	3.95379E-05	0.003658	0.000349	0.000308 12	24849 18	34008.6756	294.081961	62137917.56 50.73109
San Francisco Bay Area	2020 ConstMin	- Excavators	Aggregated	750 Diesel	0.000274587	0.000332251	0.000220082	0.000395406	0.001764	0.004223254	0.002797479	0.669637	0.443566668 0.000138	9.17038E-05	0.00012737	8.43675E-05	0.000138	6.18E-06	5.47E-06 21	725.63 17	759.218839	3.182392101	1102055.077 50.72604
San Francisco Bay Area	2020 Constituin	- Excavators - Graders	Aggregated	25 Diesel	0.000259126	0.000313542	0.000132203	0.000373141	0.002333083	0.00654408	0.00275927	1.055234	0.444932698 0.00012	0 5.1/349E-05	0.00011288	4.75961E-05 0	0.000123	9.75E-06 0	8.01E-06 34.	0	128/2/	2.169812796	1/31319.981 50.5703
San Francisco Bay Area	2020 ConstMin	- Graders	Aggregated	50 Diesel	0.000145238	0.000175738	0.002444811	0.000209143	0.000565045	0.000405203	0.005637044	0.038003	0.528681395 4.979E	05 0.000692665	4.5807E-05	0.000637252	4.98E-05	3.47E-07	3.1E-07 123	32.957 14	149.395362	4.215538693	52473.92764 42.55943
San Francisco Bay Area	2020 ConstMin	- Graders	Aggregated	75 Diesel	6.34055E-05	7.67206E-05	0.000582611	9.13039E-05	0.000481321	0.0005889	0.004472068	0.062631	0.475614336 4.1654E	05 0.000316318	3.8322E-05	0.000291013	4.17E-05	5.77E-07	5.11E-07 203	31.988 13	337.841049	3.63408508	96129.33545 47.30803
San Francisco Bay Area	2020 ConstMin	- Graders	Aggregated	100 Diesel	0.001518819	0.001837771	0.00102644	0.002187099	0.007711279	0.014281705	0.007976682	0.843747	0.471253479 0.001180	48 0.000659329	0.00108604	0.000606582	0.00118	7.76E-06	6.89E-06 27	374.45 14	4550.21721	40.41102609	1307015.273 47.74581
San Francisco Bay Area	2020 ConstMin	- Graders	Aggregated	175 Diesel	0.008890005	0.010756906	0.000501149	0.012801607	0.069280116	0.104999156	0.004891763	10.22425	0.476333274 0.005861	.27 0.000273068	3 0.00539237 0.00535603	0.000251223	0.005861	9.43E-05	8.34E-05 33	1714.4 10	05426.9335	228.6566332	15669071.89 47.23663
San Francisco Bay Area	2020 ConstMin	- Graders	Aggregated	600 Diesel	0.000503786	0.000609581	0.000309503	0.000725452	0.002182779	0.008063686	0.004094183	0.941483	0.478019917 0.000249	0.00012857	0.00022957	0.000118103	0.003825	8.69E-06	7.68E-06 30	545.37 40	98.486024	5.669172725	1437769.284 47.06996
San Francisco Bay Area	2020 ConstMin	- Graders	Aggregated	9999 Diesel	0.000569943	0.000689631	0.000448284	0.000820717	0.002913232	0.009544257	0.006204107	0.73183	0.475715369 0.000299	0.000194549	0.00027535	0.000178985	0.000299	6.75E-06	5.97E-06 23	743.41 62	20.6830123	0.872180419	1123015.329 47.29799
San Francisco Bay Area	2020 ConstMin	 Off-Highway Tractors 	Aggregated	25 Diesel	0	0	0	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0 0
San Francisco Bay Area	2020 ConstMin	- Off-Highway Tractors	Aggregated	50 Diesel	0.003614679	0.004373761	0.000970818	0.005205138	0.023862412	0.020167185	0.00447639	2.534255	0.562513466 0.001502	0.000333427	0.00138199	0.000306753	0.001502	2.33E-05	2.07E-05 822	221.11 87	7167.97522	135.4496712	3288820.981 39.99972
San Francisco Bay Area	2020 ConstMin	- Off-Highway Tractors	Aggregated	75 Diesel	0.000914277	0.001106275	0.000322141	0.001316558	0.011887982	0.010606855	0.003088661	1./40/12	0.506886281 0.000635	0.0001861:	0.00058806	0.0001/1239	0.000639	1.61E-05	1.42E-05 564	1/5.49 35 068.05 2	0352.09432	56.23516379	2506913.124 44.3894
San Francisco Bay Area	2020 ConstMin	- Off-Highway Tractors	Aggregated	175 Diesel	0.001165498	0.001410253	0.00025955	0.001678317	0.016731346	0.015041144	0.002768244	2.752837	0.50664518 0.000729	0.000134302	0.00067135	0.000123558	0.001224	2.54E-05	2.25E-05 893	312.76 25	5051.42172	37.39495663	3966426.566 44.41053
San Francisco Bay Area	2020 ConstMin	- Off-Highway Tractors	Aggregated	300 Diesel	0.000933727	0.00112981	0.000232048	0.001344567	0.006009544	0.013537264	0.002780378	2.462452	0.505755599 0.000458	9.41775E-05	0.00042185	8.66433E-05	0.000459	2.27E-05	2.01E-05 798	391.54 16	5379.56755	26.11937811	3554266.026 44.48864
San Francisco Bay Area	2020 ConstMin	- Off-Highway Tractors	Aggregated	600 Diesel	0.001892957	0.002290478	0.000153667	0.002725858	0.015224819	0.022462394	0.001506991	7.532762	0.505369427 0.000760	004 5.09906E-05	0.00069923	4.69113E-05	0.00076	6.96E-05	6.15E-05 24	4392.2 30	0439.05192	44.95958526	10880982.7 44.52263
San Francisco Bay Area	2020 ConstMin	- Off-Highway Tractors	Aggregated	750 Diesel	0.000163268	0.000197554	0.000225425	0.000235105	0.000885521	0.001968855	0.00224663	0.438597	0.50047633 7.991E	05 9.11841E-05	5 7.3517E-05	8.38894E-05	7.99E-05	4.05E-06	3.58E-06 14	4229.8 1	1003.30503	1.427288421	639742.2907 44.95793
San Francisco Bay Area	2020 Constivin 2020 ConstMin	- Off-Highway Trucks	Aggregated	25 Diesel	3 30301F-05	3 99664F-05	0.000228041	4 75634F-05	0.001027723	9.83007F-05	0.003436135	0.428148	0.506560987 7.6435E	05 9.04338E-05	9 3476F-06	8.31991E-05 0.000429478	7.64E-05 1.02E-05	3.95E-06 9.84E-08	3.49E-06 138 8 77E-08 349	390.79 37 3 7626 63	7.4732189	0.713644211	616999.9565 44.41791 15888 48604 45 55674
San Francisco Bay Area	2020 ConstMin	- Off-Highway Trucks	Aggregated	50 Diesel	0.000267121	0.000323217	0.000681489	0.000384655	0.002235621	0.001877232	0.003958066	0.232926	0.491114242 0.000130	0.000275387	0.00012016	0.000253356	0.000131	2.15E-06	1.9E-06 75	57.019 1	12028.2425	7.636531587	346224.5085 45.81496
San Francisco Bay Area	2020 ConstMin	- Off-Highway Trucks	Aggregated	75 Diesel	3.47539E-05	4.20522E-05	0.000254423	5.00456E-05	0.000544197	0.000319326	0.001931975	0.073369	0.443895427 1.2871E	-05 7.7874E-05	5 1.1842E-05	7.16441E-05	1.29E-05	6.77E-07	5.99E-07 23	30.381 16	596.191515	1.131338013	120657.8755 50.68847
San Francisco Bay Area	2020 ConstMin	- Off-Highway Trucks	Aggregated	100 Diesel	0.000125558	0.000151926	0.000397061	0.000180804	0.001282672	0.001291054	0.003374196	0.169874	0.443969612 0.00010	0.00027232	9.5861E-05	0.000250534	0.000104	1.57E-06	1.39E-06 55	11.382 31	173.280453	2.545510529	279316.8241 50.68
San Francisco Bay Area	2020 ConstMin	- Off-Highway Trucks	Aggregated	1/5 Diesel	0.00286422	0.003465706	0.000265182	0.004124476	0.036932076	0.029357006	0.002246278	5./98068	0.443644427 0.0015	86 0.00011//2	0.00141551	0.000108309 7.55829E-05	0.001539	5.35E-05	4./3E-05 188	3111.9 60 2204.1 02)4/4.6//49	44.1221825	9540499.464 50.71714
San Francisco Bay Area	2020 ConstMin	- Off-Highway Trucks	Aggregated	600 Diesel	0.019578573	0.023690074	0.000207557	0.028193145	0.137228367	0.227261642	0.001991116	50.67965	0.444021645 0.008297	27 7.26952E-05	0.00763349	6.68796E-05	0.008297	0.000468	0.000414 16	44246 22	21355.5955	166.5895224	83320593.95 50.67406
San Francisco Bay Area	2020 ConstMin	- Off-Highway Trucks	Aggregated	750 Diesel	0.008249766	0.009982217	0.00025939	0.011879663	0.064076914	0.096511076	0.002507859	17.06785	0.443511327 0.003775	9.80972E-05	0.00347311	9.02494E-05	0.003775	0.000158	0.000139 553	3747.4 42	2364.72161	35.6371474	28092917.63 50.73236
San Francisco Bay Area	2020 ConstMin	- Off-Highway Trucks	Aggregated	9999 Diesel	0.013387791	0.016199227	0.000238276	0.019278419	0.079927839	0.246711746	0.003628901	30.3145	0.445898196 0.006235	9.17221E-05	0.00573689	8.43844E-05	0.006236	0.00028	0.000247 98	3520.6 39	264.79083	28.42486757	49629235.94 50.4608
San Francisco Bay Area	2020 ConstMin	- Other Construction Equipment	Aggregated	25 Diesel	0 00205007	0 002481674	0	0	0	0	0	1 266971	0 520212047 0 000027	0 00026007	0 00086384	0	0	1 265 05	1 125 05 44	0	0	104 5606225	
San Francisco Bay Area	2020 ConstMin	- Other Construction Equipment	Aggregated	75 Diesel	0.00205097	0.002481074	0.001000857	0.0023535397	0.0012308738	0.002699338	0.004598345	0.153276	0.478890403 0.000937	0.000559975 0.000627981	0.00086284	0.000340377	0.000938	1.20E-05	1.25E-06 44	72.874 21	198,736799	10.41474033	233647.5096 46.9844
San Francisco Bay Area	2020 ConstMin	- Other Construction Equipment	Aggregated	100 Diesel	0.003214622	0.003889693	0.000454171	0.004629056	0.028892442	0.036007197	0.004204302	4.137152	0.483065537 0.00266	0.000311594	0.00245512	0.000286666	0.002669	3.82E-05	3.38E-05 134	4225.3 76	5233.73464	173.9543115	6251990.233 46.57831
San Francisco Bay Area	2020 ConstMin	- Other Construction Equipment	Aggregated	175 Diesel	0.001429504	0.0017297	0.000356712	0.002058486	0.014387537	0.018320038	0.003778095	2.335593	0.481663496 0.00096	0.000199648	0.00089065	0.000183676	0.000968	2.16E-05	1.91E-05 75	775.76 23	3240.13525	57.5625513	3539780.815 46.7139
San Francisco Bay Area	2020 ConstMin	- Other Construction Equipment	Aggregated	300 Diesel	0.001511386	0.001828777	0.000284651	0.002176396	0.009731002	0.022884295	0.003561959	3.12114	0.485808023 0.000870	0.000135562	0.00080126	0.000124717	0.000871	2.88E-05	2.55E-05 1	01262 21	1372.16463	54.18479768	4689985.086 46.31537
San Francisco Bay Area	2020 ConstMin 2020 ConstMin	- Other Construction Equipment	Aggregated	500 Diesel	0.004026399	0.004871942	0.00019762	0.005/98014	0.034160738	0.058903261	0.002389291	11.89536 2 175538	0.482511047 0.002081	.05 8.44134E-05 34 6.45297F-05	0.00191456	7.76603E-05 5.93674F-05	0.002081	0.00011 2.01F-05	9./1E-05 38	582 92 52	323 535709	107.8066364	1/996/13.23 46.63184 3295818 314 46 69429
San Francisco Bay Area	2020 ConstMin	- Other Construction Equipment	Aggregated	9999 Diesel	0.000230892	0.00027938	0.000179759	0.000332485	0.001571927	0.005381286	0.003462438	0.750711	0.483023663 0.000126	06 8.11108E-05	0.00011598	7.46219E-05	0.000126	6.93E-06	6.13E-06 243	355.98 12	243.639229	2.674054951	1134558.709 46.58235
San Francisco Bay Area	2020 ConstMin	- Pavers	Aggregated	25 Diesel	0	0	0	0	0	0	0	0	0	0 () 0	0	0	0	0	0	0	0	0 0
San Francisco Bay Area	2020 ConstMin	- Pavers	Aggregated	50 Diesel	0.000309823	0.000374885	0.001204772	0.000446144	0.001570873	0.001354887	0.004354214	0.167398	0.537968658 0.000114	37 0.000367562	0.00010522	0.000338157	0.000114	1.54E-06	1.37E-06 543	31.044 58	368.867261	16.93986666	227151.8079 41.8247
San Francisco Bay Area	2020 ConstMin	- Pavers	Aggregated	75 Diesel	0.000432849	0.000523748	0.000919487	0.000623303	0.002116548	0.003935104	0.006908437	0.274178	0.481344889 0.000375	81 0.000659768	0.00034574	0.000606987	0.000376	2.52E-06	2.24E-06 889	95.408 57	749.197291	16.37520444	415814.2055 46.74482
San Francisco Bay Area	2020 ConstMin 2020 ConstMin	- ravers - Pavers	Aggregated	100 Diesel	0.000737921	0.000892884	0.000321867	0.001062606	0.008896046	0.00946627	0.003412403	1.335762	0.484324283 0.000613	0.00021825 0.000133946	0.00056462	0.00020079	0.000605	1.23E-05 2.05F-05	1.81E-05 710	557.51 24 995.95 21	+399.37163	05.21848664 56.32505665	2025076.497 46.72824 3344734 555 46 45726
San Francisco Bay Area	2020 ConstMin	- Pavers	Aggregated	300 Diesel	0.000481291	0.000582362	0.000162447	0.000693059	0.00335798	0.008976288	0.002503894	1.730904	0.482827458 0.000258	11 7.19982E-05	0.00023746	6.62384E-05	0.000258	1.6E-05	1.41E-05 56	157.26 11	1818.19683	26.9626211	2617000.3 46.60128
San Francisco Bay Area	2020 ConstMin	- Pavers	Aggregated	600 Diesel	7.21839E-05	8.73425E-05	0.000135122	0.000103945	0.000587303	0.001108318	0.001714614	0.313212	0.484552837 3.7978E	05 5.87536E-05	3.494E-05	5.40533E-05	3.8E-05	2.89E-06	2.56E-06 10	161.83 12	285.192493	2.964476666	471868.2964 46.43535
San Francisco Bay Area	2020 ConstMin	- Pavers	Aggregated	750 Diesel	1.1739E-05	1.42042E-05	0.000105914	1.69042E-05	0.000118801	0.000145825	0.001087347	0.064828	0.483391796 6.4017E	06 4.77343E-05	5.8896E-06	4.39156E-05	6.4E-06	5.99E-07	5.29E-07 210	03.279 13	30.5347435	0.282331111	97901.05762 46.54688
San Francisco Bay Area	2020 ConstMin	- Paving Equipment	Aggregated	25 Diesel	0	0	0	0	0	0	0	0	0	0 000170120	0	0	0	0	0	0	0	0	
San Francisco Bay Area	2020 Constiviin	- raving Equipment	Aggregated	SU Diesei	0.000184022	0.00022266/	0.000488269	0.000264992	0.001513327	0.001416106	0.003105267	0.208476	0.45/151546 /.//25E	0.0001/0438	0 7.1507E-05	0.000126803	7.77E-05	1.92E-00	1./E-Ub 6/0	95.784 95	991.109121	20.85890381	332904.3887 49.21866

Con Francisco Dou Area	2020 ConstMin Devine Ferriement	Aggregated	75 Dissal	2 26275 05	4 000075 05	0.000050050	4 942205 05	0.000010004	0.00024005	0.005(71212 0.025425	0 412281402 2 00025 05	0 000426247 2 4755 05	0 000401420 2 005 05 2 245 07 2 085 07 824 8788	(70 4880883	1 822201011	45003 03331 54 56305
San Francisco Bay Area	2020 Constituin - Paving Equipment	Aggregateu	100 Diesel	5.5027E=05	4.006672-05	0.000039938	4.04229E-03	0.000212804	0.00034903	0.003071212 0.023423	0.412381492 2.09022-03	0.000430347 2.4732-03	0.000401439 2.092-03 2.342-07 2.082-07 824.8788	070.4009002	1.032201011	43007.07771 34.30203
San Francisco Bay Area	2020 Constivin - Paving Equipment	Aggregated	100 Diesei	0.000492435	0.000595846	0.00028308	0.000709106	0.00579961	0.005819671	0.002764867 0.871338	0.413964057 0.00038184	0.000181408 0.00035129	0.000166895 0.000382 8.04E-06 7.11E-06 28269.61	17284.93886	38.33528268	1536551.133 54.35346
San Francisco Bay Area	2020 ConstMin - Paving Equipment	Aggregated	175 Diesel	0.000408639	0.000494453	0.00021611	0.00058844	0.005526323	0.004930073	0.002154775 0.943819	0.412512532 0.0002657	0.000116131 0.00024445	0.00010684 0.000266 8.71E-06 7.7E-06 30621.16	11536.8124	25.65081415	1670222.435 54.54471
San Francisco Bay Area	2020 ConstMin - Paving Equipment	Aggregated	300 Diesel	0.000241966	0.000292779	0.00018095	0.000348431	0.001499288	0.003828276	0.002366035 0.669441	0.413742457 0.00013569	8.3862E-05 0.00012483	7.7153E-05 0.000136 6.18E-06 5.46E-06 21719.27	5052.484313	10.99320606	1181149.948 54.38257
San Francisco Bay Area	2020 ConstMin - Paving Equipment	Aggregated	600 Diesel	0.000224	0.00027104	0.000163129	0.00032256	0.001481951	0.00359503	0.002163715 0.689684	0.415095127 0.00011039	6.64406E-05 0.00010156	6.11254E-05 0.00011 6.37E-06 5.63E-06 22376.03	2946.850196	6.483172807	1212900.903 54.20535
San Francisco Bay Area	2020 ConstMin - Paving Equipment	Aggregated	750 Diesel	2.85178E-05	3.45065E-05	0.000173403	4.10656E-05	0.000160459	0.000483712	0.002430757 0.082263	0.413388881 1.2337E-05	6.19944E-05 1.135E-05	5.70348E-05 1.23E-05 7.6E-07 6.71E-07 2668.929	212.5442232	0.422815618	145267.3739 54.42908
San Francisco Bay Area	2020 ConstMin - Paving Equipment	Aggregated	9999 Diesel	8 58518F-06	1 03881E-05	7 01229E=05	1 23627E-05	0.000112527	0.000268591	0.001813078 0.061245	0.413424804 4.3259E-06	2 92013E-05 3 9798E-06	2 68652E-05 4 33E-06 5 66E-07 5E-07 1987 031	128 2811288	0 281877079	108142 8781 54 42436
San Francisco Day Area	2020 Constituin Failing Equipment	Aggregated	25 Diesel	2.041725.00	2.550495.00	0.002208571	4.2200272.00	0.000112527	0.0002000001	0.0001013070 0.001243	0.495122877 0.24565 07	0.00084343 8 5085 07		22 20251000	0.145206242	800 8270772 46 28078
San Francisco Bay Area	2020 Constivin - Rollers	Aggregated	25 Diesei	2.94172E-06	3.55948E-06	0.003208571	4.23608E-06	9.82057E-06	6.96522E-06	0.00627855 0.000538	0.485122877 9.3456E-07	0.00084243 8.598E-07	0.0007/5036 9.35E-07 4.89E-09 4.39E-09 17.46064	32.39351909	0.145206242	809.8379772 46.38078
San Francisco Bay Area	2020 ConstMin - Rollers	Aggregated	50 Diesel	0.004473339	0.00541274	0.000764057	0.006441608	0.027625624	0.026512666	0.003742502 3.439854	0.485566428 0.00192247	0.000271375 0.00176868	0.000249665 0.001922 3.17E-05 2.81E-05 111602.3	144774.4112	428.2132085	5171472.489 46.33841
San Francisco Bay Area	2020 ConstMin - Rollers	Aggregated	75 Diesel	8.90646E-05	0.000107768	0.001521468	0.000128253	0.000356333	0.000873961	0.012338558 0.030962	0.4371273 6.1398E-05	0.00086682 5.6486E-05	0.000797474 6.14E-05 2.84E-07 2.53E-07 1004.543	746.1847122	3.339743572	51707.15064 51.47329
San Francisco Bay Area	2020 ConstMin - Rollers	Aggregated	100 Diesel	0.003164648	0.003829224	0.000312948	0.004557093	0.035456342	0.038490003	0.003145643 5.344384	0.436776437 0.00244817	0.000200079 0.00225231	0.000184073 0.002448 4.93E-05 4.36E-05 173392.7	102387.4915	316.1139894	8932259.645 51.51463
San Francisco Bay Area	2020 ConstMin - Pollers	Aggregated	175 Diesel	0.001872822	0.002266128	0.000177847	0.00269688	0.02088621	0.025815504	0.002026025 5.558159	0.426208072 0.00118585	9 306645-05 0 00109098	8 56211E-05 0 001186 5 12E-05 4 54E-05 180228 4	64686 78023	184 7022402	9201652 462 51 58176
San Francisco Day Area	2020 Constituin - Rollers	Aggregated	175 Diesel	0.0018/2855	0.002200128	0.000177847	0.00203088	0.03088021	0.025815554	0.002020025 5.558155	0.430208072 0.00118385	5.300042-05 0.00105058	0.202015-05 0.0001180 0.155-05 4.545-05 180528.4	3446 604425	22 66064 740	4520000 705 54 54400
San Francisco Bay Area	2020 Constivin - Rollers	Aggregated	300 Diesei	0.000348192	0.000421312	0.000199961	0.000501396	0.002/3542/	0.005384611	0.002555617 0.920324	0.436799804 0.00018922	8.98045E-05 0.00017408	8.26201E-05 0.000189 8.5E-06 7.51E-06 29858.91	/116.6941/6	23.66861749	1538088.705 51.51188
San Francisco Bay Area	2020 ConstMin - Rollers	Aggregated	600 Diesel	0.000142253	0.000172126	0.000139904	0.000204844	0.001581629	0.002142117	0.001741114 0.539971	0.43888869 7.2458E-05	5.88939E-05 6.6661E-05	5.41824E-05 7.25E-05 4.99E-06 4.41E-06 17518.76	2568.968031	8.567168294	898129.3583 51.26671
San Francisco Bay Area	2020 ConstMin - Rough Terrain Forklifts	Aggregated	25 Diesel	2.61659E-07	3.16608E-07	0.000177279	3.76789E-07	5.72224E-06	7.69191E-06	0.004306956 0.00093	0.5205032 2.5191E-07	0.000141054 2.3176E-07	0.00012977 2.52E-07 8.59E-09 7.59E-09 30.15923	52.14908959	0.167571316	1303.72724 43.22813
San Francisco Bay Area	2020 ConstMin - Rough Terrain Forklifts	Aggregated	50 Diesel	0.000215235	0.000260434	0.000867262	0.000309938	0.001236495	0.001167497	0.00388784 0.156258	0.520349451 7.8425E-05	0.000261161 7.2151E-05	0.000240268 7.84E-05 1.44E-06 1.28E-06 5069.62	4632.670915	17.25984552	219214.9508 43.2409
San Francisco Bay Area	2020 ConstMin - Rough Terrain Forklifts	Aggregated	75 Diesel	4 85291F-05	5 87202E-05	0 001202488	6 98819E-05	0 000227856	0 000344636	0 007057545 0 024658	0 504947417 2 7817E-05	0 000569638 2 5591E-05	0 000524067 2 78E-05 2 27E-07 2 01E-07 799 9926	654 9477058	2 681141052	35647 54756 44 55984
San Francisco Bay Area	2020 ConstMin Bough Torrain Forklifts	Aggrogated	100 Diocol	0.002170729	0.002847471	0.000122274	0.004579900	0.093250776	0.057070657	0.00107969 13.5000	0.469334115 0.00190697	6 E7EEE 0E 0 00174E12	6 040EE 0E 0 001807 0 00012E 0 00011 428214	2100EE 7097	701 0420291	21059557.02 49.04446
Sall Francisco Bay Area		Aggregateu	100 Diesei	0.003179728	0.003847471	0.000133374	0.004378809	0.082330770	0.037079037	0.00197808 13.3099	0.408324113 0.00189087	0.373332-03 0.00174312	0.04932-03 0.001897 0.000123 0.00011 438314	219055.7087	791.9420361	21038337.02 48.04440
San Francisco Bay Area	2020 Constivin - Rough Terrain Forklifts	Aggregated	175 Diesei	0.00155318	0.001879348	0.000276043	0.00223658	0.018380673	0.01/319//5	0.002543967 3.18573	0.467927069 0.00116204	0.000170684 0.00106908	0.00015/029 0.001162 2.94E-05 2.6E-05 103357.5	40095.36023	151.6520407	4969968.61 48.08523
San Francisco Bay Area	2020 ConstMin - Rough Terrain Forklifts	Aggregated	300 Diesel	3.79241E-05	4.58882E-05	9.71299E-05	5.46108E-05	0.000408734	0.000652331	0.001380765 0.220998	0.46777786 1.4888E-05	3.15138E-05 1.3697E-05	2.89927E-05 1.49E-05 2.04E-06 1.8E-06 7170.028	1640.172979	6.702852629	344882.3966 48.10056
San Francisco Bay Area	2020 ConstMin - Rough Terrain Forklifts	Aggregated	600 Diesel	1.18714E-05	1.43644E-05	8.1435E-05	1.70948E-05	0.000148258	0.000220965	0.001252704 0.082007	0.464914892 4.7147E-06	2.67289E-05 4.3376E-06	2.45906E-05 4.71E-06 7.58E-07 6.69E-07 2660.617	334.9504249	1.340570526	128765.261 48.39677
San Francisco Bay Area	2020 ConstMin - Rough Terrain Forklifts	Aggregated	750 Diesel	2.25975E-06	2.7343E-06	9.04033E-05	3.25404E-06	2.58894E-05	3.56653E-05	0.00117919 0.014137	0.467415149 2.5019E-07	8.2719E-06 2.3017E-07	7.61015E-06 2.5E-07 1.31E-07 1.15E-07 458.6668	35.32680262	0.167571316	22079.25164 48.13789
San Francisco Bay Area	2020 ConstMin - Rubber Tired Dozers	Aggregated	25 Diesel	0	0	0	0	0	0	0 0	0 0	0 0	0 0 0 0	0	0	0 0
San Francisco Day Area	2020 ConstMin Rubber Tired Dezers	Aggregated	EQ Diesel	0 000265258	0 000220002	0 001075779	0 000381073	0.001556200	0 001172000	0.002022014 0.152052	0 511651401 0 30565 05	0 000335306 8 03035 05		5251 775204	E CC41E080E	217708 2405 42 07500
Sall Francisco Bay Area	2020 Constituin - Rubber Tired Dozers	Aggregated	50 Diesei	0.000265258	0.000320963	0.001075778	0.000381972	0.001556209	0.0011/3609	0.003933614 0.152653	0.511651401 9.7056E-05	0.000325306 8.9292E-05	0.000299282 9.712-05 1.42-06 1.252-06 4952.665	5251.775204	5.004150805	21//98.3495 43.9/599
san Francisco Bay Area	2020 ConstMin - Rubber Tired Dozers	Aggregated	75 Diesel	0.000245407	0.000296942	0.001156824	0.000353386	0.001156682	0.002336059	0.009100797 0.118947	0.463392075 0.00018638	0.000726092 0.00017147	0.000668005 0.000186 1.09E-06 9.71E-07 3859.1	2667.26261	4.006350569	187381.7474 48.55581
San Francisco Bay Area	2020 ConstMin - Rubber Tired Dozers	Aggregated	100 Diesel	0.000774838	0.000937554	0.000749066	0.001115766	0.004729103	0.007349914	0.00587227 0.581331	0.464459138 0.0006452	0.000515489 0.00059359	0.00047425 0.000645 5.35E-06 4.74E-06 18860.66	10873.22878	12.43350177	913690.5567 48.44426
San Francisco Bay Area	2020 ConstMin - Rubber Tired Dozers	Aggregated	175 Diesel	0.000713873	0.000863786	0.000635263	0.001027977	0.004636942	0.008486369	0.00624122 0.625336	0.459897319 0.00048888	0.000359539 0.00044977	0.000330776 0.000489 5.76E-06 5.1E-06 20288.33	6708.606951	9.117901296	992602.4 48.92479
San Francisco Bav Area	2020 ConstMin - Rubber Tired Dozers	Aggregated	300 Diesel	0.000737153	0.000891956	0.000587045	0.001061501	0.004687809	0.009500898	0.006253062 0.698575	0.459770493 0.0004627	0.000304532 0.00042569	0.000280169 0.000463 6.44E-06 5.7E-06 22664.49	5076.258876	7.59825108	1109161.445 48.93828
San Francisco Bay Area	2020 ConstMin - Rubber Tired Dozers	Aggregated	600 Diesel	0.00632795	0.007656810	0.000456229	0.009112247	0.061087728	0.082254402	0.004901103 7 764466	0.462643331 0.00370149	0.000220551 0.00340526	0.000202907 0.003701 7 16E-05 6 34E-05 251909 6	33156 25163	46.55655662	12251468 89 48 62429
San Francisco Day Area	2020 ConstMin Rubber Tired Dozers	Aggregated	7E0 Dissel	8 20062F 0F	0.007050019	0.000-00223	0.000110205	0.001007720	0.002204402	0.0021/705/ 0.220500	0.460021073 4.22295 05	8 800220331 0.00340330	8 104525-05 A 225 05 2 045 05 4 95 05 7455 040	530 10/2472	0.553535002	20013 037 40 04403
San Francisco Bay Area	2020 Constivin - Rubber Tirea Dozers	Aggregated	750 Diesei	0.29003E-05	0.00010031/	0.000209224	0.000119382	0.000447094	0.001509347	0.00314/954 0.220566	0.400021072 4.2238E-05	0.0U920E-U5 3.8859E-U5	0.10432E-US 4.22E-US 2.04E-Ub 1.8E-Ub /156.019	538.1062472	0.552000079	330012.5337 48.91163
San Francisco Bay Area	2020 ConstMin - Rubber Tired Loaders	Aggregated	25 Diesel	0	0	0	0	0	0	0 0	0 0	0 0	0 0 0 0 0	0	0	0 0
San Francisco Bay Area	2020 ConstMin - Rubber Tired Loaders	Aggregated	50 Diesel	0.000996845	0.001206183	0.00118323	0.001435457	0.005513934	0.00428026	0.004198811 0.478162	0.469062796 0.00038629	0.000378939 0.00035539	0.000348624 0.000386 4.39E-06 3.9E-06 15513.43	17883.58577	21.31113843	744160.5667 47.9688
San Francisco Bay Area	2020 ConstMin - Rubber Tired Loaders	Aggregated	100 Diesel	0.010236674	0.012386376	0.000444331	0.014740811	0.08806492	0.104497206	0.003748582 11.61897	0.416802114 0.0081834	0.00029356 0.00752873	0.000270075 0.008183 0.000107 9.48E-05 376964.6	236987.0648	264.8052945	20349817.98 53.98336
San Francisco Bay Area	2020 ConstMin - Rubber Tired Loaders	Aggregated	175 Diesel	0.016403828	0.019848632	0.00030201	0.023621512	0 176485063	0 184338482	0.002804828 27.61694	0.420209509 0.01014661	0.000154387 0.00933488	0.000142036 0.010147 0.000255 0.000225 896001.3	319712 9438	347 3139588	47976942 94 53 54562
San Francisco Day Area	2020 ConstMin Rubber Tired Loaders	Aggregated	200 Diesel	0.017020846	0.0110040032	0.00030201	0.025021512	0.000541003	0.1040300402	0.002004020 27.01054	0.420205505 0.01014001	8 520705 05 0.00730400	7 82015 05 0.008225 0.000225 0.000225 0.000225	340027 1102	222.0800010	71740272.22 53.54502
Sall Francisco Bay Area	2020 Constituin - Rubber Tired Loaders	Aggregated	300 Diesei	0.01/930846	0.021696324	0.000220748	0.025820418	0.099541093	0.25226232	0.002566633 41.28611	0.42006391 0.00837466	8.52076E-05 0.00770469	7.8391E-05 0.008375 0.000381 0.000337 1339482	340837.1103	323.9869019	/1/482/3.32 53.50418
San Francisco Bay Area	2020 ConstMin - Rubber Fired Loaders	Aggregated	600 Diesel	0.024351523	0.029465343	0.000240508	0.035066194	0.157753539	0.307461685	0.002509621 51.29391	0.418680728 0.01156509	9.43987E-05 0.01063988	8.68468E-05 0.011565 0.000474 0.000419 1664175	268494.2282	284.9644795	89434632.3 53.74114
San Francisco Bay Area	2020 ConstMin - Rubber Tired Loaders	Aggregated	750 Diesel	0.001647558	0.001993545	0.000220247	0.002372484	0.013110593	0.021364035	0.002360304 3.798784	0.419690585 0.00075806	8.3751E-05 0.00069742	7.70509E-05 0.000758 3.51E-05 3.1E-05 123247.4	9992.379668	11.66352847	6607516.414 53.61183
San Francisco Bay Area	2020 ConstMin - Rubber Tired Loaders	Aggregated	9999 Diesel	0.001595627	0.001930709	0.000228034	0.002297703	0.007879407	0.033416524	0.003946787 3.563233	0.420849369 0.00084487	9.97866E-05 0.00077728	9.18037E-05 0.000845 3.29E-05 2.91E-05 115605.2	6466.866773	5.615772966	6180739.134 53.46421
San Francisco Bay Area	2020 ConstMin - Scrapers	Aggregated	25 Diesel	6.83587E-06	8.2714E-06	0.004224622	9.84365E-06	2.32276E-05	1.57772E-05	0.008058219 0.001222	0.624240817 2.1989E-06	0.001123074 2.023E-06	0.001033228 2.2E-06 1.11E-08 9.98E-09 39.65302	57,17074879	0.142373293	1429.26872 36.04439
San Francisco Bay Area	2020 ConstMin - Scrapers	Aggregated	50 Diesel	4 586755-05	5 54007E-05	0.002501021	6 60492E-05	0.000156622	0.000112512	0.007099257 0.009728	0.613804934 1.55146-05	0.000978906 1.42735-05	0.000000502 1 555-05 8 865-08 7 945-08 215 6076	208 7171624	0.854220761	11560 20506 26 65721
San Francisco Bay Area	2020 Constituin - Scrapers	Aggregateu	30 Diesel	4.36073E-03	3.345572-03	0.003301921	0.00492E-03	0.000130022	0.000112312	0.007033237 0.003728	0.013804934 1.3314E-03	0.000978900 1.42732-03	0.000900393 1.332-03 8.802-08 7.942-08 313.0070	296.7171024	0.034239701	11309.29300 30.03721
San Francisco Bay Area	2020 ConstMin - Scrapers	Aggregated	75 Diesel	0.000151632	0.000183474	0.00124715	0.00021835	0.000/16226	0.001403052	0.009537115 0.082742	0.562430784 0.00012261	0.000833435 0.0001128	0.000/66/6 0.000123 /.6E-0/ 6./5E-0/ 2684.4/1	1587.75874	3.844078924	10/393.8/53 40.0056
San Francisco Bay Area	2020 ConstMin - Scrapers	Aggregated	100 Diesel	0.00038126	0.000461325	0.000639276	0.000549014	0.003094797	0.00472668	0.006549952 0.406477	0.563271542 0.00034775	0.000481885 0.00031993	0.000443335 0.000348 3.75E-06 3.32E-06 13187.7	5815.05919	10.25087713	526794.1905 39.94588
San Francisco Bay Area	2020 ConstMin - Scrapers	Aggregated	175 Diesel	0.003890751	0.004707809	0.000501947	0.005602682	0.034554677	0.047994954	0.005117223 5.284197	0.563401191 0.00258134	0.000275222 0.00237483	0.000253205 0.002581 4.87E-05 4.31E-05 171439.9	40825.94933	92.68501406	6846743.882 39.93669
San Francisco Bay Area	2020 ConstMin - Scrapers	Aggregated	300 Diesel	0.004264243	0.005159733	0.000475828	0.006140509	0.02387475	0.058845862	0.005426739 6.066051	0.559408554 0.00258117	0.000238034 0.00237467	0.000218991 0.002581 5.6E-05 4.95E-05 196806.4	35295.79104	89.6951749	7915891.463 40.22173
San Francisco Bay Area	2020 ConstMin - Scrapers		600 Diesel	0.035172238	0.042558408	0.000314449	0.050648022	0 30541343	0 501785106	0.003707518 76.08493	0 562165467 0 01913307	0.000141368 0.01760242	0.000130058 0.019133 0.000702 0.000621 2468492	234205 5307	499 8726334	98800087 5 40 02448
San Francisco Day Area	2020 ConstMin Scrapers	Aggregated	750 Diesel	0.001012208	0.042558408	0.000314445	0.000048022	0.30341343	0.001780100	0.003707318 70.08433	0.502105407 0.01915507	0.000141308 0.01700242		254205.5507	433.8720334	1500512 (7 20 00227
San Francisco Bay Area	2020 Constivin - Scrapers	Aggregated	750 Diesei	0.001318085	0.001594883	0.000732466	0.001898043	0.015029264	0.021870803	0.010044384 1.228122	0.564027125 0.00089063	0.000409031 0.00081938	0.0003/6308 0.000891 1.13E-05 1E-05 39845.06	2554.579625	6.691544794	1589513.67 39.89237
San Francisco Bay Area	2020 ConstMin - Scrapers	Aggregated	9999 Diesel	0.001925028	0.002329284	0.000741965	0.002772041	0.023334121	0.029482604	0.009391326 1.761673	0.561159601 0.00123197	0.000392429 0.00113341	0.000361035 0.001232 1.62E-05 1.44E-05 57155.54	1434.826987	3.701705631	2291721.227 40.09622
San Francisco Bay Area	2020 ConstMin - Skid Steer Loaders	Aggregated	25 Diesel	0	0	0	0	0	0	0 0	0 0	0 0	0 0 0 0 0	0	0	0 0
San Francisco Bay Area	2020 ConstMin - Skid Steer Loaders	Aggregated	50 Diesel	0.00160124	0.0019375	0.000356068	0.002305785	0.016601738	0.01628046	0.002991973 2.603772	0.478513185 0.00063824	0.000117293 0.00058718	0.00010791 0.000638 2.4E-05 2.13E-05 84476.51	91151.69614	296.4905246	3972207.003 47.02144
San Francisco Bay Area	2020 ConstMin - Skid Steer Loaders		75 Diesel	0.003985146	0.004822027	0.000152864	0.005738611	0.083904759	0.063872596	0.002024838 13.52586	0.42878583 0.00272935	8 65236E-05 0 002511	7 96017E-05 0 002729 0 000125 0 00011 438831 5	326805 4403	937 8331914	23027519.99 52.47463
San Francisco Day Area	2020 Constituin Skid Steer Londers	Aggregated	100 Diesel	0.003303140	0.0004022027	0.000152004	0.0007300011	0.003504755	0.001648335	0.002024030 13.52500	0.42070505 0.00272555	0.000160217 0.82055.05		620003.4405	18 06245705	497202 222 52.47405
San Francisco Bay Area	2020 Constituin - Skid Steer Loaders	Aggregated	100 Diesei	8.75462E-05	0.000105931	0.000158689	0.000126067	0.001825087	0.001048335	0.002469273 0.283065	0.424043039 0.00010695	0.000160217 9.8395E-05	0.0001474 0.000107 2.012-06 2.312-06 9183.736	0384.255445	18.90245795	48/303.223 53.00154
San Francisco Bay Area	2020 ConstMin - Skid Steer Loaders	Aggregated	175 Diesel	2.2621E-05	2.73714E-05	0.000125399	3.25742E-05	0.000503304	0.000302741	0.001386968 0.093335	0.427603182 1.2733E-05	5.83366E-05 1.1715E-05	5.36697E-05 1.27E-05 8.62E-07 7.62E-07 3028.156	1046.744401	3.968886547	159340.8469 52.61976
San Francisco Bay Area	2020 ConstMin - Skid Steer Loaders	Aggregated	300 Diesel	1.3175E-05	1.59418E-05	7.88382E-05	1.89721E-05	0.000159285	0.000201269	0.000995352 0.086692	0.428723544 5.708E-06	2.82281E-05 5.2513E-06	2.59698E-05 5.71E-06 8.01E-07 7.08E-07 2812.622	720.1286672	2.498928567	147612.7678 52.48226
San Francisco Bay Area	2020 ConstMin - Skid Steer Loaders	Aggregated	600 Diesel	6.02229E-06	7.28697E-06	0.000124762	8.6721E-06	4.67988E-05	9.82365E-05	0.001681929 0.025079	0.429385142 4.218E-06	7.22176E-05 3.8806E-06	6.64402E-05 4.22E-06 2.32E-07 2.05E-07 813.664	90.18004712	0.293991596	42637.12628 52.40139
San Francisco Bay Area	2020 ConstMin - Skid Steer Loaders	Aggregated	9999 Diesel	1.53854E-05	1.86163E-05	0.000234798	2.2155E-05	0.000106534	0.000282989	0.003569197 0.033948	0.428168753 9.2858E-06	0.000117117 8.5429E-06	0.000107748 9.29E-06 3.13E-07 2.77E-07 1101.406	57.87919388	0.293991596	57879.19388 52.55026
San Francisco Bay Area	2020 ConstMin - Surfacing Equipment	Aggregated	25 Diesel	0	0	0	0	0	0	0 0	0 0	0 0	0 0 0 0	0	0	0 0
San Francisco Day Area	2020 Constituin - Surfacing Equipment	Aggregated	20 Diesel	4 7000 45 05	2 45 45 75 05	0 000050700	2 564425 05	0 0004 50007	0 0001 705 26	0 000701770 0 001007	0 20450525 0 20505 05	0 000142520 0 00045 00		4220 22524	5 200067422	44500 53360 53 03 436
Sall Francisco Bay Area	2020 Constituin - Surfacing Equipment	Aggregated	50 Diesei	1.78004E-05	2.15457E-05	0.000352736	2.50412E-05	0.000158237	0.000170526	0.002/91//9 0.02409/	0.39450635 8.7059E-06	0.000142529 8.0094E-06	0.00013112/ 8./12-06 2.222-0/ 1.9/2-0/ /81.8026	1238.33534	5.200867433	44589.53208 57.03420
San Francisco Bay Area	2020 ConstMin - Surfacing Equipment	Aggregated	75 Diesel	1.5088E-05	1.82565E-05	0.000349881	2.1/268E-05	0.000128759	0.00021452	0.004111222 0.018361	0.3518891/1 1.3395E-05	0.000256/12 1.2323E-05	0.000236175 1.34E-05 1.69E-07 1.5E-07 595.7125	572.8323598	2.26/044778	38090.84798 63.94166
San Francisco Bay Area	2020 ConstMin - Surfacing Equipment	Aggregated	100 Diesel	6.70705E-05	8.11553E-05	0.000205898	9.65816E-05	0.000896007	0.000881703	0.002236958 0.138361	0.351033473 4.978E-05	0.000126298 4.5798E-05	0.000116194 4.98E-05 1.28E-06 1.13E-06 4488.961	3204.053241	12.13535734	287731.3371 64.09753
San Francisco Bay Area	2020 ConstMin - Surfacing Equipment	Aggregated	175 Diesel	6.20872E-05	7.51256E-05	0.000203242	8.94056E-05	0.000744798	0.000872252	0.002359753 0.129516	0.350386901 4.2718E-05	0.000115568 3.9301E-05	0.000106322 4.27E-05 1.2E-06 1.06E-06 4202	1989.071492	7.867978937	269834.8375 64.21581
San Francisco Bay Area	2020 ConstMin - Surfacing Equipment	Aggregated	300 Diesel	9.08998E-05	0.000109989	0.000150818	0.000130896	0.000692338	0.001661466	0.002278217 0.255947	0.350956498 5.3652E-05	7.35677E-05 4.936E-05	6.76823E-05 5.37E-05 2.36E-06 2.09E-06 8303.907	2334.764144	9.73495699	532376.6979 64.11159
San Francisco Bay Area	2020 ConstMin - Surfacing Equipment	Aggregated		0.000162876	0 00019709	8 5159F-05	0 000234542	0.001667926	0.002465007	0.001065139 0.811461	0 350635687 8 86716-05	3 83153F-05 8 1578F-05	3 525E-05 8 87E-05 7 5E-06 6 62E-06 26226 97	4157 831762	14 80246885	1689408 431 64 17025
San Francisco Day Area	2020 ConstMin - Surfacing Equipment	Aggregated	750 Diesel	0 975525 05	0.000110404	0.000104766	0.000143307	0.000775037	0.001010710	0.00150/5/7 0.0011401	0 250811715 6 41275 05	5 62222E_0E E 0007E 0F	5 17254E-05 6 41E-05 2 7E 06 2 37E 06 10021 77	1200 120050	1 667/10100	22767E 10E7 64 17025
San Francisco Bay Area	2020 Constituin - Surfacing Equipment	Aggregated	750 Diesei	5.0/352E-U5	0.000119494	0.000104700	3.00014220/	0.000//503/	0.001818/13	0.001054047 0.40013	0.350611/15 0.412/E-05	3.02232E-03 3.8997E-05	5.17254E-05 0.41E-05 5.7E-00 5.27E-00 12981.77	1203.123023	4.00/445152	052025.1652 04.13805
San Francisco Bay Area	2020 Constitin - Surfacing Equipment	Aggregated	9999 Diesel	5.08827E-05	6.15681E-05	0.000162601	7.32/11E-05	0.00028948	0.001205707	0.003184259 0.132814	0.350759368 2.8786E-05	7.60225E-05 2.6483E-05	0.9940/E-05 2.88E-05 1.23E-06 1.08E-06 4308.993	315.4966074	1.200200177	276411.6203 64.14762
San Francisco Bay Area	2020 ConstMin - Sweepers/Scrubbers	Aggregated	25 Diesel	2.38754E-05	2.88892E-05	0.004077823	3.43805E-05	7.93853E-05	5.46631E-05	0.007715918 0.004177	0.589619253 7.5151E-06	0.001060787 6.9139E-06	0.000975924 7.52E-06 3.79E-08 3.41E-08 135.5226	206.8663251	0.282711264	5171.658127 38.16086
San Francisco Bay Area	2020 ConstMin - Sweepers/Scrubbers	Aggregated	50 Diesel	0.002974091	0.00359865	0.001340324	0.004282691	0.016537214	0.013699778	0.005102506 1.582094	0.589253567 0.00124222	0.000462666 0.00114284	0.000425653 0.001242 1.45E-05 1.29E-05 51329.29	54925.53207	79.58322075	1959985.384 38.18454
San Francisco Bav Area	2020 ConstMin - Sweepers/Scrubbers	Aggregated	75 Diesel	0.000464421	0.000561949	0.000695066	0.000668766	0.003270574	0.004627568	0.005723767 0.430242	0.532159084 0.00037284	0.000461156 0.00034301	0.000424264 0.000373 3.96E-06 3.51E-06 13958.71	8145.99224	14.27691882	590192.5415 42.2813
San Francisco Bay Area	2020 ConstMin - Sweepers/Scrubbers	Aggregated		0.001522001	0.001841621	0 00048286	0.002191681	0 014423500	0.016092521	0 004219347 2 021202	0 529995024 0 00129171	0.000338678 0.00118939	0.000311584 0.001292 1.865-05 1.655-05 65581.86	35101 24149	50 74667185	2784208 395 42 45204
San Francisco Day Area	2020 ConstMin Sweepers/Scrubbers	Agenced	17E Dissel	0.0001022001	0.000533347	0.000462559	0.000634737	0.002001505	0.00522407	0.004619115 0.041535	0.520350524 0.001231/1	0.000337590 0.000110030		53131.24140	7 40104040	0/1710 00/7 /0 /2/07
San Francisco Bay Area	2020 Constituint - Sweepersy Scrubbers	Aggregated	T12 Diesei	0.000440783	0.00053334/	0.000402558	0.000034/2/	0.00361565	0.0053248/	0.004018115 0.011535	0.00002102 0.00027395	0.000257589 0.00025203	0.000210302 0.0002/4 5.04E-00 4.99E-06 19840.6	3200.201029	7.49184849	041/18.894/ 42.4240/
San Francisco Bay Area	2020 ConstMin - Sweepers/Scrubbers	Aggregated	300 Diesel	0.000128238	0.000155168	0.000224084	0.000184662	0.000791546	0.001923036	0.002///136 0.367255	0.530368183 6.1751E-05	8.91776E-05 5.6811E-05	8.20434E-05 6.18E-05 3.39E-06 3E-06 11915.18	2410.497239	3.392535165	505490.4791 42.42407
San Francisco Bay Area	2020 ConstMin - Sweepers/Scrubbers	Aggregated	600 Diesel	3.99203E-05	4.83035E-05	0.000516533	5.74852E-05	0.000657201	0.000554304	0.005927436 0.049597	0.530368299 2.7982E-05	0.000299224 2.5743E-05	0.000275286 2.8E-05 4.57E-07 4.05E-07 1609.131	206.8663251	0.282711264	68265.88728 42.42406
San Francisco Bay Area	2020 ConstMin - Sweepers/Scrubbers	Aggregated	9999 Diesel	2.43653E-05	2.9482E-05	0.000245372	3.50861E-05	0.000126881	0.000510551	0.004249195 0.063725	0.530368299 1.4487E-05	0.000120573 1.3328E-05	0.000110927 1.45E-05 5.88E-07 5.2E-07 2067.49	103.4331625	0.141355632	87711.32184 42.42406
San Francisco Bay Area	2020 ConstMin - Tractors/Loaders/Backhoes	Aggregated	25 Diesel	0	0	0	0	0	0	0 0	0 0	0 0	0 0 0 0 0	0	0	0 0
San Francisco Bay Area	2020 ConstMin - Tractors/Loaders/Backboos	Aggregated		0.006120808	0 007406177	0 000680877	0 008813963	0 044950389	0 039262771	0.003609572 5.151649	0 473610161 0 00256982	0 000236254 0 00236424	0.000217354 0.00257 4.745-05 4.25-05 167129.6	209462 1432	414 9476254	7940504 038 47 50822
San Francisco Day Area	2020 ConstMin Tractors /Loaders /Dackings	Agaragateu	JU Diesel	0.000120000	0.007400177	0.001200471	0.000013303	0.000000407	0.033202771	0.01025003072 0.017204	0.420016027 0.00156022	0.00023724 0.00230424	0.000756015 0.001560 7.55 00 0.055 00 20525 50	10227 5022	90 10///200	1202240 00 52 47.20823
Sali Francisco Bay Area	2020 Constivin - Tractors/Loaders/Backhoes	Aggregated	75 Diesel	0.002059392	0.002491864	0.0013064/1	0.002965524	0.008299437	0.01956537	0.010258019 0.81/891	0.428810037 0.00156922	0.000822/34 0.00144368	0.000/2012 0.001209 /.5E-Ub 6.68E-Ub 26535.58	19327.5933	oo.19444302	1392346.89 52.47094
San Francisco Bay Area	2020 ConstMin - Tractors/Loaders/Backhoes	Aggregated	100 Diesel	0.040491891	0.048995188	0.000257282	0.058308323	0.551957409	0.497793973	0.002614 81.86261	0.4298743 0.03114618	0.000163554 0.02865448	0.000150469 0.031146 0.000756 0.000668 2655942	1672131.461	2729.256559	139016704.9 52.34176
San Francisco Bay Area	2020 ConstMin - Tractors/Loaders/Backhoes	Aggregated	175 Diesel	0.00555162	0.006717461	0.000200187	0.007994333	0.084963566	0.066069972	0.001968954 14.30872	0.426414835 0.00332886	9.92034E-05 0.00306255	9.12671E-05 0.003329 0.000132 0.000117 464230.8	170843.565	315.186698	24495788.65 52.76641
San Francisco Bay Area	2020 ConstMin - Tractors/Loaders/Backhoes	Aggregated	300 Diesel	0.003159163	0.003822587	0.000184889	0.004549194	0.020823249	0.046242012	0.002236612 8.849741	0.428040185 0.00154374	7.46669E-05 0.00142024	6.86935E-05 0.001544 8.17E-05 7.22E-05 287120.1	72700.30209	132.0025024	15092768.06 52.56604
San Francisco Bav Area	2020 ConstMin - Tractors/Loaders/Backhoes	Aggregated	600 Diesel	0.003765085	0.004555752	0.000164414	0.005421722	0.030975331	0.049672993	0.001792666 11.7727	0.424869237 0.00175504	6.33384E-05 0.00161464	5.82713E-05 0.001755 0.000109 9.61E-05 381952.3	60090.90449	114.2190328	20227568.89 52.95836
San Francisco Bay Area	2020 ConstMin - Tractors / Loaders / Backhoos	Aggregated	750 Diesel	8 565685-05	0.000102645	0 000110274	0 000122246	0 000800436	0 000953937	0.00101495 0.20919	0 423646814 2 62065-05	2 7988F-05 2 4201F-05	2 5749F-05 2 63F-05 3 68F-06 2 25F-06 12019 F	1080 188074	1 590391595	686116 4724 52 11117
Can Francisco Day Ared	2020 Constituin - Hactors/Loaders/Datkilles	Aggregated	100 Diesei	0.0011002-00	0.000103045	0.000110274	0.000123340	0.000000450	0.000933337	0.00101433 0.33818	0.420044200 0.000505	2.7300L-03 2.4201E-03	2.57+9L-05 2.05L-05 5.06E-00 5.25E-00 12918.5	1000.1000/4	1.330331333	000110.4/24 55.1111/
san Francisco Bay Area	2020 Constivin - Tractors/Loaders/Backhoes	Aggregated	aaaa Diesel	0.001106269	0.001338586	0.00014274	0.001593028	0.007891861	0.025920924	0.002/64081 4.023481	0.429044398 0.0005261	5.61009E-05 0.00048401	5.10128E-U5 U.UUU526 3.72E-U5 3.28E-U5 130537.4	3699.700598	b.u/2404274	6845773.63 52.44301
San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	25 Diesel	0	0	0	0	0	0	0 0	0 0	0 0	0 0 0 0 0	0	0	0 0
San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	50 Diesel	0.002310824	0.002796097	0.000999442	0.003327587	0.014933957	0.014450091	0.005165065 1.821794	0.651185317 0.00110024	0.00039327 0.00101222	0.000361808 0.0011 1.68E-05 1.49E-05 59106.11	51190.43819	136.0652475	2042290.903 34.55296
San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	75 Diesel	0.000180363	0.000218239	0.001053356	0.000259722	0.001035163	0.001824789	0.008807559 0.121587	0.586856379 0.00012523	0.000604434 0.00011521	0.000556079 0.000125 1.12E-06 9.92E-07 3944.772	2142.391895	8.194838768	151244.6238 38.34052
San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	100 Diesel	0.001072375	0.001297574	0.000634097	0.00154422	0.008485269	0.01188563	0.005808257 1.19855	0.585705972 0.00090126	0.000440426 0.00082916	0.000405192 0.000901 1.1E-05 9.78E-06 38885.62	17805.89471	54.88995779	1493823.309 38.41583
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San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	175 Diesel	0.000179153	0.000216775 0.000468624	0.00025798	0.001715551	0.002298143	0.004968114 0.269564	0.582741607 0.0001175	0.000254022 0.0001081	0.0002337 0.00011	8 2.49E-06 2.2E-06	8745.699 2359.873	8.349458367	337682.3204 38.61124
San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	300 Diesel	0.000357354	0.000432398 0.000387425	0.00051459	0.002038247	0.005299349	0.004748166 0.654464	0.586393427 0.00021352	0.000191308 0.00019643	0.000176003 0.000214	4 6.04E-06 5.34E-06	21233.36 3560.420	11.59646995	814740.7177 38.37079
San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	600 Diesel	0.000301747	0.000365114 0.000243947	0.000434516	0.003079868	0.00428087	0.002860219 0.878508	0.586965997 0.00016092	0.00010752 0.00014805	9.89179E-05 0.00016	1 8.11E-06 7.17E-06	28502.23 2812.428	7.885599569	1092586.161 38.33336
San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	750 Diesel	3.31884E-05	4.0158E-05 8.19552E-05	4.77913E-05	0.000517089	0.00033812	0.000690042 0.286764	0.585234803 4.9334E-06	1.00682E-05 4.5387E-06	9.26271E-06 4.93E-0	6 2.65E-06 2.34E-06	9303.757 553.10	43 1.236956795	357699.2491 38.44675
San Francisco Bay Area	2020 ConstMin - Trenchers	Aggregated	9999 Diesel	4.31127E-05	5.21664E-05 0.001283742	6.20823E-05	0.0006192	0.000598555	0.014729614 0.02377	0.584956092 2.7638E-05	0.000680139 2.5427E-05	0.000625728 2.76E-0	5 2.18E-07 1.94E-07	771.204 34.49350	0.154619599	29664.41845 38.46507
San Francisco Bay Area	2020 OFF - ConstMin - Bore/Drill Rigs	Aggregated	25 Diesel	0.000166298	0.000197908 0.000930873	0.000239469	0.000892926	0.001510908	0.007106646 0.199745	0.939513432 5.6873E-05	0.000267506 5.2323E-05	0.000246105 5.69E-0	5 2.64E-06 1.67E-06	6624.75 10011	.95 12.34	155201.65 23.42755
San Francisco Bay Area	2020 OFF - ConstMin - Cement and Mortar Mixers	Aggregated	25 Diesel	0.000421258	0.000501332 0.000687821	0.000606612	0.002930536	0.003783187	0.005190482 0.511569	0.701865939 0.00015035	0.000206274 0.00013832	0.000189772 0.0001	5 7.67E-06 4.28E-06	17019.95 5155	9.9 171.7	532075.1 31.26185
San Francisco Bay Area	2020 OFF - ConstMin - Concrete/Industrial Saws	Aggregated	25 Diesel	1.38071E-05	1.64316E-05 0.000922086	1.98822E-05	6.78606E-05	0.00012564	0.007050485 0.016481	0.924851567 4.6946E-06	0.000263444 4.319E-06	0.000242368 4.69E-0	6 2.09E-07 1.34E-07	532.9 72	2.7 1.2	13008.6 24.41096
San Francisco Bay Area	2020 OFF - ConstMin - Concrete/Industrial Saws	Aggregated	50 Diesel	0.000252517	0.000300517 0.001064472	0.000363625	0.002074878	0.001912874	0.006775672 0.259021	0.917490448 9.6627E-05	0.000342265 8.8896E-05	0.000314884 9.66E-0	5 3.35E-06 2.18E-06	8661.45 6245	.15 10.74	206089.95 23.79393
San Francisco Bay Area	2020 OFF - ConstMin - Dumpers/Tenders	Aggregated	25 Diesel	4.28841E-05	5.10357E-05 0.000474309	6.17532E-05	0.000210675	0.00039044	0.003628625 0.051165	0.475513895 1.4879E-05	0.000138279 1.3689E-05	0.000127217 1.49E-0	5 6.49E-07 4.23E-07	1682.65 4909	.25 7.37	78548 46.68113
San Francisco Bay Area	2020 OFF - ConstMin - Excavators	Aggregated	25 Diesel	0.000300479	0.000357595 0.000712051	0.00043269	0.001476831	0.002734257	0.005444505 0.358668	0.714186141 0.00010217	0.000203436 9.3993E-05	0.000187161 0.00010	2 4.55E-06 3E-06	11924.55 15939	.55 11.36	366609.65 30.74411
San Francisco Bay Area	2020 OFF - ConstMin - Other Construction Equipment	Aggregated	25 Diesel	0.000968898	0.001153068 0.000752211	0.001395213	0.006841638	0.008752139	0.005709512 1.190738	0.776785189 0.00033915	0.000221246 0.00031202	0.000203546 0.00033	9 1.79E-05 9.99E-06	39693.75 82406	.05 119.33	1119020.65 28.19136
San Francisco Bay Area	2020 OFF - ConstMin - Pavers	Aggregated	25 Diesel	8.14285E-05	9.69066E-05 0.000776495	0.000117257	0.000399649	0.000742199	0.005947108 0.09706	0.777723851 2.8651E-05	0.000229572 2.6359E-05	0.000211206 2.87E-0	5 1.23E-06 8.08E-07	3212 3	96 4.6	91104 28.36364
San Francisco Bay Area	2020 OFF - ConstMin - Paving Equipment	Aggregated	25 Diesel	9.63124E-05	0.00011462 0.000662561	0.00013869	0.000473367	0.000876409	0.005066095 0.114964	0.66454816 3.273E-05	0.000189198 3.0112E-05	0.000174062 3.27E-0	5 1.46E-06 9.6E-07	3817.9 6646	.65 7.97	126286.35 33.07744
San Francisco Bay Area	2020 OFF - ConstMin - Plate Compactors	Aggregated	25 Diesel	0.000284563	0.000338654 0.000518326	0.000409771	0.002149414	0.00256614	0.003927605 0.352021	0.538785254 0.00010027	0.000153473 9.2251E-05	0.000141195 0.000	1 5.48E-06 2.95E-06	11716.5 5961	9.1 99.33	476952.8 40.70779
San Francisco Bay Area	2020 OFF - ConstMin - Rollers	Aggregated	25 Diesel	0.001737548	0.002067825 0.000686407	0.002502069	0.010933962	0.015736831	0.005223784 2.113412	0.701539302 0.00060186	0.000199784 0.00055371	0.000183802 0.000603	2 3E-05 1.77E-05	70372 184043	.95 264.59	2199150.55 31.25036
San Francisco Bay Area	2020 OFF - ConstMin - Rubber Tired Loaders	Aggregated	25 Diesel	8.02599E-05	9.55159E-05 0.000674429	0.000115574	0.000394471	0.000730337	0.005156837 0.095802	0.676451269 2.7289E-05	0.000192687 2.5106E-05	0.000177272 2.73E-0	5 1.22E-06 8.04E-07	3197.4 4135	.45 4.25	103386.25 32.33447
San Francisco Bay Area	2020 OFF - ConstMin - Signal Boards	Aggregated	25 Diesel	0.004447517	0.005292913 0.00098835	0.006404425	0.033593811	0.04010694	0.007489205 5.501833	1.027362288 0.00156719	0.000292644 0.00144182	0.000269232 0.00156	7 8.56E-05 4.62E-05	183449 65156	1.5 867.99	3909369 21.31039
San Francisco Bay Area	2020 OFF - ConstMin - Signal Boards	Aggregated	50 Diesel	0.000110301	0.000131267 0.001131659	0.000158833	0.000896126	0.000832547	0.00717744 0.114493	0.987055371 4.1501E-05	0.00035778 3.8181E-05	0.000329158 4.15E-0	5 1.48E-06 9.56E-07	3799.65 2288	.55 4.33	84676.35 22.2853
San Francisco Bay Area	2020 OFF - ConstMin - Skid Steer Loaders	Aggregated	25 Diesel	0.008039661	0.009567861 0.000706715	0.011577111	0.038868109	0.072352115	0.005344175 9.329592	0.689115604 0.00294277	0.000217363 0.00270735	0.000199974 0.002943	3 0.000118 7.8E-05	310235.4 494155	.25 592.07	9883105 31.85679
San Francisco Bay Area	2020 OFF - ConstMin - Tractors/Loaders/Backhoes	Aggregated	25 Diesel	0.00149113	0.001774568 0.000686861	0.002147228	0.007328775	0.01356876	0.005251901 1.77989	0.688921318 0.00051076	0.000197692 0.0004699	0.000181877 0.00051	1 2.26E-05 1.49E-05	59184.75 8200	0.9 86.95	1886020.7 31.86667
San Francisco Bay Area	2020 OFF - ConstMin - Trenchers	Aggregated	25 Diesel	0.00070264	0.000836199 0.000930444	0.001011801	0.003806856	0.006382814	0.007102196 0.844522	0.939704417 0.00024056	0.000267674 0.00022132	0.00024626 0.00024	1 1.12E-05 7.06E-06	28079.45 2936	7.9 47.44	656058.3 23.36436

EMFAC2014 (v1.0.7) Emission Rates Region Type: Air Basin Region: San Francisco Bay Area Calendar Year: 2020 Season: Annual Vehicle Classification: EMFAC2011 Categories Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	Calendar Yea	r Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips R	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	K ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	NOx_RUNEX	NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX C	O2_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
							miles/day	trips/day	g/mile	g/veh/day	g/trip	g/trip	g/trip	g/veh/day	g/veh/day	g/mile	g/veh/day	g/trip	g/mile	g/veh/day	g/trip	g/mile	g/veh/day	g/trip	g/mile	g/mile	g/mile	g/veh/day	g/trip	g/mile	g/mile
San Francisco Bay Area	2020	LDA	Aggregated	Aggregated	GAS	2639789.89	2 93944227	16611552	0.01265893	0	0.10978236	0.12580784	41 0.256845365	0.21158896	1 0.23670290	03 0.06134217	, c	0 0.10484743	3 279.280879	. 0	63.53770732	0.001762793	C	0.002417229	0.008000002	0.036750011	0.001620905	0	0.002222778	0.002000001	0.015750005
San Francisco Bay Area	2020	LDT1	Aggregated	Aggregated	GAS	210161.852	2 6961770.8	1283578	0.02694219	0	0.23342785	0.26558421	17 0.971493405	0.47359205	5 0.58039306	4 0.13270846	ic	0 0.19293273	3 328.339619) 0	74.25385691	0.0024183	C	0.003383209	0.008000002	0.036750011	0.002223951	0	0.003111573	0.002000001	0.015750005
San Francisco Bay Area	2020	LDT2	Aggregated	Aggregated	GAS	893709.529	6 33008227	5642099	0.01556707	0	0.12443148	0.12319369	96 0.421528853	0.24940084	1 0.25968841	1 0.08982633	: 0	0 0.1602032	2 373.416026	5 0 1	84.77643775	0.001692538	C	0.002259267	0.008000002	0.036750011	0.001556295	0	0.002077462	0.002000001	0.015750005
San Francisco Bay Area	2020	T7 single construction	Aggregated	Aggregated	DSL	894.371107	4 85141.045	6 0	0.10731584	0.70528994	0		0 0	1	0	0 4.14426745	25.2902209	9 C	1636.72131	4656.18255	0	0.019068605	0.013495901	0	0.03600001	0.061740018	0.018243706	0.012912074	0	0.009000003	0.026460008